Nov. 24, 1942. J. N. FREY 2,302,941

SHAVING DEVICE

Filed July 14, 1939

Fig. 1.

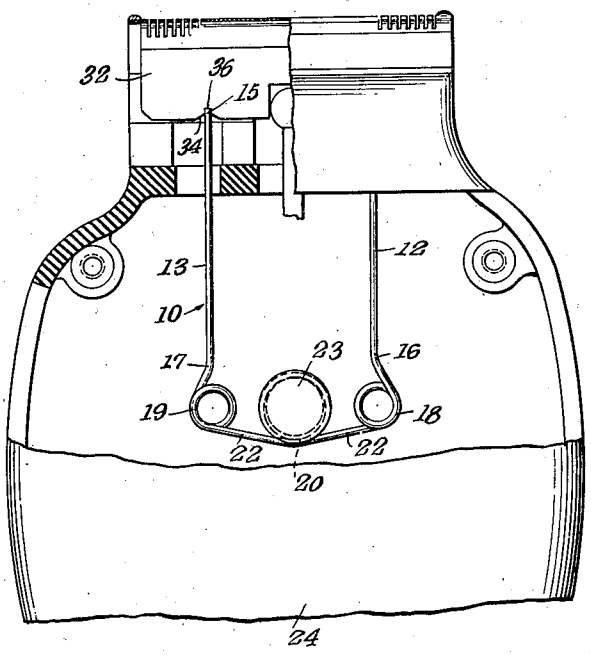


Fig. 2.

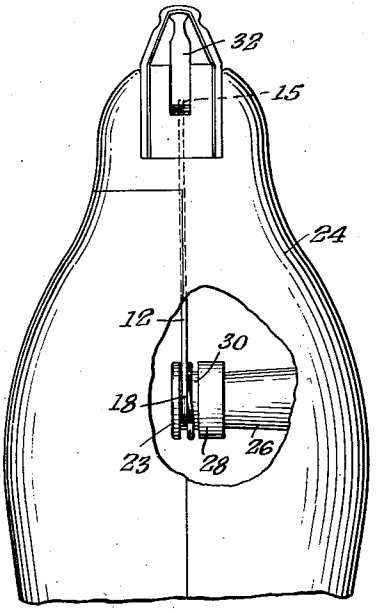


Fig. 4.

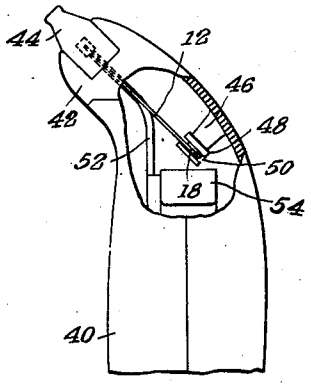
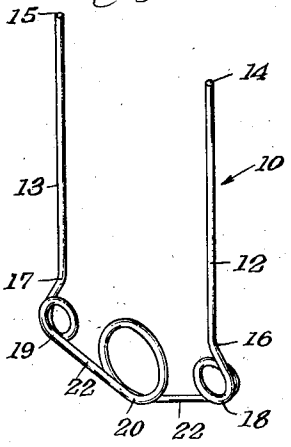


Fig. 3.



INVENTOR
J. NELSON FREY
BY Irving F. Goodfriend
ATTORNEY

Patented Nov. 24, 1942

2,302,941

UNITED STATES PATENT OFFICE

2,302,941

SHAVING DEVICE

John Nelson Frey, Union Township, Union County, N. J., assignor, by mesne assignments, to Samuel Gorad, New York, N. Y.

Application July 14, 1939, Serial No. 284,427

5 Claims. (Cl. 30—43)

The present invention relates to mechanically-operated shaving devices and more particularly to the spring means for maintaining the cutting elements thereof in operative cutting relation.

The present invention contemplates the provision of such a spring which, while maintaining the movable cutter and stationary cutter in operative relation, offers the minimum of resistance to the shaving movement of the movable cutter.

The present invention also contemplates the provision of such a spring which is durable, inexpensive to construct, easily assembled within the shaving device and which is furthermore economical and of extremely simple construction.

The present invention further contemplates in addition the relative arrangement of the spring and the various parts of the shaving device in a specific type of casing whereby a most practicable assembly is made.

Other advantages and uses of the present invention will be apparent from the following description and the drawing in connection therewith, in which

Fig. 1 is a front elevational view of a shaver, partly broken away, showing a preferred embodiment of the spring of the present invention as arranged therein.

Fig. 2 is a side elevational view of the device of Fig. 1, partly broken away.

Fig. 3 is a detailed perspective view of the spring shown in Figs. 1 and 2.

Fig. 4 is a side elevational view, partly broken away, of a shaving device illustrating the relative positioning of the above-mentioned spring and the cutter driving arm in a shaving device having a gooseneck casing construction.

The preferred embodiment of the spring of the present invention is preferably made of a single unitary metallic wire of spring material.

The spring 10 is provided with two substantially spaced, parallel arms 12 and 13, preferably long, the upper ends 14 and 15 of said arms being free. From the lower ends 16 of said long arms extend wire loops 18 and 19 formed from the same wire, these loops lying in the same plane as that in which both long arms together lie.

Referring now, particularly, to Fig. 3, it will be seen that the loops on the end of each arm are formed in different directions. The end loop 18 curves clockwise from the bottom 16 of the arm 12 and spirals towards the rear of the spring (as viewed in the drawing Fig. 3), whereas the end loop 19 curves counterclockwise from the bottom 17 of the arm 13 and spirals upwards towards the front of the spring (as viewed in the drawing Fig. 3). The spiraling of the two loops 18 and 19 in opposite directions results in a more balanced spring as will be hereinafter more apparent.

The two end loops 18 and 19 are connected together to a center loop 20, which is arranged intermediate thereof by means of the substantially horizontal legs 22. Said center loop 20 lies in the same plane as the end loops 18. It is to be noted that the center loop 20 may be made larger than the end loops 18 and 19, and the legs 22 may be shorter than the parallel arms 12 and 13. One of the reasons for making the center loop 20 rather large is that this is the loop by which the spring may be arranged within the shaving device casing and this loop must be large enough to fit over the member on which it is arranged, as will be described hereinafter.

It is to be noted that the bottom of the center loop 20 is disposed below the end loops 18 and 19 and that the legs 22 slant downward from these end loops at the bottoms thereof. One reason for this arrangement is to have the central loop and the legs 22 press the end loops and the long arms upwardly. Other reasons will be apparent from the description following.

Referring now to Figures 1 and 2, the arrangement of said spring within a shaving device will next be described.

Such devices usually have a casing 24 which is molded from some plastic or other suitable material. During the molding of the casing, a boss 26 may be formed extending from a wall of the casing. A metal, and preferably brass stud 28 may be permanently arranged therein during the molding of the casing. Said stud 28 may have formed therein an annular channel-shaped recess 30. It is preferred that the recess 30 be aligned with the center of the movable cutter member 32 of the shaving head, which shaving head is arranged on the end of the casing. The spring 10 is arranged on the stud 28 by snapping the center loop 20 thereon and arranging it within the recess 30, which recess is of a diameter slightly greater than that of the central loop. The inherent elasticity of the center loop 20 causes it to contract within the recess 30 and thereby retain the spring on said stud 28. The arms 12 of the spring 10 pass through appropriate apertures in the casing and in the shaving head and are so disposed that their upper ends 14 enter inverted V-shaped notches 34 in the bottom of the movable cutter 32 and are main-

tained in engagement with said movable cutter 32 by providing recesses 36 at what is substantially the apex of the inverted V-shaped notches 34 and disposing said ends 14 therein. It will be seen that while the arrangement of the upper ends 14 and 15 of the arms 12 within the recesses 36 serves to fixedly retain them in engagement with the bottom of the movable cutter 32, that the inverted V-shaped notches 34 prevent any binding of the movement of the cutter because of such arrangement of the arms of the spring therein.

It is, of course, to be understood that the arms 12 and 13 are so long that when the spring is arranged in the casing as hereinbefore described, the ends of said arms press upwardly against the bottom of the movable cutter, to thereby maintain it in operative contact with the face-contacting member.

It will be seen that the metallic member 28 on the boss 26 presses upwardly against the top of the center loop 20 thereby leaving the side and bottom portions of said loop free to flex.

It will further be seen that the end loops 18 and 19 serve as pivots on which the arms 12 and 13 swing.

It will be apparent that when the ends 14 and 15 of the arms 12 move, the end loops 18 and 19 do not bend at one point but that at all points on the entire curve of each loop there is a slight change in curvature. It will, therefore, be seen that because of the looped structure of the ends of the arms 12 and 13 they move very readily without binding.

It will, of course, be understood that my novel spring may assume other forms, it only being necessary to so bend or form the wire as to provide the flexibility desired. For example, if the wire is thin enough, and, therefore, flexible enough, the end loops 18 and 19 may be dispensed with, the wire merely being bent at the ends of the arms 12 and 13 to form the legs 22 which merge into the centre loop 20. Further, the end loops 18 and 19 may be arranged transversely of the arms 12 and 13 in the form of the conventional spring coil and if desired more than one loop or coil may be provided.

Such loops or coils may be positioned either on the arms 12 and 13 or the legs 22. Instead of loops or coils one or more crimps may be made in the wire at the positions of the loops 18 and 19.

It will be further understood that the centre loop may likewise assume different suitable forms, it being necessary only to provide a means for securing the spring to the casing so that the legs and arms thereof urge the movable cutter 32 against the stationary cutter.

Referring now to Fig. 4, a particularly advantageous arrangement of the spring and various parts of the razor will now be described.

A casing 40 may be provided having a gooseneck 42 on which the shaving head 44 is arranged. A boss 46 is molded with the casing and, as heretofore described in relation to Figures 1 and 2, has a metallic stud member 48 having a recess 50 on which the spring 10 heretofore described is arranged. The spring 10 is arranged on the stud 48 so that it lies in a plane through the longitudinal axis of the cutter and perpendicular to the plane of motion thereof.

A driving arm 52 for reciprocating the movable cutter is arranged on the side of the motor 54 opposite the side on which the boss is arranged and which arm is bent substantially in conformity with the bend of the gooseneck. It will be seen that because of the relative position of the boss and the connecting arm 52 that the connecting arm does not have to be bent to pass the boss, but instead is arranged so that it is bent in conformity with the gooseneck into proper alignment with the cutter.

The spring itself, as is apparent, need not be bent in any way to conform to the gooseneck shape, but lends itself to ready adaption to any form of casing and arrangement of motor and cutter.

It is to be noted that the boss is arranged on one side of the casing and that the driving arm is arranged toward the other side of the casing.

It will thus be seen that I have provided a simple, convenient arrangement of the parts of a shaving device in a gooseneck casing, particularly the relative arrangement of the spring member and the driving member.

It will be apparent that I have provided a spring which is formed from a single wire and which is extremely simple to construct and comparatively inexpensive to manufacture. It will be further apparent that such a spring provides an equal pressure against the two ends of the movable cutter while at the same time furnishing the flexibility and unrestrained action of the more complex and expensive multi-element mechanism of the prior art.

While I have described my invention in detail with specific examples, it will be understood that such examples are illustrative and are not given as limitations since other modifications within the spirit and scope of my invention will be apparent to those skilled in the art. Hence, the invention is to be understood as limited only as indicated, in the appended claims, in which the intent is to set forth all the novelty over the prior art.

I claim:

1. In a shaving device, a casing having a gooseneck at one end thereof and a boss mounted in the interior of the casing on one side thereof, a shaving head, mounted on said gooseneck, comprising a movable cutter and a cooperating member, an integral spring member comprising spaced arms arranged to engage the movable cutter at one end thereof, loops formed at the end of the spring arms opposite the end engaging the movable cutter, and a central loop intermediate said loops and mounted on said boss; motor means within the casing for driving said movable cutter and a connecting driving arm arranged in said casing, said arm being adpated to engage the movable cutter intermediate the spring arms, said boss extending from the casing a sufficient distance inwardly thereof to dispose said spring member in the plane of motion of the cutter.

2. In a shaving device having cooperating cutter members, one of which cutter members is moved relatively to the other member in the cutting operation, a spring for maintaining the movable member in operative cutting relation with the other cutter member comprising a single integral strand of wire of spring material having a pair of spaced, substantially parallel arms, each of said arms being free at its upper end and each arm engaging the movable member at the upper end thereof, said arms each terminating at the lower end thereof in a loop and a central loop intermediate the end loops.

3. In a shaving device having a shaving head comprising a stationary member and a movable cutter having recesses at the bottom thereof, said

device also having a casing provided with a boss therein, the shaving head mounted on the casing, a spring for the shaving head mounted in the casing on said boss, said spring comprising a single strand of wire having a central loop disposed on the boss, a pair of legs diverging from said loop, end loops respectively mounted on said legs and extending from said central loop, spaced parallel straight arms respectively extending upwardly from said end loops, the upper ends of said arms disposed within the recesses at the bottom of the movable cutter, said spring being arranged to press upwardly against the movable cutter to maintain it in movable shaving relation with the said stationary member.

4. In a shaving device having a casing and a cutter member mounted on said casing and a movable cutter arranged adjacent said cutter member and movable with respect thereto for shaving, a spring for the movable cutter mounted within the said casing to maintain said movable cutter in cutting relation to the cutter member, said spring comprising a single strand of wire having a central loop by which said spring is mounted on the casing, end loops connected to said central loop, a pair of parallel, straight arms extending upwardly from said end loops, the upper ends of said arms being free and resting against the said movable member to urge it against the cutter member.

5. Tension means for maintaining the cooperating cutter members of a shaving device in which the cutter members are mounted on a casing thereof, said tension means comprising a single strand of wire of spring material formed into a pair of spaced parallel straight arms, the ends of said straight arms being free and arranged against one of the said members, the wire being bent at the ends of the arms opposite the member engaging ends thereof to form legs extending inwardly from the arms, which arms thereby extend upwardly from the legs and said wire being formed intermediate said arms into means whereby the said tension means may be secured to the casing.

JOHN NELSON FREY.