United States Patent [19]

Iten

[11] **3,872,592**

[45] **Mar. 25, 1975**

[54] **TWIN BLADE INJECTOR UNIT**

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[73] Assignee: **Philip Morris Incorporated,** New York, N.Y.

[22] Filed: **Jan. 30, 1974**

[21] Appl. No.: **437,859**

[52] **U.S. Cl.** **30/346.58,** 30/50

[51] **Int. Cl.** **B26b 21/54,** B26b 21/22

[58] **Field of Search** 30/50, 346.57, 346.58, 30/346.59, 304, 305

[56] **References Cited**

UNITED STATES PATENTS

2,654,149	10/1953	Bowen	30/65 X
3,262,206	7/1966	Tomer	30/50 X
3,724,070	4/1973	Dorion	30/50 X

FOREIGN PATENTS OR APPLICATIONS

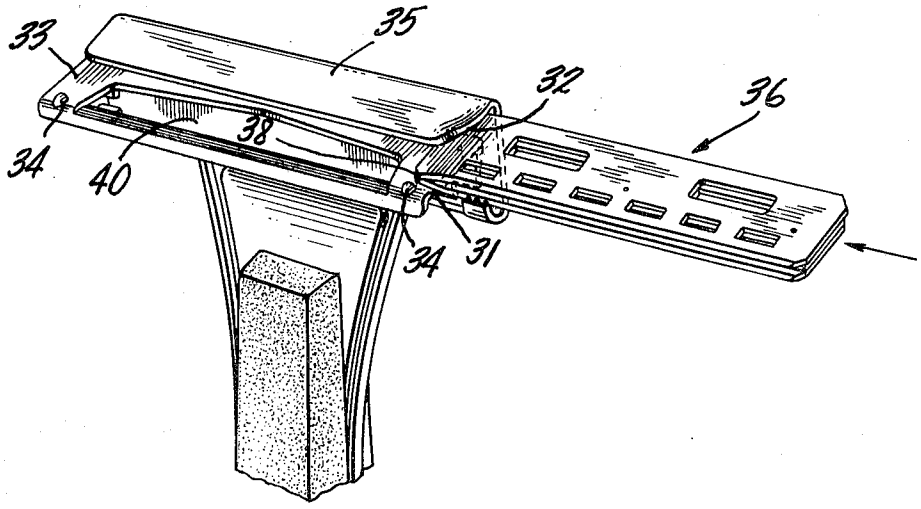
772,532	4/1957	United Kingdom	30/50

Primary Examiner—Al Lawrence Smith
Assistant Examiner—Gary L. Smith
Attorney, Agent, or Firm—Watson Leavenworth Kelton & Taggart

[57] **ABSTRACT**

A blade unit adapted to be inserted in a standard single cutting edge injector type safety razor, the unit comprising a pair of superposed blades with an intervening spacer all permanently secured together, the spacer terminating short of the advance end of the unit and the blades at that end being capable of flexing toward each other.

8 Claims, 5 Drawing Figures



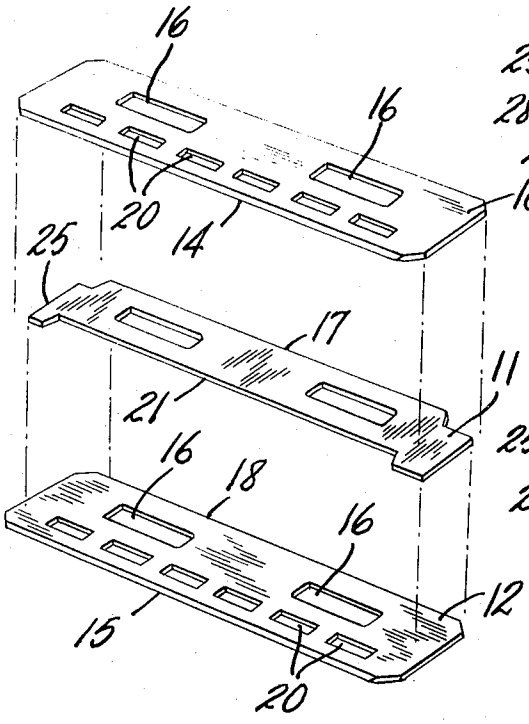


FIG. 1

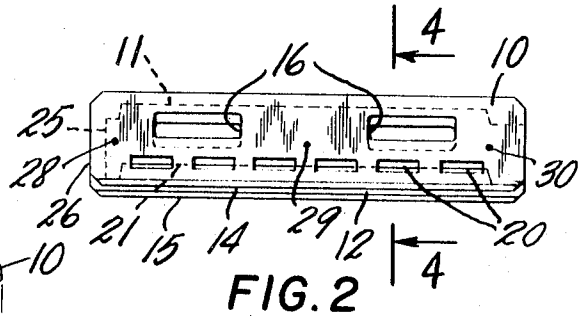


FIG. 2

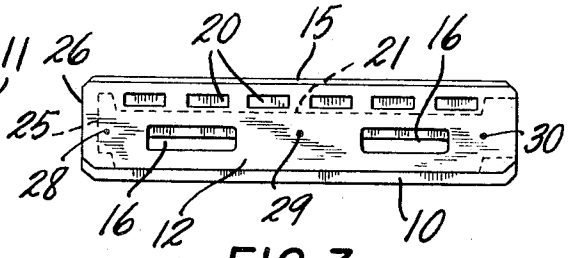


FIG. 3

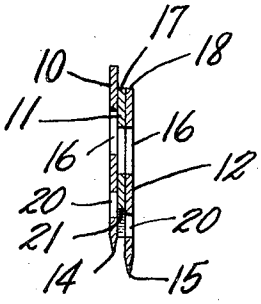


FIG. 4

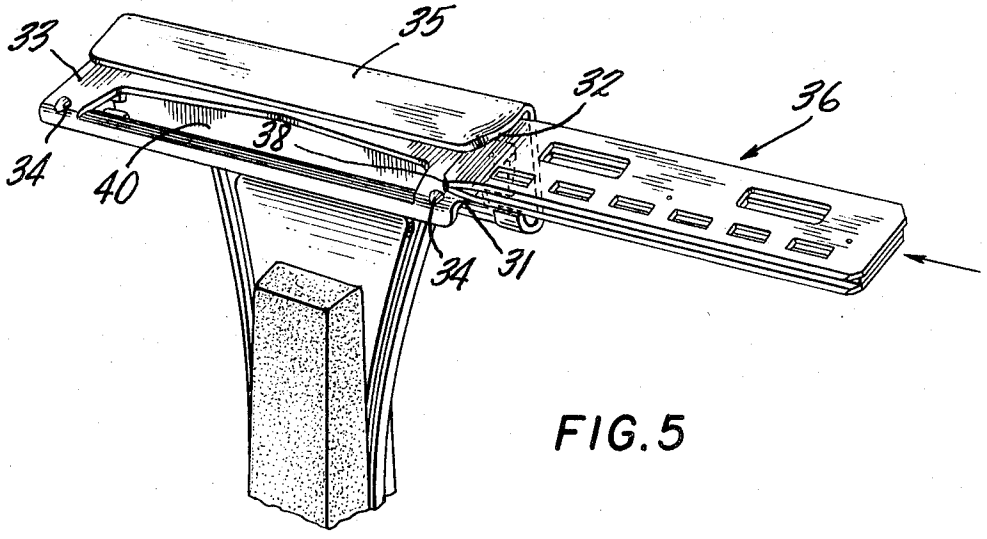


FIG. 5

TWIN BLADE INJECTOR UNIT

BACKGROUND OF THE INVENTION

The invention is in the art of injector type safety razors having replaceable blades adapted to be inserted from a blade holder dispenser. Details of the razors and dispensers common in the art vary considerably but in general the razors are characterized by having the blade clamped between a bridge or platform and an overhanging cap, the dispenser having a tang insertable in the razor head to open up a space sufficient to free the blade and thereupon a slide on the dispenser is manipulated to push forward the blade into the razor head, the advancing end engaging the used blade and pushing it out of the razor head. The dispenser tang is then withdrawn leaving the new blade in clamped position in the razor head. Reliable blade changing operation depends upon the forward end of the incoming blade engaging the outer end of the blade in the head and pushing it from the razor and not by-passing the end of the used blade. Many patents have issued covering variations in this type of injector razor, the patents to Butlin No. 2,701,910 and Kuhnl No. 2,911,713 being representative. Commonly the bridge or platform has an opening or series of openings just rearwardly of the guard or soap bar whereby soap and debris in general may escape therethrough from under the forward cutting edge of the blade.

GENERAL DESCRIPTION OF THE INVENTION

The present invention concerns a twin or double injector blade unit comprising two superposed blades permanently secured together with an intervening spacer, the cutting edge of the top blade being spaced rearwardly a small distance from the cutting edge of the lower blade. The U.S. Pats. to Gray No. 1,975,757 and Tomek No. 3,262,206 disclose various forms of such a blade arrangement in general. Also the British Pat. No. 772,532 of 1957 shows a blade unit of the type having a pair of superposed double edge blades secured together with an intervening spacer.

The normal injector type razor is designed to receive the standard single edge blade having a thickness commonly in the range of 0.01 to 0.012 inch. Excessive opening of the razor by the dispenser tang must be avoided otherwise the ingoing blade end may slip past the end of the used blade in the razor resulting in jamming. Under the circumstances the replacement blade unit of the type concerned must be limited in thickness. One double injector blade unit presently on the market comprises merely two blades secured directly together having overall thickness of about 0.020 of an inch.

The double blade unit of the present invention embodies a spacer but the individual blades are made thiner, each having a thickness of about 0.006 of an inch and the spacer a thickness of about 0.008. The overall thickness thereby being about 0.020 of an inch. However, to ensure ready entrance of the blade into the razor head the spacer is shaped to terminate a short distance from the normally razor entering end of the unit. Injector razors of this type commonly in use have a rounded or coined bevel at the right end of the bridge at the blade entering end and in most cases also the corresponding end of the cap also has at least a slight radius, enabling the ready entrance of the present type blade unit. This results particularly from the fact that the spacer being terminated short of the end of the blade unit at the razor entering end, as the pair of individual blade ends enter the razor head they are deflected toward each other ensuring that the end of the blade unit engages the used blade in the razor pushing it out and avoiding any by-passing or jamming of the blades.

Other details and features will become apparent from a consideration of a representative blade unit as described hereinafter and shown in the drawing in which:

FIG. **1** is an exploded view of the three elements comprising the blade unit.

FIG. **2** is a top plan view of the assembled parts.

FIG. **3** is a bottom plan view of the assembled parts.

FIG. **4** is a cross-sectional view taken on the plane **4—4** of FIG. **2.**

FIG. **5** is a view in perspective indicating the procedure and effect of the injection of the unit in a representative type injector razor.

The blade unit comprises three elements, a top blade **10,** a spacer **11** and a bottom blade **12.** The blades **10** and **12** which are of the usual steel material may be identical as a matter of convenience and economy in manufacture. The top blade has its cutting edge **14** set back from the cutting edge **15** by a small distance such as about 1/32 of an inch. Each blade has a width of about 0.315 of an inch and the overall width of the assembled unit is slightly larger with a maximum of about 0.350 of an inch. The blades each have rectangular openings **16** which are utilized in the manufacture of the blade strip and they have no function in the final unit as employed in a razor. The spacer element **11** may be made of any one of various materials such as metal or plastic but preferably is composed of stainless steel corresponding to the material in the blades which preferably is stainless steel. The back edge **17** of the spacer may coincide with the back edge **18** of the lower blade **12** as indicated in the cross-sectional view of FIG. **4,** although it is not a necessary condition.

The method of joining the three elements may be varied as by mechanical means, such as staking or bent tabs or it may be by adhesive bonding including application of heat or by pressing or soldering or welding. In the specific form disclosed the preferred method of joining is by spot welding. In the case of a plastic spacer examples of assembly methods are hot staking or ultrasonic staking. Also if desired each of the blades near its front cutting edge is provided with a row of openings such as the slots **20** which are adapted to serve a function to be later described. As is indicated in FIG. **4** the front edge **21** of the spacer is positioned rearwardly of the slots **20** in the bottom blade for a purpose which will be described shortly. Of importance is the fact that the forward end **25** of the spacer terminates short of the end **26** of the two blades and the unit as a whole. Within limits the space between the end **25** of the spacer and the end **26** of the unit may vary, depending somewhat on the thickness of the spacer and of the respective blades among other factors but desirably is in the range below about ⅛ of an inch and preferably about 1/16 of an inch as in the embodiment shown. The three elements are in the present embodiment spot welded together at a series of spaced points which in the present case comprises three points, **28, 29** and **30.** The position of the spot weld **28** is of some importance and should be relatively close to the end **25** of the spacer to reduce or avoid any tendency of the ends of the blades to be deflected away from each other at that

end of the unit and preferably the ends of the blades may incline toward each other for the reason to be discussed shortly.

The thickness of each of the three elements may vary somewhat within practical ranges providing the overall thickness is not too great which in most cases is preferably in the range below about 0.025 of an inch. The blades should be in the range of 0.004 to 0.008 of an inch and the spacer in the range preferably of 0.006 to 0.010 of an inch. As a specific preferred combination the blades are each 0.006 of an inch in thickness and the spacer is 0.008 of an inch in thickness, the unit thereby having an overall thickness of 0.020 of an inch.

The importance of the spacer terminating short of the end **26** of the unit will be apparent from the manner of insertion of the blade unit in a typical injector razor. This is pictured in FIG. **5**. As previously described the edge **31** of the bridge **33** and usually also the edge **32** of the cap member **35** are each somewhat rounded. The illustration in FIG. **5** assumes that by insertion of the normal dispenser tang the bridge member **33** is sprung away from the cap member **35** a slight amount whereby the used blade in the razor is released from the stop elements **34** on the bridge and the clamping action on the blade between the cap and bridge members is slightly relieved whereby the blade in the razor is free to be moved outwardly to the left.

As the blade unit **36** is advanced into the mouth of the razor head the radii **31** and **32** facilitate the initial entrance of the blade unit and immediately after the initial entrance the ends of the two blades are deflected toward each other as indicated at **38** which assures that the forward end of the unit will engage the rear end of the blade in the razor and will slide the used blade outwardly to the left, whether it is a standard blade having a thickness of no more than about 0.012 of an inch or is a unit similar to that being inserted.

It may be noted that injector razors of the type involved usually have a slot extending down through the bridge or a series of slots. FIG. **5** shows a single slot **40**, and as previously mentioned the blades have a row of holes **20** near their cutting edge. By reference to FIG. **4** it will be apparent that the soap and other debris in shaving collecting below the bottom blade **12** will have a flow path down through the opening **40** and furthermore debris collecting under the forward edge of the top blade **10** between it and the bottom blade **12** will have a somewhat free escape through the openings **20** in the bottom blade and may continue on down through the bridge opening **40.**

A representative embodiment of the invention has been disclosed and described but it will be apparent that various changes may be made in the details of the blade unit some of which have been indicated and different embodiments of the invention made without departing from the principles thereof and it is intended that all matter contained herein shall be interpreted as illustrative and not necessarily in a limiting sense.

What is claimed is:

1. A safety razor injector blade unit adapted to be inserted in and fit a single edge injector razor, said unit comprising two thin blades each with a forward cutting edge and an intervening thin spacer, said blades and spacer being permanently secured together, the cutting edge of each blade extending for substantially the entire overall length of the respective blade, said unit having a first end adapted to be the advance end of the unit in insertion in the razor, the spacer occupying the major portion of the length of the unit but terminated short of said first end and the blade cutting edges, whereby upon insertion of the unit in a razor the corresponding ends of the blades may flex toward each other.

2. A safety razor injector blade unit in accordance with claim **1** in which the blades each have a thickness of not more than 0.008 of an inch, and the spacer has a thickness of not more than 0.010 of an inch.

3. A safety razor injector blade unit in accordance with claim **1** in which the overall thickness of the unit is within the range below 0.025 of an inch.

4. A safety razor injector blade unit in accordance with claim **1** in which the blades each has a thickness of about 0.006 of an inch and the spacer has a thickness of about 0.008 of an inch.

5. A safety razor injector blade unit in accordance with claim **1** in which the spacer is terminated short of the advance end of the unit by a distance in the range of below about **150** of an inch.

6. A safety razor injector blade unit in accordance with claim **1** in which the forward cutting edge of the top one of the blades is set back of the forward cutting edge of the other blade.

7. A safety razor injector blade unit in accordance with claim **1** in which the lower blade has exposed openings therein between its cutting edge and the edge of the spacer.

8. A safety razor injector blade unit adapted to be inserted in and fit a single edge injector razor, said unit comprising two thin blades each having a thickness in the range of 0.004 to 0.008 of an inch and each having a forward cutting edge extending for substantially the entire overall length of the respective blade, and an intervening thin spacer having a thickness in the range of 0.006 to 0.010 of an inch, said blades and spacer being permanently secured together to form a unit having an overall thickness below 0.025 of an inch, said unit having a first end adapted to be the advance end of the unit in insertion in the razor, the spacer occupying the major portion of the length of the unit but terminated short of said first end and the blade cutting edges by a distance of about 1/16 of an inch, whereby upon insertion of the unit in an injector razor the corresponding ends of the blades may flex toward each other.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,872,592

DATED : March 25, 1975

INVENTOR(S) Clemens A. Iten

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 4, claim 5, line 31 "150" should read --1/8--

Signed and Sealed this

twenty-second Day of July 1975

[SEAL]

Attest:

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Attesting Officer

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Commissioner of Patents and Trademarks