United States Patent [19]

Maruyama

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[54] **LIGHTER**

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[52] **U.S. Cl.** **431/132,** 431/130, 431/255

[51] **Int. Cl.**.....**F23q 2/08**

[58] **Field of Search**.....431/130, 131, 132, 431/143, 150, 255, 139, 140

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Carroll B. Dority, Jr.
Attorney—Edgar H. Kent

[57] **ABSTRACT**

Cigarette lighter with an improved system for depressing a plunger to ignite a burner, comprising a thumb operated member carrying a bearing positioned adjacent a transverse surface of the plunger, the member having a path of movement carrying the bearing against and along the plunger surface while depressing the plunger.

8 Claims, 3 Drawing Figures

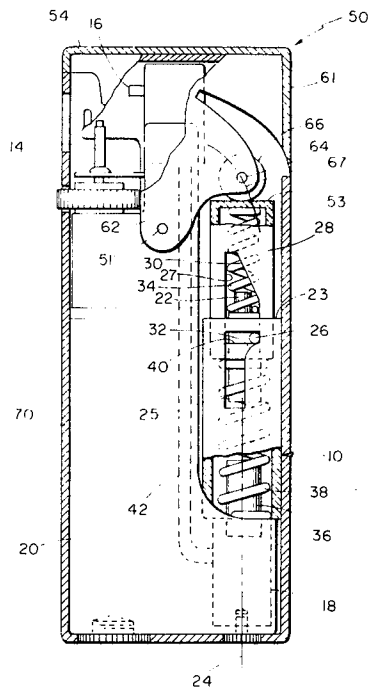


FIG. 1

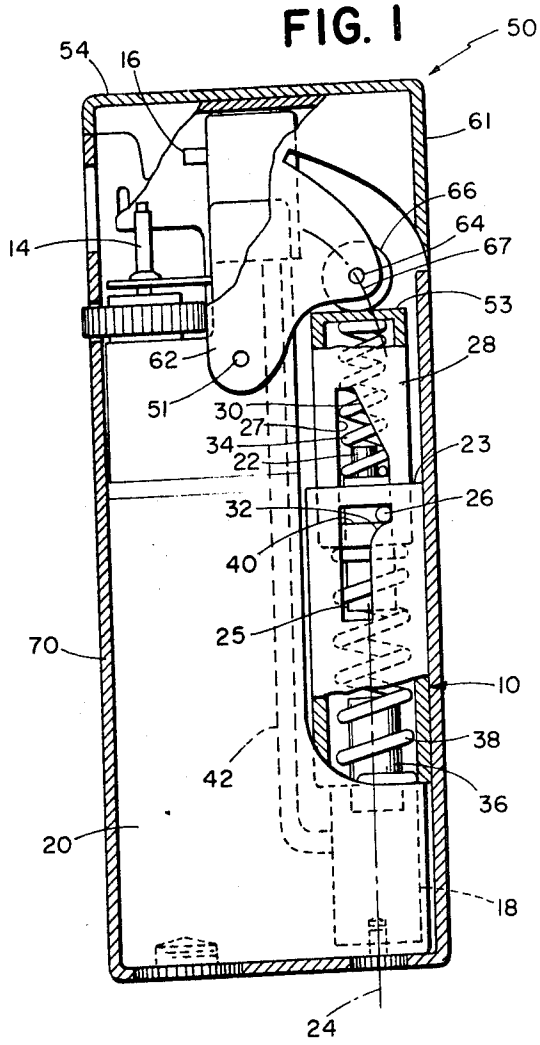
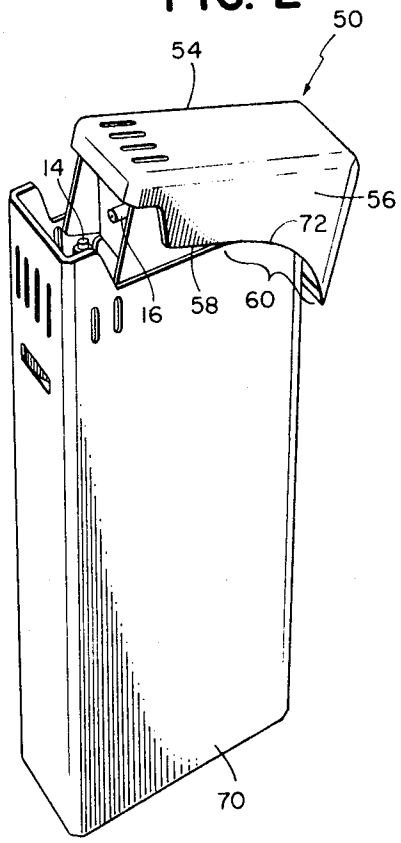


FIG. 2



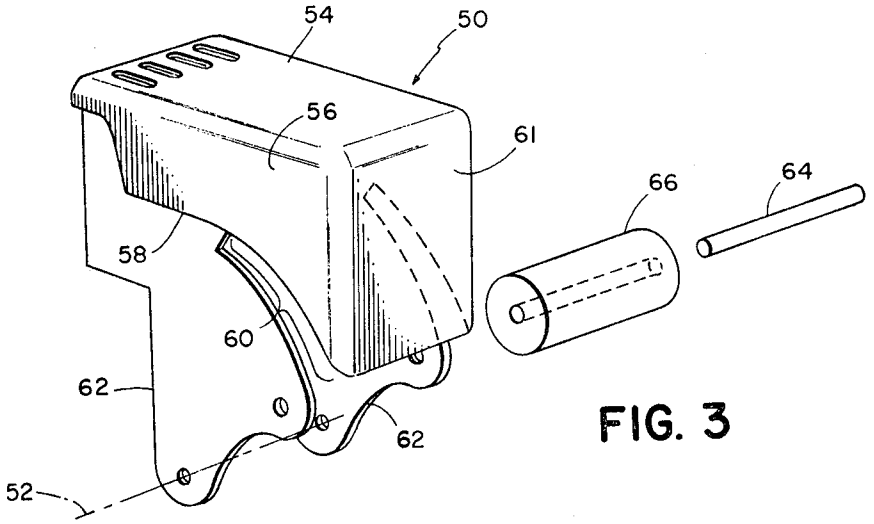


FIG. 3

LIGHTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to cigarette lighters of the sort in which manual pressure on an external surface simultaneously exposes and actuates the burner.

2. Description of the Prior Art

Such lighters typically require either downward or oblique movement of the external actuating member. Often a piezoelectric ignition system is provided, and the movement of the actuating member trips a hammer which strikes the piezoelectric element.

SUMMARY OF THE INVENTION

The invention provides an attractive lighter that can be smoothly, easily, and effectively operated with relatively little thumb pressure.

In general the invention features, in a lighter having a burner which ignites upon depression of a plunger along an axis, an improved system for depressing the plunger, comprising a thumb operated member, and a bearing carried by the member and positioned adjacent a surface of the plunger, the surface being transverse to the plunger axis, the thumb operated member being mounted on the lighter for movement along a path carrying the bearing against and along the plunger surface while depressing the plunger. In preferred embodiments the thumb operated member is a cover pivoted to the lighter and the path is along a circular arc; the pivot for the member lies between the extremes for travel of the plunger surface; the bearing is a roller; and the lighter body is disposed in a shell the sides of which terminate in upper edges including curved portions, and the thumb operated member has sides having lower edges including curved portions mating with the curved portions of the shell edges, the thumb operated member further having ears extending between the body and the shell, the ears carrying the roller and being pivoted to the body.

Other advantages and features of the invention will be apparent from the description and drawing herein of a preferred embodiment thereof.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a sectional view, partly broken away, of a lighter, with its cover closed;

FIG. 2 is an isometric view, in reduced scale, of the lighter of FIG. 1; and

FIG. 3 is an exploded view of selected elements of the lighter.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, a lighter is shown having piezoelectric ignition system including a hammer unit **10** and electrodes **14** and **16**, electrode **14** also forming the burner nozzle connected to a gaseous fuel supply (not shown). The hammer unit **10** is supported on a base **18** at the back of lighter body **20** and includes a shell **23** in which fits, in telescope fashion, plunger **28**, for movement along axis **24**. Hammer **22** is inside both the shell and the plunger, and carries pins **26** (on opposite sides, only one shown) which protrude through overlapping slots **25** and **27** in the shell and plunger, respectively (again, only one pair of slots shown).

A coil spring **34** is mounted in plunger **28** bearing at one end against an enlarged portion of hammer **22** and at the other end against the top of the plunger. A larger diameter coil spring **38** is mounted in shell **23** bearing at one end against base **18** surrounding a piezoelectric element **36** on base **18** and at the other end bearing against plunger **28** and surrounding the lower end of hammer **22**. Slots **25** have cam edges **32** which act against pins **26** to hold the hammer up. Slots **27** have sloping edges **30** which, when the plunger is depressed, pivot pins **26** away from edges **32** to allow spring **34** to snap the hammer down against piezoelectric element **36** within spring **38**. Spring **38**, biasing plunger **28** upwardly, returns the hammer unit to its original position upon release of the plunger, with bottom edges **40** of slots **27** acting to raise pins **26**. Piezoelectric element **36** is connected to electrode **16** through wire **42**.

The arrangement described thus far is known. The invention provides for depression of plunger **28** by thumb operated cover **50** pivoted on pins **51** to body **20** for rotation above axis **52** (FIG. 3) located forward of hammer unit **10** and vertically between the upper and lower extremes of travel of the top surface **53** of plunger **28**. Cover **50** consists of a flat top **54** which, when the cover is closed, extends across the entire lighter body, sides **56** which have lower edges **58** the rear portions **60** of which are circular arc shaped, a flat back **61** which extends down to the ends of edges **58**, and ears **62** which extend downwardly from edges **58** but are offset inwardly from sides **56**. Ears **62** are pivoted to body **20** at axis **52** and also carry an axle **64** on which is freely mounted roller **66**. When the cover is closed roller **66** rests on plunger surface **53**.

Outer shell **70** of the lighter covers ears **62** when the cover is closed, and its upper edges mate with the lower edges of the cover. In particular, circular arc shaped edges **72** are adjacent edge portions **60**.

The lighter is operated by thumb pressure against cover top **54** in the region above plunger **28**. As the cover opens it opens a valve (not shown) connecting burner **14** to the fuel supply, in conventional fashion. The cover pivots about axis **52**, arc shaped edges **60** and **72** slide against each other, and roller **66** moves downwardly and slightly rearwardly over plunger surface **53** (with axle **64** following arc **67**, FIG. 1), depressing the plunger to actuate the hammer unit and provide a flame. Upon release of the cover, the plunger return causes roller **66** to reverse its motion, automatically closing the cover. The use of pin **51** as a fulcrum provides excellent leverage, and roller **66** provides very smooth action.

Other embodiments are within the following claims.

I claim:

1. In a lighter having a burner which ignites upon depression of a plunger along an axis, an improved system for depressing said plunger, comprising

a thumb operated member mounted on said lighter and

a bearing carried by said member and having a position adjacent a surface of said plunger, said surface being transverse to said axis,

means mounting said member on said lighter for movement along a path carrying said bearing against and along said plunger surface while depressing said plunger.

2. The lighter of claim **1** wherein said path is curved.

3. The lighter of claim **1** wherein said member is piv-

oted to said lighter and said path is along a circular arc.

4. The lighter of claim **3** wherein said thumb operated member provides a cover for said burner.

5. The lighter of claim **3** wherein the pivot for said member lies between the extremes of travel of said plunger surface and to one side thereof.

6. The lighter of claim **1** wherein said bearing is a roller.

7. The lighter of claim **1** further comprising a body disposed in a shell the sides of which terminate in upper

edges including curved portions, and said thumb operated member has sides having lower edges including curved portions mating with said curved portions of said shell edges, said thumb operated member further having ears extending between said body and said shell, said ears carrying said bearing and being connected to said body.

8. The lighter of claim **7** wherein said ears are pivoted to said body and said bearing is a roller.

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Dedication

3,734,680.—*Susumu Maruyama*, Tokyo, Japan. LIGHTER. Patent dated May 22, 1973. Dedication filed Mar. 5, 1975, by the assignee, *Park Lane Associates, Inc.*

Hereby dedicates to the Public the entire term of said patent.

[*Official Gazette July 15, 1975.*]