Aug. 29, 1944. L. KUHNL 2,357,208

RAZOR BLADE STACK

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Fig. 1.

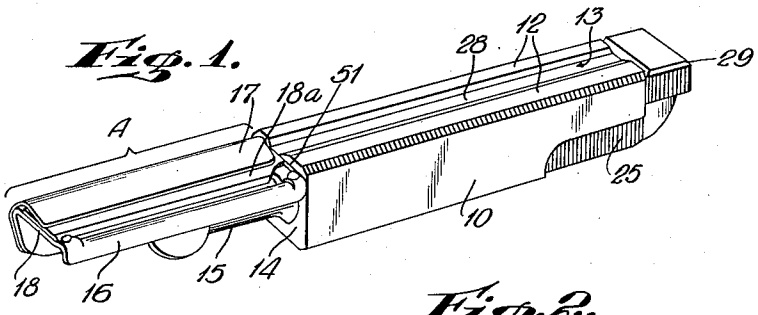


Fig. 2.

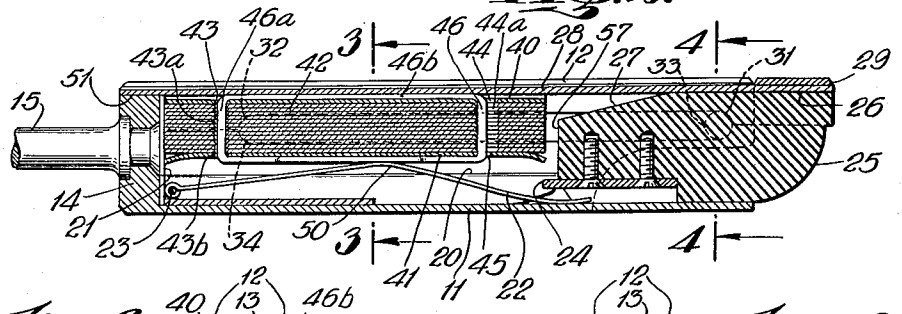


Fig. 3.

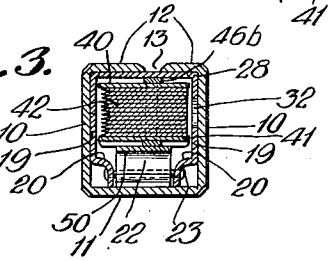


Fig. 4.

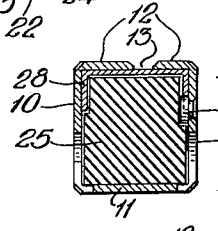


Fig. 5.

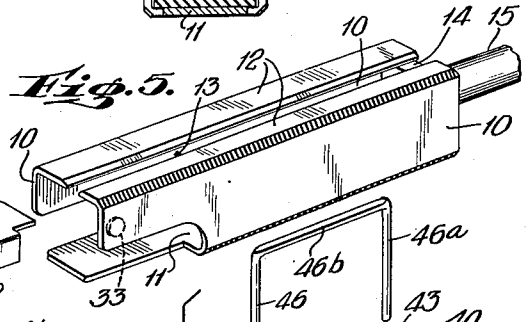


Fig. 6.

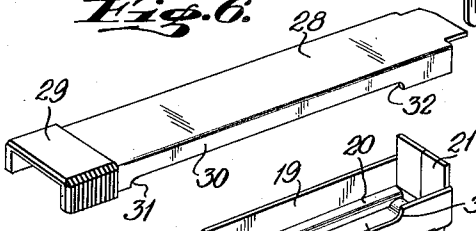


Fig. 7.

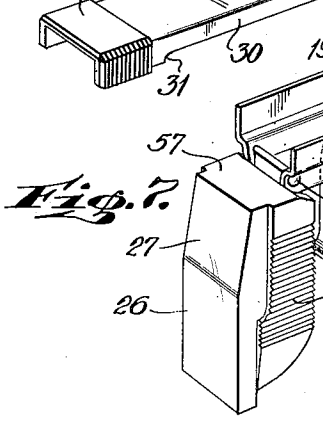


Fig. 8.

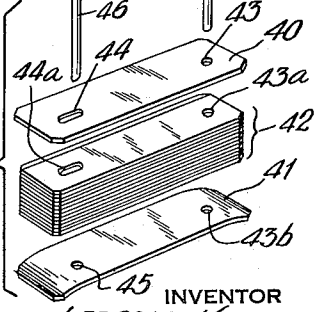
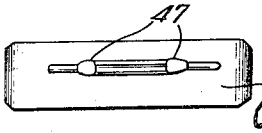


Fig. 9.



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Fig. 10.

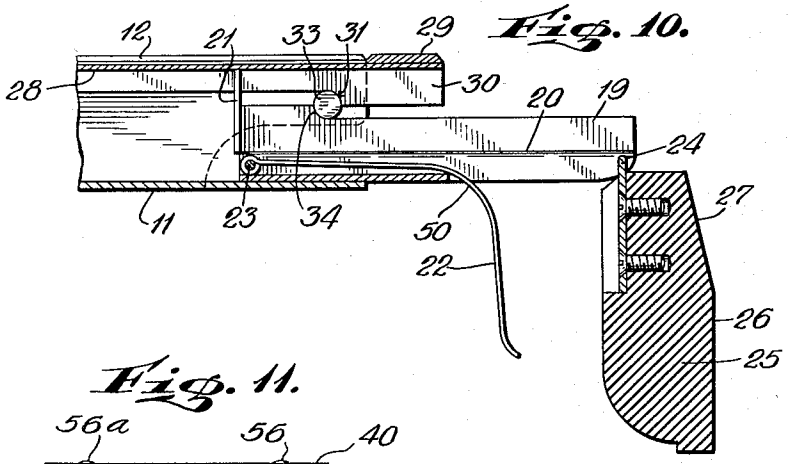


Fig. 11.

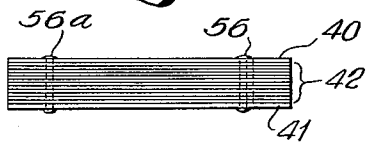


Fig. 12.

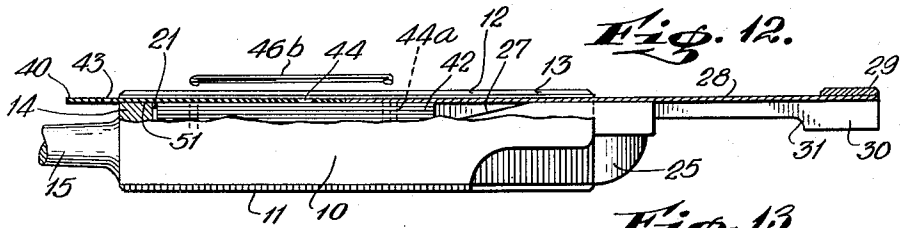


Fig. 13

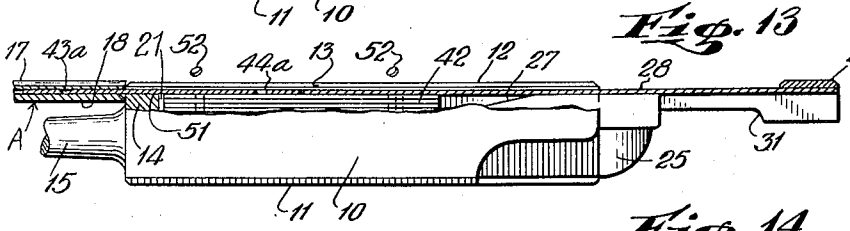


Fig. 14.

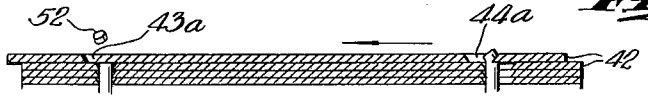
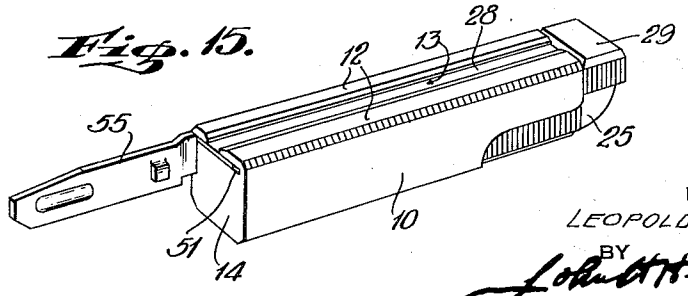


Fig. 15.



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UNITED STATES PATENT OFFICE

2,357,208

RAZOR BLADE STACK

Leopold Kuhnl, Bridgeport, Conn., assignor to Magazine Repeating Razor Company, New York, N. Y., a corporation of New Jersey

Application September 26, 1940, Serial No. 358,452

7 Claims. (Cl. 206—46)

The invention relates to razor blade magazines characterized by provisions for means for ejecting blades therefrom one by one as needed usually directly into the shaving head of a razor.

The invention is adapted for embodiment in the type of so-called "magazine" razor in which blades are contained in the handle and are ejected therefrom to a shaving head permanently mounted on the magazine, such as is illustrated and described in Schick U. S. Patent No. 1,797,733, issued March 24, 1931. It is also adaptable to the type of magazine razor employing a magazine separate from the razor which, in use, is brought into fixed alignment with the shaving head of the razor, whereupon a blade can be ejected from the magazine and located in shaving position in the razor head after which the magazine may be withdrawn. A typical example of such a razor is illustrated and described in Rodrigues U. S. Patent No. 1,969,945, issued August 14, 1934.

One of the objects of the invention is to provide for use in such a magazine a stack of blades that can be inserted as a unit therein without being enclosed in a container but which are nevertheless assembled and bound together in such manner that no impediment is offered to the action of the ejection mechanism of the implement.

Another object is a stack of blades assembled and bound together in the manner just above described and in which protection is supplied at all times against contact of the edges of the blades with any part of the implement.

Another object is a stack of blades than can be handled as a unit but from which nevertheless blades can be ejected by the ejection mechanism of the implement and which will be cheap and durable and capable of withstanding the treatment to which it may be subjected in transportation, by dropping, and other violent action.

Another object is a magazine for containing such a stack of blades but in which provision is made to hinder loading with a pile of loose blades since, when loose blades are inserted in such a magazine, it is difficult if not virtually impossible to so locate them that there is no contact of the cutting edges with parts of the implement.

Referring to the drawings:

Fig. 1 is a perspective view showing the exterior of a magazine such as I have referred to, to which is added a razor head of the permanently affixed type;

Fig. 2 is a view in longitudinal vertical section of Fig. 1 with the razor head omitted;

Fig. 3 is a view on the line 3—3 of Fig. 2;

Fig. 4 is a view on the line 4—4 of Fig. 2;

Figs. 5, 6, and 7 show the units which, when assembled together, constitute the magazine of Fig. 1;

Fig. 8 is an exploded view of the blade stack;

Fig. 9 is an under side view of the blade stack;

Fig. 10 is a broken view in vertical longitudinal section showing the blade stack carrier withdrawn;

Fig. 11 is a view of a modified form of blade stack;

Fig. 12 is a view similar to Fig. 10 but showing the plunger in the process of ejecting a blade;

Fig. 13 is a view similar to Figs. 10 and 12 showing the plunger still further advanced;

Fig. 14 is a longitudinal vertical section of several blades of a stack illustrating how they are freed one by one from the stack;

Fig. 15 is a perspective view showing the exterior of the magazine adapted for the type of razor above referred to employing a separate magazine.

Referring more in detail to the drawings, the casing or housing of the magazine comprises an elongated boxlike structure (see Fig. 5) having the side walls 10, 10 and the bottom wall 11, the top wall consisting of two flanges 12, 12 which approach each other, leaving however the slot 13. The end is closed by the wall 14 from which projects the post 15 which serves as a support for the razor head indicated as a whole by the letter "A." As this razor head is of conventional construction it will not be described further than to state that it comprises a guard 16, a top blade clamping plate 17, and a blade platform 18. It is pivoted to the post so that it can be rotated from the position shown in Fig. 1 where it is in alignment with the magazine blade ejection orifice for receiving a blade, to a position normal to the post for shaving. A blade 18a is shown in shaving position clamped between the clamping plate 17 and the blade platform 18.

The blade stack carrier shown in perspective in Fig. 7 comprises the side walls 19, 19 formed with the seats 20 (Fig. 3) (both being similar but only one being shown) on which the blade stack rests when it is first inserted, as will be hereinafter further explained. The blade stack carrier also is provided with an end wall 21 and with a spring 22 which, when not under stress, takes approximately the shape shown in Fig. 7—i. e., more or less of a right angle, the vertex however being constructed on a curve. The spring is piv-

otally mounted to the blade stack carrier as shown at **23**, Fig. 2.

Also affixed or pivotally mounted at **24** to the blade stack carrier is the thumb and finger piece **25**, and it will be observed that the surface **27** slants off from the surface **26**.

A plunger for ejecting blades from the stack, as will be presently explained, is illustrated in Fig. 6 by the numeral **28**, it being provided with a thumb and finger piece **29** for conveniently operating it. It has side flanges **30** (see Fig. 6 where however only one is shown) which serve to stiffen it. One of these flanges is cut away from the point **31** to the point **32**, the distance between which represents the length of the stroke of the plunger in ejecting a blade. The parts are assembled by first inserting the plunger in the casing, then inserting the blade stack carrier, or vice versa, and then inserting the stop lug **33** which acts as a stop against the abutments **31** and **32** of the plunger and also as a stop against the abutment **34** of the blade stack carrier. Its purpose is merely to prevent dislocation or excessive motion of the parts while manipulating the device.

Figs. 8 and 9 show component parts of the blade stack before being assembled and bound together, as will be explained. It comprises a top plate **40**, a bottom plate **41**, and a pile of blades **42**, the cutting edges of the blades being on the same side as shown. The top plate **40** and the bottom plate **41** are slightly wider than the blades and extend over the cutting edges. The top plate, the blades, and the bottom plate are all provided with registering apertures **43**, **43***a*, and **43***b*—that is to say, these apertures are so located that when the parts are put together as shown in Fig. 3, the ends of all of them are flush with each other. The top plate **40** and the blades **42** are also provided with registering apertures **44** and **44***a*, but in this case the apertures are elongated instead of being round as in the case of the apertures at the opposite end. The essential point is that the fore-and-aft diameters of the apertures **44** and **44***a* are greater than the fore-and-after diameters of the apertures **43**, **43***a*, and **43***b*. The bottom plate **41** is also provided with an aperture **45** which in this case although not necessarily is preferably round and registers with the inner ends of the apertures **44** and **44***a* for purposes which will be later explained. Also it should be noted that the bottom plate **41** is slightly curved downwardly at each end. This will also be further explained in connection with the mode of operation.

The legs **46** and **46***a* which with the connector bar **46***b* constitute a filament serving as a binder for the stack are inserted—one leg **46***a* through the apertures **43**, **43***a*, and **43***b*, and the other leg **46** through the apertures **44**, **44***a*, and **45**, bringing the plates and the blades together as shown in Fig. 3, and then folding over the projecting ends of the legs as shown in Fig. 9 so that they lie side by side. If desired, they may be united by drops of solder or other adhesive **47**. The filament **46** is of a material and of such a thickness that it may be easily sheared by the mode of hand operation employed in ejecting a blade, as will be later described. It will be merely stated that examples of suitable materials are lead, soft lead, tin, solder, and various plastics, such as gutta percha only slightly vulcanized. The connector bar **46***b* and the folded-over legs of the binder may, if desired, be flattened to the section shown in Fig. 3.

A longitudinal vertical section through the apertures in the plates and blades is shown in Fig. 2, where it will be observed that the elongated apertures **44** and **44***a* in the top plate and blades offer considerable clearance to the leg of the U-shaped member that passes through them.

The diameters of the round apertures and the width of the elongated apertures should preferably be only enough greater than the diameters of the binder legs to permit easy insertion of the latter. Ordinarily the diameters of the apertures would be adjusted to the diameter of the binder since the latter diameter should not exceed that which, considering the material of which it is made, will not offer excessive resistance to the shearing operation which will be described in connection with the mode of operation. The shape of the apertures may obviously be varied from the round; for example, they may be square or any other section desired. Likewise, in the case of the elongated apertures, they may be true rectangles, if desired, or any other shape that permits them to function, as will be described. The cross-section shape of the binder legs could, of course, be varied to suit variations in the cross-section shape of the apertures. For easier shearing of the binder the apertures may be tapered which gives a more effective shearing edge.

The mode of operation will now be described with reference mainly to Figs. 10 and 12 to 14.

In Fig. 10 the blade stack carrier is shown withdrawn as far as it can go as determined by the stop lug **33**, the plunger still remaining inserted its full distance in the magazine, which distance is also fixed by the lug **33**. The blade stack is then deposited in the blade stack carrier. If the magazine is used in association with a shaving head as shown in Fig. 1, the edges of the blades will be directed as shown in Fig. 3. The blade stack carrier is then moved to the position shown in Fig. 2. In the process of moving it to this position, the spring **22** is placed under stress so that its curved portion **50** which extends through the open bottom of the blade stack carrier bears upwardly against the folded-over legs of the binder, forcing the entire assembly to the position shown in Fig. 2. Also during this step the thumb and finger piece **25** is swung up on its pivot so that it also enters the casing, likewise taking the position shown in Fig. 2. The magazine thus is loaded and is ready to be operated.

The first thing to be done is to withdraw the plunger to the limit of its movement, whereupon the blade stack by the pressure of the spring rises further until the top plate **40** bears throughout its entire length against the flanges **12**, **12** of the casing, the exposed connector bar of the binder rising into the groove **13**. The top plate **40** of the blade stack is now in line with the blade-ejecting orifice **51** of the magazine, and the plunger is abutting or very nearly abutting the rear end of the top plate **40**. The plunger is then forced inwardly driving the top plate before it, the top plate at the same time shearing off the connector bar **46***b* of the binder, as shown in Fig. 12. The top plate is of course of no use in shaving, and after it has been fully injected into the shaving head, a further stroke against the blade beneath it is necessary to eject it from the shaving head. Since the connector bar of the binder has been removed and likewise the top plate, the topmost blade is held in position only by the presence in the apertures of the ends of the binder. When the topmost blade is forced by the plunger,

it shears off by coaction of the edges of adjacent apertures small sections 52, 52 from the ends of the binder, thus permitting the blade to be ejected. The sheared sections will drop out or can be shaken out. It will be noted by reference to Fig. 14 that in the process of ejecting a blade, the ends of the binder which resist it are sheared in succession and not simultaneously. This is by virtue of the fact that the aperture in one end of the blade approximately fits the binder, while at the other end it is elongated being of greater fore-and-aft diameter—e. g., in Fig. 14 the aperture 43a has finished cutting off the disk shown just as the edge of the aperture 44a contacts with the other end. Continuation of the motion of the blade of course shears off the latter end, and the blade is consequently released from the stack.

In order to facilitate easy shearing of sections of the binder in the manner described, it is advisable to taper the cutting edges of the blade apertures as shown in Fig. 14.

It will be observed that it is highly essential that provision be made to prevent contact of the blade edges with the plunger and the blade stack carrier. This is effected, as may be seen from Fig. 3, by making the top and bottom plates slightly wider than the blade and so locating the apertures in all of them that the heels of the blades are flush with the rear edges of the top and bottom plates, or at any rate the top and bottom plates extend beyond the blade edges.

It is advisable as above referred to to slightly curve downwardly the ends of the bottom plate as is best shown in Fig. 8. The advantage is that, after the last blade has been ejected, further manipulation of the plunger will cause it merely to ride over the rear end of the bottom plate and also the other end of the bottom plate cannot pass through the blade ejection orifice because its end abuts against the end wall 21 of the blade stack carrier. It can however be shaken out together with loose portions of the binder when the blade stack carrier is withdrawn to the position shown in Fig. 10.

Fig. 15 is a perspective view of a magazine for a razor of the second type first above referred to. The magazine itself is similar in construction and mode of operation to the magazine of the previous figures. The only difference in this unit is that it employs the aligning finger 55 for aligning the blade ejection orifice with the shaving head of the razor as contrasted with the first form wherein the shaving head is permanently mounted on a magazine, which in that case constitutes the handle.

In order to prevent the loading of the magazine with a pile of loose blades with the consequent probability of their cutting edges contacting with the sides of the blade stack carrier or the plunger, or both, the slanting portion 27 of the thumb and finger piece 25 is provided. If a pile of loose blades be placed in the blade stack carrier when the latter is "open"—i. e., in the position shown in Fig. 10, and then the blade stack carrier is is pushed "in," the spring 22 will, in the course of this motion and before the blade stack carrier has been completely brought to its closed position, bear upwardly on the stack, pressing it as a whole against the plunger. Then, if the motion of the blade stack carrier is continued, the upper blade by virtue of its frictional contact with the plunger will drag, and this effect will be communicated to successive blades beneath it. In other words, it will not be possible by moving the plunger inwardly to position all the blades so that the plunger can operate on them since only the reduced front end 57 of the thumb and finger piece 25 is in abutment with blades of the pile. The reason is that the rear end of the topmost blade is too far to the rear of the plunger for the latter to abut against it. Furthermore, usually the topmost blade, or the topmost blade and a few of the blades below it, will wedge between the slanting surface and the plunger, which virtually acts as a chock against further inward motion of the blade stack carrier.

The binder has been described as comprising a U-shaped member with the ends of the legs bent or folded over toward each other and soldered, if desired. Another form of binder is, however, quite feasible and useful, and it consists of binding the top and bottom plates and the pile of blades together by rivets 56 and 56a extending through the apertures and headed on both ends, as shown. These rivets may be of the same material as that of the binder already described. Of course, the rivet 56 that passes through the apertures 44 and 44a would be positioned toward the inner ends of these apertures in the same manner as are the legs 46 of the binder previously described; in fact, it would be so located by virture of the fact that the aperture 45 in the bottom plate fits the rivet. As far as operation is concerned, it would be the same in both cases—that is to say, the modified blade stack would be inserted in the blade stack carrier and subsequent operations would be as have been described in connection with the preferred form.

As a precaution against a tendency of the plunger during its retractive movement to drag back with it the stack of blades especially when the number of blades in the stack has been reduced to three or four, I prefer to transversely serrate or otherwise roughen the spring 22 at the bend 50 where the latter contacts with the folded-over legs of the filament. In the case of the modification shown in Fig. 11, the serrated area exerts its friction against the bottom plate 41, this purpose best being served if the bottom plate 41 is of copper or other relatively soft metal. It should be stated that the bottom plate 41 in the modification of Fig. 11 may be, and preferably is, curved at its ends, as shown in Fig. 8.

I have described above certain embodiments of my invention, but I wish it to be understood that this is illustrative and not limitative of my invention and that I reserve the right to make various changes in form, construction, and arrangement of parts falling within the spirit and scope of my invention, as set forth in the claims.

I claim:

1. For use in loading a razor blade magazine of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with an aperture and all the apertures being in registry forming a continuous passage through the pile, a plate on the top of the pile and a second plate on the bottom of the pile, the plates extending beyond the edges of the blades and the plates also being provided with apertures registering with those of the blades, the blades and the plates being bound together by a filament of soft easily shearable material extending through the passage formed by the said apertures.

2. For use in loading a razor blade magazine

of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with an aperture and all the apertures being in registry forming a continuous passage through the pile, the units of the pile being bound together by material that occupies the passage, the said material having the property of being shearable by co-action of the edges of the apertures of two contiguous blades when one of them is driven along the other by hand pressure applied to the plunger.

3. For use in loading a razor blade magazine of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with two apertures one at each end, one of said apertures being circular and the other being oblong, the circular apertures all being in registry with each other and likewise the oblong apertures, the blades of the pile being bound together by a filament extending through the apertures, the filament being of substantially uniform cross-section area throughout and shearable by relative sliding movement of two contiguous blades over each other when one of them is driven along the other by hand pressure applied to the plunger.

4. For use in loading a razor blade magazine of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with two apertures one at each end, the fore-and-aft diameter of one aperture being greater than that of the other, the apertures of lesser diameter all being in registry with each other as likewise the apertures of greater diameter, the blades of the pile being bound together by a filament reeved through each set of apertures, the filament being of substantially uniform cross-section area throughout and shearable by relative sliding movement of two contiguous blades over each other when one of them is driven along the other by hand pressure applied to the plunger.

5. For use in loading a razor blade magazine of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with two apertures one at each end, all apertures at each end of the pile being in registry with each other, and the units of the pile being bound together by material that occupies the apertures, the said material having the property of being shearable by co-action of the edges of the apertures of two contiguous blades when one of them is driven along the other by hand pressure applied to the plunger.

6. For use in loading a razor blade magazine of the type in which blades are ejected therefrom one by one by means of a reciprocable plunger, a pile of blades with their cutting edges flush with each other and uncovered, each blade being contiguous to adjacent blades and provided with two apertures one at each end, all apertures at each end of the pile being in registry with each other and the units of the stack being bound together by a filament extending through the apertures, the filament being of material shearable by relative sliding movement of two contiguous blades over each other when one of them is driven along the other by hand pressure applied to the plunger.

7. For use in loading a razor blade magazine of the type in which blades are ejected endwise therefrom one by one by means of a reciprocable plunger, a stack comprising a pile of contiguous blades with their cutting edges flush with each other and uncovered together with a plate on the top of the pile and a second plate on the bottom of the pile, the plates extending over the edges of the blades, each plate and blade being provided with two apertures one at each end, all apertures at each end of the stack being in registry with each other, the units of the stack being bound together by a filament extending through the apertures, the filament being of material shearable by movement of any blade over a contiguous blade when the first-mentioned blade is driven endwise along the second-mentioned blade by hand pressure applied to the plunger.

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