July 4, 1933. J. MUROS 1,917,209

SAFETY RAZOR

Filed March 10, 1928 2 Sheets-Sheet 1

Fig. 1.

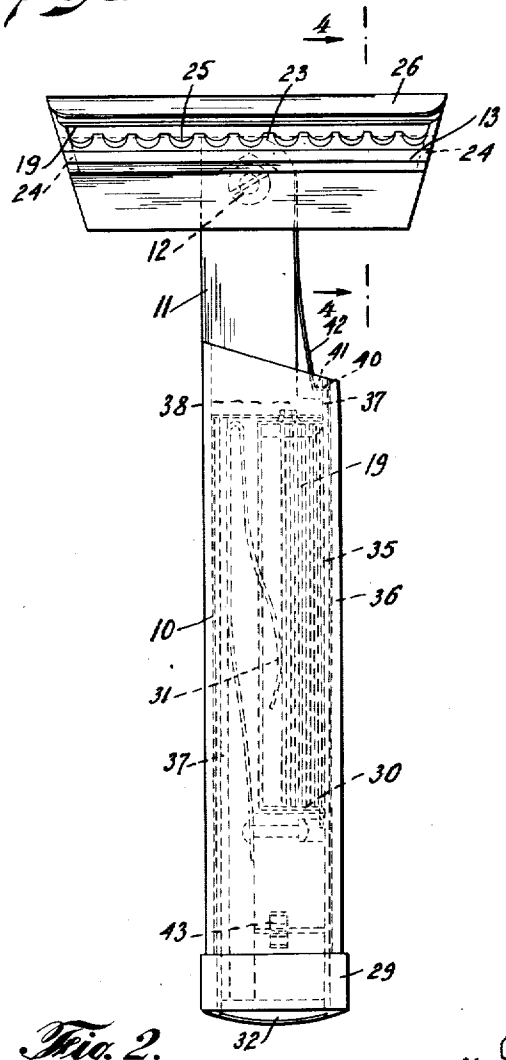


Fig. 2.

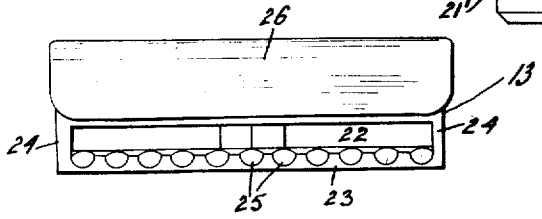


Fig. 4.

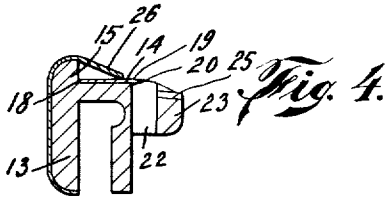


Fig. 3.

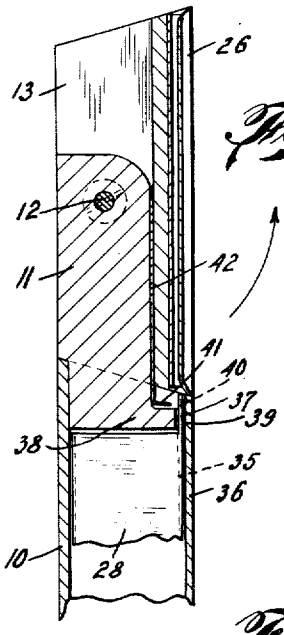
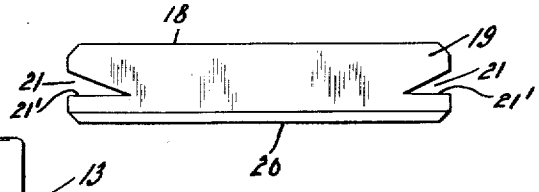


Fig. 6.



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July 4, 1933. J. MUROS 1,917,209

SAFETY RAZOR

Filed March 10, 1928 2 Sheets-Sheet 2

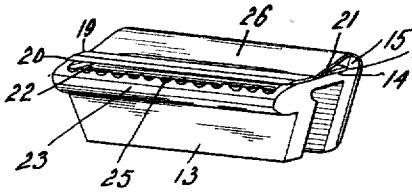


Fig. 5.

Fig. 7.

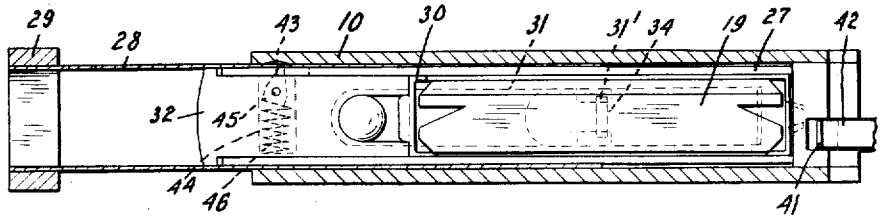
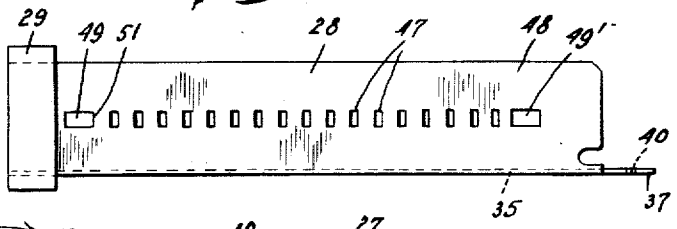


Fig. 8.



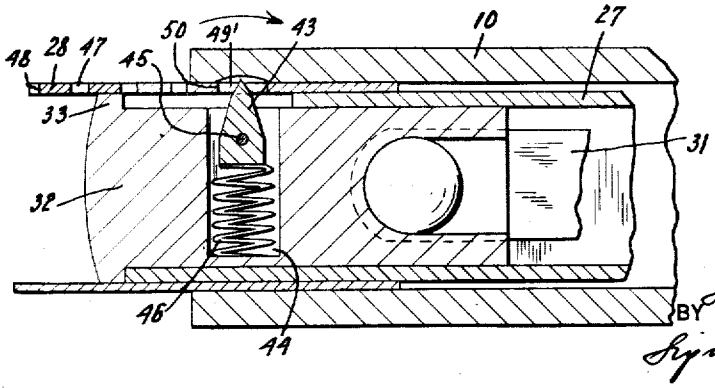


Fig. 9.

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Patented July 4, 1933 1,917,209

UNITED STATES PATENT OFFICE

JOSEPH MUROS, OF NEW YORK, N. Y.

SAFETY RAZOR

Application filed March 10, 1928. Serial No. 260,676.

The present invention relates to safety razors, and more particularly to a magazine razor of the type which employs blades in stacked relation and feeds them successively to shaving position, the blade fed to shaving position ejecting at the same time the used blade from the blade holder.

Razors of this type are old and well known. In the operation thereof several serious difficulties have been experienced. One of these difficulties consists in that the feeding mechanism thereof is operative in all positions of the blade holder, with the result that a new blade may be fed toward the blade holder when the clamping means of the latter are not in a position to receive the same, resulting in a jamming of the feeding means. This necessitates often returning of the razor to the factory, to be taken apart by experienced and skilled working men. Another difficulty consists in that the feeding plunger of the device, while limited in its stroke in either direction, may be reversed in movement at any point between the ends of the stroke and may thus feed more than one blade toward the blade holder. In this manner obviously unused blades are wasted. At the same time, however, the feeding mechanism is jammed, necessitating sending of the razor to the factory for repairs. A third difficulty consists in that the razor lacks a guiding mechanism for the blades as they are leaving the magazine. This not only results in that the blades are not brought into proper relation to the guard of the razor but sometimes in dulling the cutting edge of the blade.

The main object of the present invention is to generally improve the construction of safety razors of the type mentioned with a view of overcoming the difficulties above enumerated.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter described, pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and details of construction within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a razor constructed in accordance with the present invention, on a larger scale; Fig. 2 is a top plan view thereof; Fig. 3 is a central vertical section taken through the upper portion of the handle and the blade holder in the position in which a blade may be fed thereonto; Fig. 4 is a section taken on line 4—4 of Fig. 1; Fig. 5 is a perspective view of the blade holder; Fig. 6 is a plan view of a blade; Fig. 7 is a section taken through the handle and the feeding mechanism; Fig. 8 is a side elevation of the feeding plunger; and Fig. 9 is a section taken through a portion of the handle, plunger and the magazine, on a still large scale.

In the drawings, the numeral 10 indicates the handle of the razor, the same being hollow and, preferably, quadrangular in transverse cross-section. To the upper end of the handle is fixed a standard 11, and on the latter is mounted, by means of a pivot pin 12, the blade holder 13 of the razor. This blade holder is adapted to turn around the said pivot from the position shown in Fig. 1 of the drawings into the position shown in Fig. 3 of the drawings, in which it is in alignment with the handle or, in other words, it forms a continuation thereof. The upper end of the handle is closed adjacent the standard 11, as clearly appears from Fig. 3 of the drawings, while its lower end is open, to permit of insertion thereinto of the feeding mechanism, the magazine support and the blade container, as will be hereinafter more clearly described.

The blade holder comprises an oblong body provided with a blade supporting surface 14, above which rises a ledge 15, against which the rear edge 18 of the blade 19 is adapted to abut. The blade is what is commonly known as the wafer blade, having a single cutting edge 20 and being provided in each of its transverse edges with a V-shaped notch

21 extending longitudinally of the blade. The front edge 21′ of each notch extends parallel to the cutting edge of the blade. The cutting edge of the blade, when in position upon the blade holder, projects over a slot 22 in the blade holder, the forward edge of the said slot being in the form of a longitudinally extending bar 23, which constitutes a guard for the blade. This bar is connected at each of its ends by a wing 24 with the body portion of the blade holder, for a purpose hereinafter to be described. The bar has formed therein transverse grooves 25, which lead to the slot 22 as clearly appears from Fig. 2 of the drawings. With the blade holder co-operates a blade clamping member 26, which extends longitudinally of the support, projects over the ledge 15 and overlies the blade supporting surface of the holder. This clamping member is somewhat resilient, so that its ends are adapted to be seated in the notches 21, engaging the front edges 21′ thereof, thereby not only retaining the same in proper shaving position but serving also to guide the blade, as it issues from the magazine hereinafter to be described onto the blade holder. The manner in which the blade is so guided will be more fully described hereinafter.

The bore of the handle is quadrangular in transverse cross-section and has fitted into it a magazine support 27, which is in the form of a channel member and is fixed in position within the said handle. On this magazine support is slidably arranged a feeding plunger 28, which is also in the form of a channel member, it being provided with means, not shown, for limiting the outward movement thereof on said magazine holder. To the lower end of the plunger is fitted a knob 29, in the form of a ring, to facilitate manipulating of the plunger and serving also as a stop for limiting the inward movement thereof. The blades are supplied to the purchaser ready for insertion into the razor, they being stacked in a magazine 30 which is adapted to slide endwise and fit snug into the magazine-holder. With the magazine co-operates a blade spring 31, carried by a plug 32 the said plug having an enlarged outer end 33 fitting the knob 29 above described. For the purpose of fixing the plug and blade spring in proper relation to the blades within the magazine, the blade spring is provided with a projection 31′ which is automatically seated in an aperture 34 in the magazine-holder when the plug is inserted into the handle after the magazine has been placed thereinto. The spring 31 bears against the stack of blades, so that they are constantly being pressed against the web 35 of the feeding plunger and against the adjacent side 36 of the hollow handle, when the feeding plunger is moved on its outward stroke as will hereinafter clearly appear.

The web 35 of the plunger is provided at its inner end with a feeding finger 37, and in alignment with the latter is formed in the head 38 of the handle a discharge opening 39 of a size to accommodate a single blade, said discharge opening registering with the blade supporting face of the blade holder when the latter is tilted on its pivot pin 12 into the position shown in Fig. 3 of the drawings, in which it forms a continuation of the said handles.

The operation of the elements so far described is, with the exception of that of certain elements, well known and may be briefly stated to be as follows: As appears from Fig. 1 of the drawings, the upper head of the blade container abuts against the head 38 of the razor handle and the blade spring 31 causes, as above described, the outermost blade to bear against the inner face of the web 35 of the plunger, when the latter is in its inner position as shown in Fig. 1 of the drawings. Assuming that the blade on the holder 13 is to be replaced by a new one, it is first necessary to swing the said holder into the position shown in Fig. 3 of the drawings. When now the plunger is taken hold of by the knob 29 and pulled out of the handle as far as the construction permits, the outermost blade is forced against the inner face of the side 36 of the handle above the feeding finger 37 and in line with the discharge opening 39. The plunger is then moved on its inward stroke, whereby the said blade is fed through the discharge opening 39 of the handle onto the blade holder 13, ejecting from the latter the used blade. It is obvious that the new blade acts as the ejecting means for the used blade. The notches 21 in the blade serve as positioning means for the latter, they being engaged by the clamping member 26, as appears from Fig. 5 of the drawings. In this manner, obviously, the cutting edge of the blade is at all times brought in proper relation to the guard of the device. The blade holder, with the blade thereon, is then swung around its pivot pin into the position shown in Fig. 1 of the drawings, whereby the razor is ready for operation.

Attention is called to the fact that the wings 24 extend somewhat beyond the ends of the blade, that is to say the blade is shorter than the distance between the outer faces of the two wings 24. For this reason, obviously, the ends of the cutting edges of the blade cannot injure the skin of the user no matter in what position the razor be swung on the face of the user. The grooves 25 in the guard bar 23 not only serve to prevent "ironing down" of the hairs on the face of the user during the shaving operation, but also permit the handle to be held at an acute angle to the face of the user, in contradistinction to devices of this type heretofore in use in which the handle

had to be held at right angles to the face which, obviously, not only results in a coarse shave but is also tiresome.

It is obvious that in the device so far described the feeding plunger may be actuated in any position of the blade holder of the razor. If, for instance, the elements are in the positions shown in Fig. 3 of the drawings, the feeding plunger may be repeatedly moved in and out of relation to the hollow handle, whereby a plurality of blades will be ejected from the latter and wasted, there being no provision made in the razor to insert an ejected blade into the magazine. On the other hand, when the blade holder is in any other position than in that shown in Fig. 3 of the drawings and the plunger is operated, a blade is partially ejected from the handle and causes jamming of the razor. This is sometimes so serious that the razor must be returned to the factory for adjustment and repairs. In order to prevent such occurrences, the feeding finger 37 is provided with a slot 40, for co-operation with a lug 41, carried by a spring 42, which is attached to the standard 11. The lug has a tendency to enter the slot 40 and does enter the same as soon as the blade holder 13 is swung a slight distance in the direction of the arrow shown in Fig. 3 of the drawings from the position illustrated therein. When the elements are in the positions shown in Fig. 3 of the drawings, the spring 42 is flattened out by the blade holder 13 and the lug 41 withdrawn from the slot 40 in the feeding finger 37. In these positions of the elements the plunger may be actuated, but in any other position the plunger is locked.

The construction so far described permits the feeding plunger to be operated irrespectives of the fact whether or not it has completed its stroke in either direction. Therefore, when a new blade is partly ejected from the magazine and the plunger returned to the end of its outward stroke and then again moved on its feeding stroke, a jamming takes place which cannot be cured without returning the device to the factory, where it must be completely disassembled and re-assembled. In order to prevent this, the razor is provided with means which prevents the feeding plunger to be moved in either direction unless its stroke has been completed. This means comprises, in the present embodiment of the invention, a pawl 43, disposed within a transverse recess 44 in the plug 32, said pawl being pivoted at 45 to the said plug and being under the action of a spring 46, the latter being disposed within said recess. The pawl co-operates with a row of apertures 47 in one of the flanges 48 of the channel-iron shaped feeding plunger, and is also adapted to co-operate with two openings 49 and 49′, one at each end of said row of said apertures and in alignment therewith. As appears from Fig. 8 of the drawings, the opening 49 is disposed adjacent the knob 29 and the opening 49′ adjacent the opposite end of the feeding plunger.

In the positions of the elements indicated in Fig. 9 of the drawings the feeding plunger is at the end of its outward stroke and the pawl 43 projects into the opening 49′. When now the said plunger is moved on its feeding stroke, the rear edge 50 of the opening 49′ shifts the pawl on its pivot in the direction of the arrow indicated in Fig. 9 of the drawings, the said opening being of sufficient width to permit tilting of said pawl in the manner indicated. In the continued inward movement of the plunger the pawl engages in succession the apertures 47, it being maintained in its tilted position until the opening 49 is brought into alignment with the said pawl, when the latter, under the action of its spring, again assumes a central position, that is to say the position shown in Fig. 9 of the drawings. It is to be noted that the apertures 47 are of a width which does not permit the said plunger to change its tilted position, that is to say they act as ratchet teeth, thereby preventing the said plunger to be moved in the opposite direction until the end of a stroke is reached. On the outward stroke of the plunger obviously the front edge 51 of the opening 49 causes the pawl to be tilted in a direction opposite to the arrow shown in Fig. 9 of the drawings, and the said pawl will be maintained in this position until the plunger arrives at the end of its outward stroke, when it is brought, by its spring, to central position as soon as it is adapted to project into the opening 49′. The arrangement herein described obviously prevents jamming of the device, as above pointed out. It is to be noted, however, that while herein a specific ratchet and pawl arrangement has been described, any other construction may be made use of without departing from the invention.

Similarly, it is to be noted that, while herein a specific lock for the plunger has been disclosed, in the form of the spring 42 and slot 40, any other construction may be made use of without departing from this feature of the invention, which lies mainly in the provision of a mechanism for preventing movement of the plunger unless the blade holder is in exact alignment with the magazine of the device.

It is to be observed that the spring 42 serves also as a means for closing the discharge opening 39 whenever the blade holder 13 is not in alignment with the razor handle 10, the lug 41 of the said spring projecting across the said discharge opening in such case. The advantage of this arrangement is that, if for some reason the feeding plunger is partially moved on its outward stroke before the blade holder is tilted into the posi-

tion shown in Fig. 1 of the drawings, or to any other position in which it is not in alignment with the razor handle, a new blade cannot be fed through the discharge opening until the blade holder is brought back to blade receiving position.

What I claim is:

1. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, and co-operating means on said handle and said feeding means for locking said feeding means against movement whenever said blade holder is not in true alignment with said handle.

2. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said feeding means being reciprocable, and co-operating means on said feeding means and said handle for allowing a change in the direction of movement of said feeding means at the ends of its strokes only.

3. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, a resilient blade clamping means on said blade holder overlying the same, each blade being provided with a V-shaped notch in each of its ends, the forward edge of each notch extending in parallel relation to the cutting edge of the blade, said blade clamping means being adapted to extend into the notches of a blade and engage the forward edges of said notches, thereby guiding the blade to shaving position as it is being fed from said handle to said blade holder.

4. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said handle having a discharge opening through which the blades are adapted to be fed, and means for closing said discharge opening in all positions of said blade holder save when it is in blade receiving position, said blade holder causing said closing means to recede from said discharge opening when shifted to blade receiving position.

5. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said feeding means being reciprocable, and a pawl mechanism on said handle co-operating with a series of holes in said feeding means for allowing the direction of movement of said feeding means to be changed only at the ends of its strokes.

6. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extending at an angle to said handle and being in blade receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said feeding means being reciprocable, and a pawl mechanism for allowing the direction of movement of said feeding means to be changed only at the ends of its strokes.

7. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, means for successively feeding blades from the stack toward said discharge opening, and co-acting means on said handle and said feeding means for preventing the latter from engaging and advancing a blade from the stack toward said discharge opening before the topmost blade of the stack has fully passed through said opening.

8. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable longitudinally on said handle for successively feeding blades from the stack toward said discharge opening, and a pawl mechanism permitting said plunger to move freely on its feeding stroke but preventing the same from returning to the starting point of its feeding stroke unless it has previously completed a feeding stroke.

9. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable across the mouth of said magazine for feeding the topmost blade from the stack toward said discharge opening, and a pawl mechanism for preventing said plunger from wholly uncovering the

mouth of said magazine unless it has previously completed a feeding stroke.

10. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a spring co-operating with said magazine for moving the blades out from said magazine into position to be fed, a plunger movable longitudinally on said handle having a finger for moving a blade from the stack toward said discharge opening, said spring acting when at the end of the idle stroke of said plunger said finger has wholly uncovered the mouth of said magazine, and a pawl mechanism for preventing said finger from uncovering the mouth of said magazine unless said plunger has previously completed a feeding stroke.

11. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extended at an angle to said handle and being in blade-receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, and means controlling said feeding means so as to prevent the operation of the latter unless said blade holder is in blade-receiving position.

12. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extended at an angle to said handle and being in blade-receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said feeding means being reciprocable, and means controlling said feeding means so as to allow the direction of movement thereof to be changed only at the ends of its strokes.

13. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable longitudinally on said handle for successively feeding blades from the stack toward said discharging opening, and means controlling said plunger so as to allow the same to move freely on its feeding stroke but preventing the same from returning to the starting point of its feeding stroke unless it has previously completed a feeding stroke.

14. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable across the mouth of said magazine for feeding the topmost blade from the stack toward said discharge opening, and means controlling said plunger for preventing the same from wholly uncovering the mouth of said magazine unless it has previously completed a feeding stroke.

15. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a spring co-operating with said magazine for moving the blades out from said magazine into position to be fed, a plunger movable longitudinally on said handle having a finger for moving a blade from the stack toward said discharge opening, said spring acting when at the end of the idle stroke of said plunger said finger has wholly uncovered the mouth of the said magazine, and means controlling said finger for preventing the same from uncovering the mouth of said magazine unless said plunger has previously completed a feeding stroke.

Signed at New York, in the county of New York, and State of New York, this 20th day of February, A. D. 1928.

JOSEPH MUROS.

CERTIFICATE OF CORRECTION.

Patent No. 1,917,209. **July 4, 1933.**

JOSEPH MUROS.

It is hereby certified that the above numbered patent was erroneously issued to the inventor said "Muros" whereas said patent should have been issued to "Frederick E. Perry, of New York, N. Y.," as assignee of the entire interest in said invention, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction there in that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of August, A. D. 1933.

M. J. Moore.

mouth of said magazine unless it has previously completed a feeding stroke.

10. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a spring co-operating with said magazine for moving the blades out from said magazine into position to be fed, a plunger movable longitudinally on said handle having a finger for moving a blade from the stack toward said discharge opening, said spring acting when at the end of the idle stroke of said plunger said finger has wholly uncovered the mouth of said magazine, and a pawl mechanism for preventing said finger from uncovering the mouth of said magazine unless said plunger has previously completed a feeding stroke.

11. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extended at an angle to said handle and being in blade-receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, and means controlling said feeding means so as to prevent the operation of the latter unless said blade holder is in blade-receiving position.

12. A razor comprising a handle adapted to contain a stack of blades, a blade holder pivoted to said handle being in shaving position when extended at an angle to said handle and being in blade-receiving position when shifted around its pivot to a position in which it forms a continuation of said handle, means for feeding blades successively from said handle to said blade holder, said feeding means being reciprocable, and means controlling said feeding means so as to allow the direction of movement thereof to be changed only at the ends of its strokes.

13. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable longitudinally on said handle for successively feeding blades from the stack toward said discharging opening, and means controlling said plunger so as to allow the same to move freely on its feeding stroke but preventing the same from returning to the starting point of its feeding stroke unless it has previously completed a feeding stroke.

14. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a plunger movable across the mouth of said magazine for feeding the topmost blade from the stack toward said discharge opening, and means controlling said plunger for preventing the same from wholly uncovering the mouth of said magazine unless it has previously completed a feeding stroke.

15. A razor including a handle provided with a discharge opening, a magazine within said handle adapted to hold a stack of blades, a spring co-operating with said magazine for moving the blades out from said magazine into position to be fed, a plunger movable longitudinally on said handle having a finger for moving a blade from the stack toward said discharge opening, said spring acting when at the end of the idle stroke of said plunger said finger has wholly uncovered the mouth of the said magazine, and means controlling said finger for preventing the same from uncovering the mouth of said magazine unless said plunger has previously completed a feeding stroke.

Signed at New York, in the county of New York, and State of New York, this 20th day of February, A. D. 1928.

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M. J. Moore.