

May 12, 1953

M. C. THOMPSON
RAZOR BLADE CARTRIDGE UNIT

2,637,900

Filed Oct. 17, 1947

2 Sheets-Sheet 1

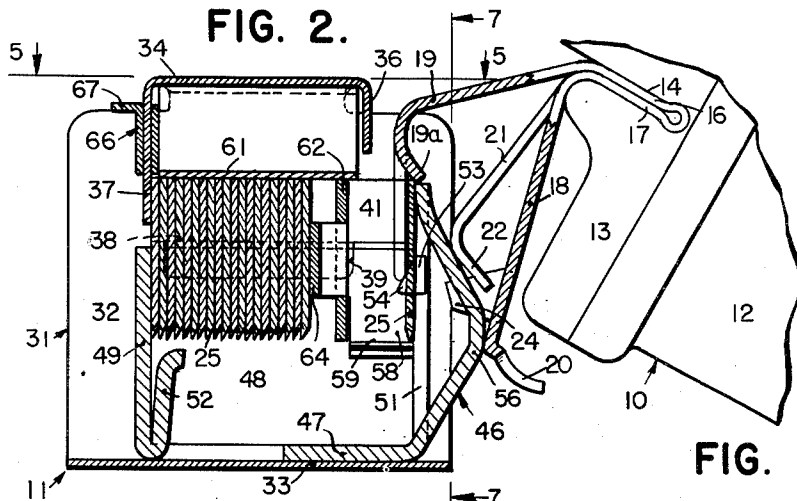


FIG. 1.

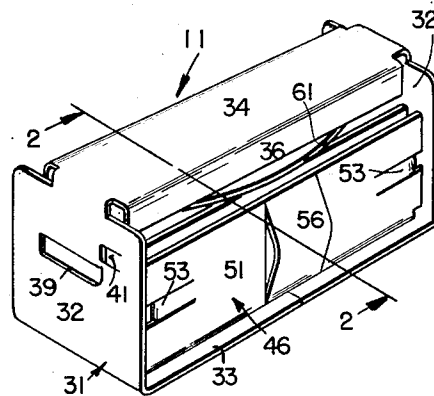
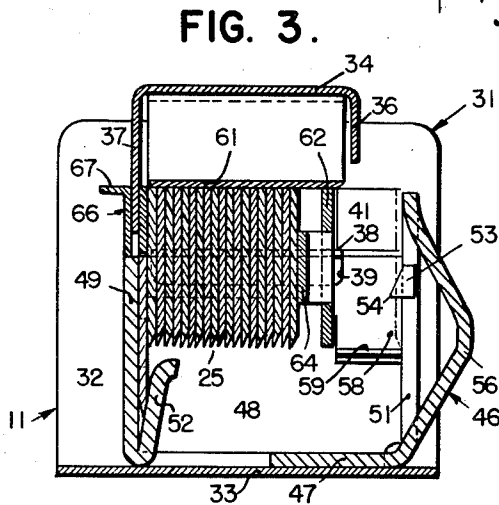
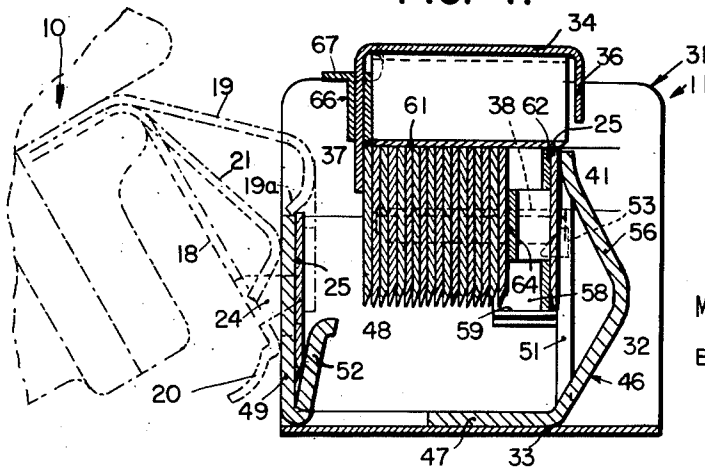


FIG. 4.



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FIG. 5.

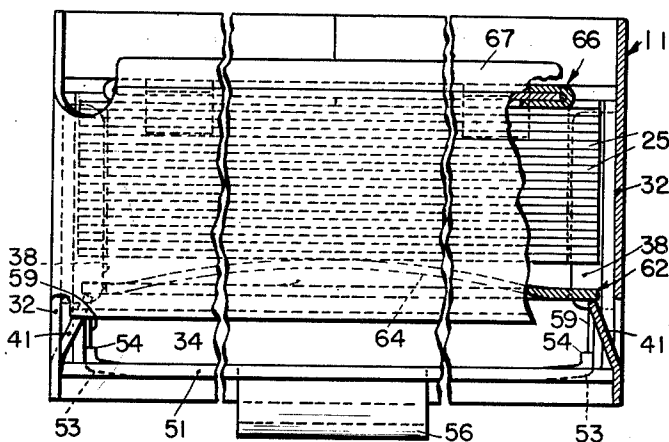


FIG. 6.

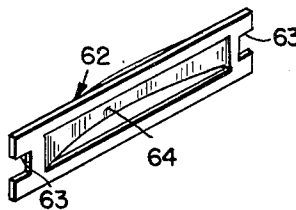


FIG. 7.

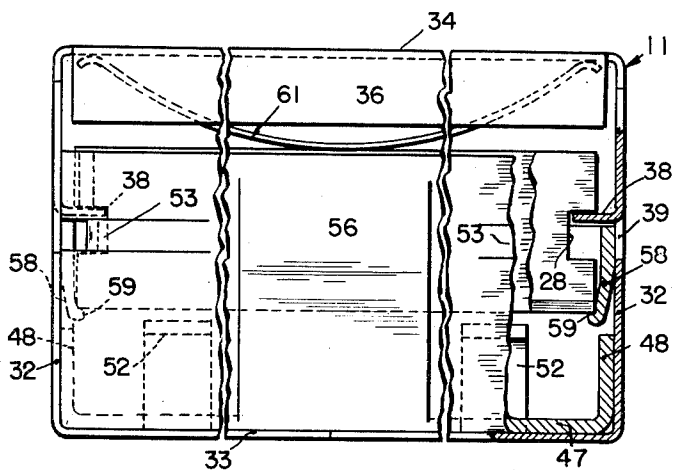


FIG. 10.

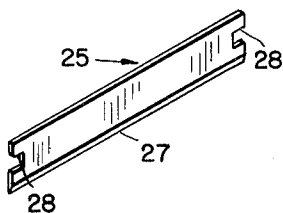


FIG. 8.

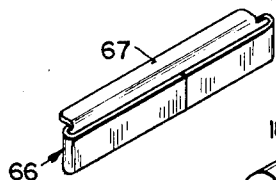
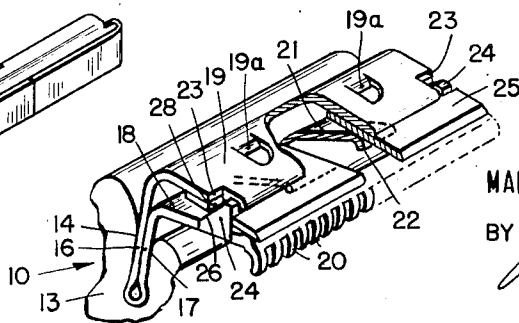


FIG. 9.



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RAZOR BLADE CARTRIDGE UNIT

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Application October 17, 1947, Serial No. 780,460

17 Claims. (Cl. 30-40)

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The present invention relates to razors in general and particularly to razor blade-loading means. More specifically the invention comprises an improved razor blade-loading unit into which used blades are ejected by the razor and by which new blades are positioned in the razor.

The safety razor has largely displaced the straight edge as a means of removing the modern man's beard. The inherent advantage from the standpoint of safety, and the advantage of having a sharp edge at all times makes the modern safety razor in the opinion of many a necessity. The safety razor normally comprises a handle to which is detachably connected a head, including a cap and a bed between which the cutting blade is clamped. Dull blades are replaced by detaching the handle from the head and then separating the cap and the bed. A new blade may then be positioned, the head reconnected to the handle, and the razor is again ready for use. The necessity for this assembly and disassembly operation can be viewed as an inherent disadvantage. Additionally there is the danger that the fingers will accidentally be cut by edges of the blades during the handling.

In a newer type of razor the blade is seated in the head and in displaced by the insertion from the side of a new blade from a cartridge in which a plurality of blades are positioned. This construction has the inherent advantage that it is unnecessary to disassemble the razor proper in order to displace the old blade and to replace it. It has the disadvantage, however, that the displaced blade is unprotected and is permitted to fall to the floor or into the wash basin from which it must be retrieved.

In the safety razor and blade-loading unit constructed in accordance with the present invention the dull blade is removed by bringing the razor into cooperative relationship with the blade-containing cartridge unit at which time by a simple manipulation the old blade is unseated from the razor and positioned in the unit. By a different manipulation, which includes bringing the razor into a new cooperative relationship with the cartridge unit, a new blade is positioned for use in the razor. The entire operation requires no skill and has the inherent advantage that it is not necessary to disassemble the razor in order to replace the dull blade. It is characterized by the further advantage that the worn and dull blade is displaced into the blade-containing cartridge so that it is not permitted to fall onto the floor or other surface to constitute a hazard.

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With an appreciation of the defects of the razors and blade-loading means comprising the prior art it is an object of the present invention to provide a new and improved razor blade-loading cartridge.

It is another object of the invention to provide a new and improved blade removal means for a safety razor.

Still another object of the invention is to provide a blade-containing unit adapted to cooperate with the razor to displace a dull used blade and to position a new sharp blade.

Still another object of the invention is to provide an improved combination safety razor and loading means in which the dull used blade is removed from the razor by the cooperative interaction of the razor and the new-blade-carrying means by which the dull blade is retained, the new blade being positioned by a second cooperative interaction of the razor and the new-blade-containing means.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings to which they relate.

Referring now to the drawings in which a preferred embodiment of the present invention is illustrated:

Figure 1 is a view in perspective of the blade-containing cartridge unit constructed in accordance with the present invention;

Figure 2 is a vertical section through the unit upon the line 2-2 of Figure 1 and illustrates the cooperative relationship of the razor and the cartridge unit in the displacement of a dull blade from the razor;

Figure 3 is a view similar to Figure 2 and illustrates the intermediate step of preparing the cartridge unit for the razor-loading operation;

Figure 4 is a view showing the cooperative relationship of the cartridge unit and the razor during the loading operation;

Figure 5 is a top view of the cartridge unit, certain parts being broken away and shown section upon the line 5-5 of Figure 2;

Figure 6 is a view in perspective of the blade follower;

Figure 7 is a side view of the cartridge unit looking in the direction of the arrows upon the line 7-7 of Figure 2;

Figure 8 is a view in perspective of the manually depressible blade-shifting element the operation of which positions a new blade in position to be transferred to the razor being loaded;

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Figure 9 is a view in perspective of the head of the razor constructed in accordance with the present invention; and

Figure 10 is a perspective view of a razor blade adapted to be used in the razor and in the cartridge unit comprising the present invention.

Referring again to the drawings, a razor constructed in accordance with the present invention is indicated generally by the reference character 10, and the blade-carrying cartridge unit is indicated generally by the reference character 11. Referring first to the razor 10, it is seen to comprise a handle 12 which may be of any desired diameter, length and general contour to which is attached at one end a head 13. The handle 12 and head 13 may be made of a suitable rigid material, such as metal or plastic, and as distinguished from the common type safety razor are not separable for the purpose of removing and replacing dull blades. A transverse slot 14 is formed in head 13 and seats the end sections 15 and 17 of the bed 18 and cap 19, respectively, which, in the preferred form illustrated, are formed of a single piece of metal folded upon itself.

In a manner not uncommon in safety razors the bed 18 is provided at its outer edge with a series of aligned teeth 20 which are curved gently downwardly away from the upper surface of the bed to function as a guard to space the blade properly relative to the epidermis. Between its ends there is struck from the bed 18 an upwardly and forwardly curving leaf spring 21 adapted to contact the under side of a blade 25 to hold it against the cap 19. The forward edge of this spring 21 curves downwardly and away from the cap as is illustrated clearly in Figure 9 at 22. Cap 19 slopes forwardly and downwardly toward the bed, being formed at its rear with inwardly extending ears 19a which contact and position the inner edge of a seated blade. At its forward edges cap 19 at its corners has cut-out notches 23 into which extend dogs 24 formed integrally upon the bed 18. The inner faces of dogs 24 are forwardly and outwardly inclined in the manner indicated at 26 in Figure 9.

The razor blade 25 adapted to cooperate with razor 10 is shown in perspective in Figure 10 and is seen to be flat and sharpened along one edge 27. At its ends substantially midway between its sides cut-out notches 28 are formed in the blade and are adapted to receive the dogs 24 formed upon bed 18. Blade 25 is shown operatively positioned in the razor in Figure 9 and dogs 24 are seen to extend into the notches 28, the upper surface of the blade being pressed against the under side of cap 19 by the resilient force exerted by leaf spring 21.

The razor constructed in accordance with the present invention is desirable because of its simplicity and because of the ease with which it may be constructed, the entire blade-mounting head being formed integrally of one piece suitably shaped and folded upon itself into the configuration shown.

Referring now to the blade-carrying cartridge unit 11, that element is seen to comprise an exterior case 31 open at its sides and including end walls 32, a bottom wall 33, and a top wall 34, the latter being shaped as a downwardly facing channel having its own side walls 36 and 37. The interior of casing 31 as defined by the end walls 32 and the bottom wall 33 forms an uninterrupted open-ended passage except for the presence of apposed inwardly extending shelves or

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ledges 38 pressed from the end walls 32 leaving side openings 39. There are also struck out from the end walls 32 apposed inwardly flexed flat leaf springs 41 positioned adjacent one end of each shelf 38 and at a slightly higher level.

Positioned within the cartridge casing 31 and adapted for transverse displacement by sliding in engagement with end walls 32 and bottom wall 33 is a box-like carriage 45 comprising a bottom wall 47 connecting end walls 48 and side walls 49 and 51. Side wall 49 is formed upon its inner face with two upwardly extending extensions 52, struck from bottom wall 47, which make acute angles with the wall itself and serve as blade retainers as will be described. Side wall 51 is formed with two struck-out leaf springs 53 the ends of which extend inwardly to form detents 54 having inwardly and downwardly sloping upper faces. Wall 51 is also formed with a pressed out central cam section 56 which also functions as a handle by which the carriage 46 can be moved relative to the casing 31.

With the cartridge unit in its new relationship a multiplicity of juxtapositioned new blades 25 are positioned in the unit, the upper edges of their notches 28 resting upon the apposed and aligned shelves 38 in the manner illustrated clearly in Figure 7. A curved leaf spring 61, the ends of which abut the interior surface of channel 34, centrally contacts the upper edges of the blades 25 and forces them downwardly against the ledges 38. Additionally a slidable follower or end plate 62 urges the blades to the left, as viewed in Figures 2, 3 and 4. Plate 62, shown most clearly in Figure 6, is dimensioned similarly to the blade 25 and is provided at its ends with notches 63 which ride upon the ledges 38. A central flexible curved portion 64 pressed from the body of the plate functions as a spring which at all times urges the blades to the left. With the cartridge unit filled with new blades follower 62 is held against displacement from the ends of shelves 38 by the springs 41 formed in the casing end walls 32 in the manner shown in Figure 3.

The end walls 48 of carriage 46 are formed with integral inwardly flexed, downwardly extending spring elements 58, the lower edges of which are turned inwardly to form supporting lips 59, as is shown most clearly in Figure 7.

The construction of the cartridge unit is completed by a manually-depressible feed element or plunger 66 shown in perspective in Figure 8 and in its ready-to-operate position in Figure 2. It may be formed as an elongated continuous metal band from one side of which extends a shoulder 67 adapted to receive a manually applied downward force. The element seats slidingly upon the vertical end wall 37 of channel 34 and in its initial and normal position its inner side overlies the end blade 25 which is held against the wall 37 by the action of leaf spring 64 of follower 62. This end blade, it is to be noted, is beyond the end of the supporting ledge 38.

Referring now to Figure 2 in particular, there is shown a blade-carrying cartridge unit fully loaded with new blades. The carriage 46 has been moved manually to its razor-unloading position and the V-shaped blade carriers 52 are located below that blade 25 positioned at the left side of the series of blades. In Figure 2 the operation of dislocating the used blade from the razor is also indicated. The razor head is advanced until the guard teeth 20 contact the outer side of the top of the wall 51 so that the latter may enter

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between the blade and the bed 18 by which the teeth are carried. The razor head is then forced downwardly so that the teeth 29 slide downwardly along the cam 56 while the cap 19 and the blades 25 move downwardly adjacent the inner side of the wall 51. The cam 56 displaces the bed 18 sufficiently as to enable the dogs 24 formed thereon to move downwardly and adjacent the exterior of wall 51. Blade 25 is unable to slip relative to the cap 19 by virtue of the presence of the inwardly extending ears 13a and so is forced downwardly along the inner side of wall 51, the detents 54 formed in the latter being cammed outwardly until the blade notches 28 are positioned adjacent thereto at which time they snap inwardly and into those notches. The used blade is then in the dotted line position shown in Figures 2 and 3, its further downward movement being prevented by the contact of its lower corners with the lips 59 on the springs 58 and its upward movement being prevented by the detents 54. The razor head can then be removed by an upward force, the guard teeth sliding along the surface 56.

The next and intermediate operation comprises the manual depressing of the feed element 66 by a downward pressure exerted upon its shoulder 67 from its initial position shown in Figure 2 to its position shown in Figure 3. The inner side of element 66 overlies the end blade 25 and this downward movement forces it from alignment with the remainder of the blades and downwardly into frictional seating relationship within the V-shaped carriers 52. This contact of the blade with the carriers does not dull its cutting edge due to the relative angularity of the carrier and the edge, frictional contact being made by the carrier with the blade at a point spaced inwardly from the edge in the manner shown in Figure 3.

The feed element 66 is then returned to its initial position illustrated in Figure 2, whereupon the spring 64 of the follower 62 forces the entire group of blades 25 to the left, the end blade again making contact with the end wall 37 of the channel 34 and being spaced beyond the shelves 38.

The next operation comprises the sliding of the carriage 46 from its right hand position, illustrated in Figures 2 and 3, to its left hand or blade-loading position, illustrated in Figure 4. This movement accomplishes two purposes. First, it puts the blade 25 carried in the V-shaped carriers 52 in position to be picked up by the razor, and second, it shifts the dull blade 25 which has been deposited in the cartridge unit into its permanent carrying position. Turning first to this last function, the dull blade was deposited, as illustrated in Figures 2 and 3, adjacent the inner side of side wall 51 and rested upon the lips 59 of springs 58 formed in the end walls 48 of the carriage. Downward displacement of the blade was prevented by the lips 59 and upward displacement was prevented by the detents 54 carried by the side wall 51. The movement of the carriage to the left forces the dull blade 25 relative to the enclosing casing 31 so that it slides past the leaf springs 41 which slope inwardly from the end walls 32 of which they are a part. The blade flexes the spring elements 41 to the side and the latter immediately flex inwardly under their own resilience and lock the blade in place. Immediately before leaving the springs 58 the notches 28 of the blade engaged the shelves 38 formed integrally in the casing end walls 32. It is seen that the used blade is thus positioned upon the right hand side of the follower 62, its displacement

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to the right and off the ends of shelves 38 being prevented by the springs 41, its displacement downwardly is prevented by the shelves 38, and its displacement upwardly by the spring 61 which acts downwardly upon all blades in the cartridge. As successive dull blades are fed into the unit and as new blades are displaced from the opposite side thereof the follower 62 will gradually advance from its original right hand position illustrated in Figure 2 until ultimately it will reach an extreme left hand position at which time the cartridge unit will be entirely empty of new blades and will be filled with old blades.

Turning now to the second function made possible by the movement of the carriage 31 to the left to the position shown in Figure 4, the new blade 25 is seen to be separated from its fellows and to be supported in the carriers 52. The razor-loading operation now to be accomplished is substantially the reverse of the unloading operation previously described. The razor is advanced relative to the side wall 49 of the carriage 46 so that the upper edge of the wall moves between the cap 19 and the spring 21 of the bed 18. The cap 19 at its forward curved end moves downwardly on the inner side of the blade 25 while the bed 18 moves downwardly, its dogs 24 moving downwardly in slots suitably provided in the end wall 49 to receive them until finally they reach the notches 28 in the blade 25 at which time they enter therein. It is then possible by an upward force exerted in the razor and through the dogs 24 to withdraw the blade from its position in the carriage 46 at which time it will be positioned between the cap 19 and the bed 18, in the manner illustrated clearly in Figure 9.

The unloading and loading operations of the razor constructed in accordance with the present invention can be repeated until all of the new blades provided in the cartridge unit have been used and displaced by old blades which will be positioned upon the opposite side of the follower 62. The unloading and loading operation is a simple relative manipulation of the razor and the cartridge unit to displace the blade from the razor, a simple straight-line motion to position a new blade in the carriers 52 with the carriage 46 into the loading position, and the second inter-engagement of the razor and the unit to position the new blades therein.

While the particular apparatus herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

I claim:

1. A construction to load a razor of the type comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with means to limit the displacement of a blade being positioned, and the second of said plates being provided with means to prevent the displacement of said blade in the opposite direction after it has been positioned, comprising: a blade carrier including a support releasably supporting a blade against unintentional displacement and exposing the edge of said blade opposite the cutting edge, a spreading element to effect the spreading of the cooperating plates of said razor as they are advanced

along said blade from said exposed edge toward said cutting edge until the means to limit displacement on the first of said razor plates abuts the exposed edge of said blade, said support being adapted to release said blade for withdrawal with said plates upon their movement in the reverse direction and after the means to prevent displacement on said second plate has engaged said blade during the movement of said plates.

2. The construction recited in claim 1 characterized in that said carrier includes a blade magazine adapted to contain a plurality of blades, and in that means are provided to displace a blade from said magazine and to position it in said support.

3. The construction recited in claim 1 characterized in that said carrier includes a blade magazine adapted to contain a plurality of blades in parallelism, and in that manually operable means are provided to transfer said blades sequentially from said magazine to said support.

4. A safety razor blade-feeding-and-receiving unit comprising a casing formed with blade-supporting means, a manually displaceable carriage slidable in said casing relative to said blade-supporting means and including blade-receiving means to remove a dull blade from a razor and blade-feeding means to insert a new blade in a razor, characterized in that the shifting of said carriage from a blade-receiving position to a blade-feeding position effects the transfer of a dull blade from the blade-receiving means to said blade-supporting means.

5. The construction recited in claim 4 characterized in that manually operable means are provided to transfer a new blade from said blade-supporting means to said blade-feeding means.

6. The construction recited in claim 5 characterized in that said blade-feeding means is positioned to receive said new blade from said blade-supporting means with said carriage positioned in its blade-receiving position.

7. A safety razor blade-feeding-and-receiving unit comprising a casing formed with open sides and with parallel shelves adapted to engage the notched ends of razor blades extended therebetween, a spring below the top of said casing to abut the upper edges of blades to hold them in position on said shelves, a depending wall limiting the movement of blades on said shelves in one direction, and leaf springs carried by walls of said casing limiting said movement in the opposite direction; a carriage displaceable relative to said casing and including blade-receiving means at one end of said shelves to remove a blade from a razor and blade-feeding means at the opposite end of said shelves to feed blades into a razor, said blade-receiving means being aligned with said shelves and adapted upon movement of said carriage in one direction to move a blade which it carries past said leaf springs and into said shelves.

8. The construction recited in claim 7 characterized in that said blade-feeding means are positioned in one position of said carriage to receive a blade from a series of blades supported by said shelves, and manually operable means to shift said blade from said series to said blade-feeding means.

9. The construction recited in claim 8 characterized in that said blade-feeding means is movable upon movement of said carriage from its blade-receiving position to a position to deliver a blade to a safety razor.

10. A construction to load a razor of the type

comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with means to limit the displacement of a blade being positioned, and the second of said plates being provided with means to prevent the displacement of said blade in the opposite direction after it has been positioned, comprising: a blade carrier including a support releasably supporting a blade against unintentional displacement and exposing the edge of said blade opposite the cutting edge, a spreading element extending rigidly adjacent one side of said blade to effect the spreading of the cooperating plates of said razor as they are advanced along said blade from said exposed edge toward said cutting edge until the means to limit displacement on the first of said razor plates abuts the exposed edge of said blade, said spreader being constructed and arranged as to enable the means to prevent blade displacement on said second plate to engage said blade, said support releasing said blade for withdrawal with said plates upon their movement in the reverse direction and after the means to prevent displacement on said second plate has engaged said blade during the movement of said plates.

11. A construction to load a razor of the type comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with dogs arranged to abut the edge of said blade opposite the cutting edge, and the second of said plates being provided with dogs to engage seats on said blade to prevent said blade being displaced from the dogs of said first plate after the blade has been positioned, comprising: a blade carrier including a spreading element extending rigidly adjacent one side of said blade to effect the spreading of the cooperating plates of said razor as they are advanced along said blade from said exposed edge toward said cutting edge until dogs of said first plate abut the exposed edge of said blade, said spreader being slotted to enable the dogs of said second plate to engage said blade, said support releasing said blade for withdrawal with said plates upon their movement in a reverse direction and after the dogs on said second plate have engaged said blade.

12. In combination with a razor of the type comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with means to limit the displacement of a blade being positioned, and the second of said plates being provided with means to prevent the displacement of said blade in the opposite direction after it has been positioned, a razor blade carrier including a support releasably supporting a blade against unintentional displacement and exposing the edge of said blade opposite the cutting edge, a spreading element to effect the spreading of the cooperating plates of said razor as they are advanced along said blade from said exposed edge toward said cutting edge until the means to limit displacement on the first of said razor plates abuts the exposed edge of said blade, said support being adapted to release said blade for withdrawal with said plates upon their movement in the reverse direction and after the means to prevent displacement on said second plate has engaged said blade during the movement of said plates.

13. In combination with a razor of the type

comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with means to limit the displacement of a blade being positioned, and the second of said plates being provided with means to prevent the displacement of said blade in the opposite direction after it has been positioned, a razor blade carrier including a support releasably supporting a blade against unintentional displacement and exposing the edge of said blade opposite the cutting edge, a spreading element extending rigidly adjacent one side of said blade to effect the spreading of the cooperating plates of said razor as they are advanced along said blade from said exposed edge toward said cutting edge until the means to limit displacement on the first of said razor plates abuts the exposed edge of said blade, said spreader being constructed and arranged as to enable the means to prevent blade displacement on said second plate to engage said blade, said support releasing said blade for withdrawal with said plates upon their movement in the reverse direction and after the means to prevent displacement on said second plate has engaged said blade during the movement of said plates.

14. In combination with a razor of the type comprising first and second cooperating plates adapted to clamp a cutting blade therebetween and resiliently opposing separation, the first of said plates being provided with dogs arranged to abut the edge of said blade opposite the cutting edge, and the second of said plates being provided with dogs to engage seats on said blade to prevent said blade being displaced from the dogs of said first plate after the blade has been positioned, a blade carrier including a spreading element extending rigidly adjacent one side of said blade to effect the spreading of the cooperating plates of said razor as they are advanced along said blade from said exposed edge toward said cutting edge until dogs of said first plate abut the exposed edge of said blade, said spreader being slotted to enable the dogs of said second plate to engage said blade, said support releasing said blade for withdrawal with said plates upon their movement in a reverse direction and after

the dogs on said second plate have engaged said blade.

15. A container for safety razor blades comprising a magazine adapted to contain a plurality of blades, a carriage mounted for limited displacement relative to said magazine and including a blade receiver to remove blades from a safety razor and to feed said blades to said magazine and a blade supplier to receive blades from said magazine and to supply said blades to a safety razor, characterized in that in one position of said carriage said blade receiver is positioned to receive a blade from a razor and said blade supplier is positioned to receive a blade from said magazine, and in that in a second position of said carriage said blade supplier is positioned to supply a blade previously received from said magazine to a razor brought into cooperative relationship thereto.

16. The construction recited in claim 15 characterized in that said magazine is provided with a manually operable blade displacer to displace a blade into said supplier with the latter positioned in said one position of said carriage.

17. The construction recited in claim 15 characterized in that the blade receiver is aligned with said magazine and in that a blade carried by said receiver is transferred into said magazine upon the movement of said carriage from said one position to said second position.

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