July 4, 1933. J. E. CONNOLLY 1,916,416

METHOD OF MANUFACTURING SAFETY RAZOR BLADES

Filed Jan. 8, 1932

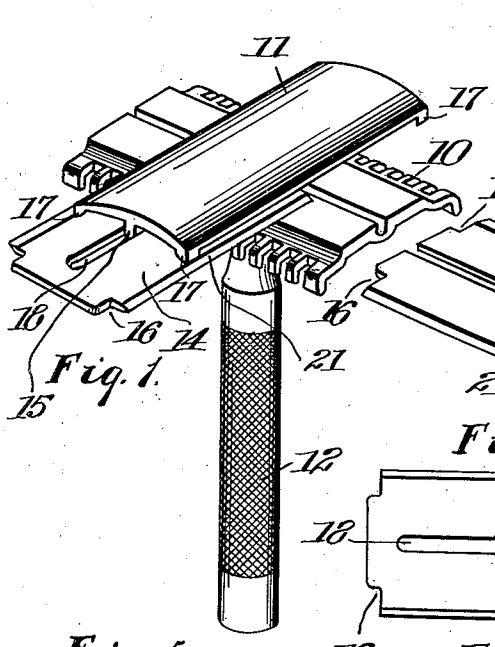



Fig. 1.

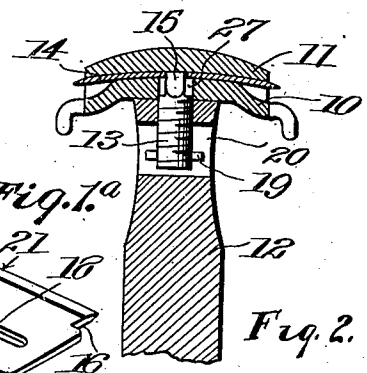



Fig. 1a. Fig. 2.




Fig. 4.

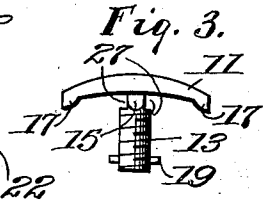



Fig. 3.

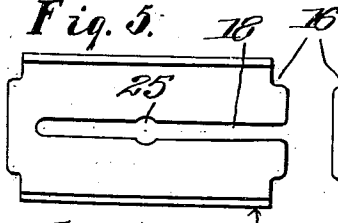



Fig. 5.

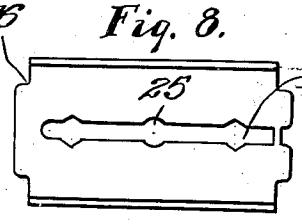



Fig. 8.

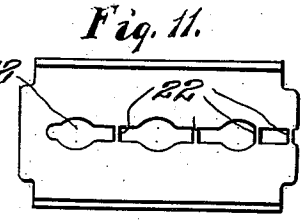



Fig. 11.

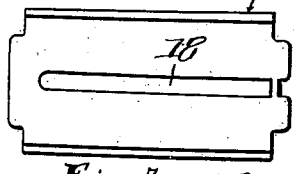



Fig. 6.

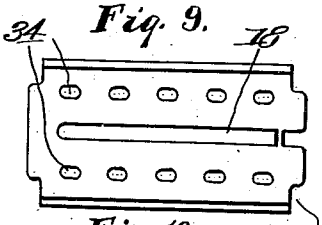



Fig. 9.

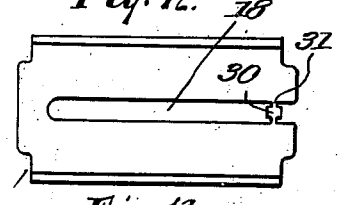



Fig. 12.

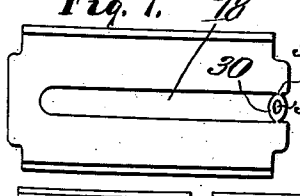



Fig. 7.

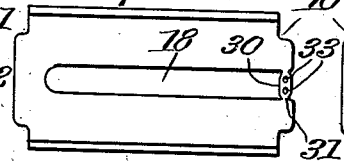



Fig. 10.

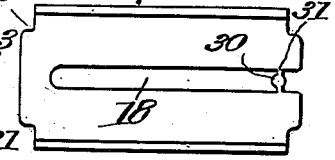



Fig. 13.

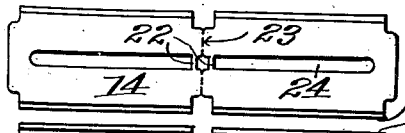



Fig. 14.

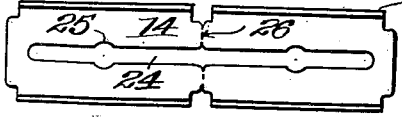



Fig. 15.

Inventor,
James E. Connolly,
by his attorneys,
Baldwin & Wight

Patented July 4, 1933 1,916,416

# UNITED STATES PATENT OFFICE

JAMES E. CONNOLLY, OF BALTIMORE, MARYLAND

## METHOD OF MANUFACTURING SAFETY RAZOR BLADES

Application filed January 8, 1932. Serial No. 585,590.

My invention relates to an inexpensive and expeditious method of manufacturing safety razor blades without distortion and with a sufficient degree of hardness and stability to enable them to be manufactured with an open end attaching slot, so that the blade may be applied to the razor and detached therefrom simply by lateral sliding movements.

The application and removal of safety razor blades is rendered more expeditious by the use of a blade produced according to the present invention, since it overcomes the necessity of completely detaching any parts of the razor to receive or release the blade.

The blades of the type with which the invention primarily deals are exceedingly thin and adapted to be used but once and then discarded. Because of said extreme thinness, many difficulties have been experienced in manufacturing the blades. The present novel method overcomes these difficulties since the end of the attaching slot of the blade which is to be open in use, is maintained closed until the final step in its manufacture. I, thereby, avoid warping, unevenness or other distortion which cannot be present in a practical and marketable blade.

Embodiments of the invention are illustrated in accompanying drawing, wherein:—

Figure 1 is a perspective view illustrating a razor about to receive a blade;

Figure 1ª is a perspective view of a razor blade constructed in accordance with the invention;

Figure 2 is a longitudinal sectional view through the razor and blade;

Figure 3 is an end elevation of a clamping plate employed for the razor;

Figures 4 to 13 are plan views, each of a different form of razor blade constructed in accordance with the invention;

Figure 14 is a plan view of a blank consisting of a pair of razor blades prior to severance and

Figure 15 is a plan view of a modified form of blank substantially like Figure 14.

The blade constructed according to the present invention, is adapted for use in well known types of safety razors which have a guard plate 10, a clamping plate 11 and a handle 12 which receives a screw-threaded shank 13, rigid with the clamp plate 11, and which handle 12 is turned in order to tightly secure the blade 14 in place, with its edges at the desired angle of cut. Blades of the type shown at 14 are made of very thin steel, hardened to the desired degree, and are adapted to be used but once and then discarded. Blades of the type referred to are also held in place by the passage of the shank 13 through a slot or slots of the blade, the slots also receiving ribs 15 located on opposite sides of the shank 13 and disposed longitudinally of the clamping plate. In addition, the corners of the blade are removed or notched as at 16 so that lugs 17 on the clamping plate may extend into the same.

In existing blades for a razor of the general type referred to, the attaching slot through which the shank 13 and ribs 15 pass, is closed at both ends of the blade. As a result, the attaching plate has to be completely detached from the guard plate in order to insert or remove a blade.

The present invention provides a blade in which the attaching slot, shown at 18, is open at one end of the blade 14. As a result, the attaching plate 11 does not have to be removed to receive or release a blade 14. By a sliding movement from either side of the plates, the blade may be applied to the razor since the open end of slot 18 will receive or release the shank 13. The blade is preferably inserted with the razor in the condition shown in Figure 1 where the plate 11 is temporarily disposed at a right angle to the guard plate 10. Since the clamping plate 11 does not have to be detached from the handle 12, a pin or the equivalent is provided at 19 on the shank to prevent detaching movement thereof and a slot or opening 20 is provided in the handle to afford clearance for movement of the pin as the handle and shank move relatively.

Because of the extreme thinness of the blade 14, much difficulty has been encountered in manufacturing the same so that the cutting edges 21 and the end portions where the slot 18 is open will not be uneven, warped or otherwise distorted, by the various steps

to which it is subjected. I find that the difficulty is overcome by providing one or more fins, burs or the like across the slot 18 adjacent the end thereof which is to remain open, subjecting the blade while the slot is thus closed, to the different steps of the method, and removing such fin or bur as the final step of the method.

In manufacturing, a blank of the general form shown in Figure 14 is cut or stamped from a sheet of relatively soft or untempered steel, which blank is of a size to provide two of the blades 14 since it is adapted to be cut or severed along a central transverse line 23. This blank has a slot 24 which crosses the line 23 and eventually forms the slots 18 for the individual blades. It will be noted that burs or fins 22 cross the slot 24 on opposite sides of the said line 23. With the blank in the form shown in Figure 14, its edges are ground off or sharpened roughly as at 21. Thereupon, the blank is subjected to a heat treatment to temper or harden the same. Next the edges 21 are honed, stropped or otherwise given a final sharpening. At this stage, the blades are severed by cutting the blank along the line 23. As the final step, each blade has the fin or bur 22 cut therefrom along the opposite lines or sides of the attaching slots.

The blades produced from the blank of Figure 14 will have the shape of the blade shown in Figure 1ª.

The blank of Figure 15 differs from that of Figure 14 in that the slots 24 have central enlargements at 25 whereby the blade may fit an ordinary safety razor in which it is incapable of being applied and removed by the lateral sliding movement. In addition, at the line of severance 26, the ends of the blade are preferably rounded so that the entrances to the slots 18 will be flared. The blank of Figure 15 provides a blade of the form disclosed in Figure 5. It is optional in this form of Figure 15 to employ or dispense with the fins, since the cutting at 26 is the last step of manufacture, the slot being closed up to this final stage and the blade being sufficiently stable. Also when the fins are dispensed with, the blank is hardened, tempered or heat treated before severance along line 26.

It will be realized that the shape of the slots 24 or equivalent in the different blanks of the general form of Figures 14 and 15 will vary according to the ultimate form of the razor blades, and, for instance, those suggested in Figures 1ª and 4 to 13.

In order to receive the blade 14, the shank of the commercial type of safety razor is cut away at the junction with the clamping plate 11, as at 27, to enable use of a slot like 18, of the same diameter throughout. In cases where the shank is not cut away as at 27, the blade of Figure 4 may be used since the slot 18, throughout a portion thereof, is enlarged as at 28 to receive the shank.

Figure 6 illustrates a blade in which the ends are of different shape to fit a different design of razor.

The various slots of the blades may be, obviously, of a shape to enable attachment to a razor wherein the shank 13 is cut away at 27 as well as to existing forms of safety razors.

Figure 11 particularly shows that a plurality of the fins or burs 22 may be used for each blade if desired.

Figures 7, 10, 12 and 13 shows different forms of fins, each having a larger central portion 30 and reduced end portions 31 connected along the side edges of the slots. Thus the fins decrease in width from the center to their ends, which is advantageous in guiding the cutter so as to sever them from the blades, truly along the sides of the slots, thus avoiding any shoulders or the like which might engage the shank 13 and hamper their insertion into a razor blade. It will be noted that the fins may be cut away as at 32 and 33 in the form of Figures 7 and 10.

Figure 9 shows that the blade may have longitudinal rows of perforations as at 34, to increase the flexibility thereof.

Various changes may be resorted to provided they fall within the spirit and scope of the invention.

I claim:—

1. The method of manufacturing a metallic razor blade consisting in forming a blade in an untempered condition substantially into the final shape with an attaching slot having a stabilizing fin across the slot adjacent an end, in thereafter hardening the blade, and in finally removing said fin.

2. The method of manufacturing a metallic razor blade consisting in forming the blade in an untempered condition substantially into its final shape with an attaching slot having stabilizing fins in spaced relation remaining across the slot, in thereafter hardening the blade and in finally removing said fins.

3. The method of manufacturing a metallic razor blade consisting in forming the blade in an untempered condition substantially into its final shape with an attaching slot having a stabilizing fin across the slot adjacent an end of less size at its junctions with the blade than intermediate said junctions, in thereafter tempering the blade, and in finally removing said fin along said junctions.

In testimony whereof, I have hereunto subscribed my name.

JAMES E. CONNOLLY.