United States Patent [19]

Levasseur

[11] **3,919,508**

[45] **Nov. 11, 1975**

[54] **BUCKLE HOUSING**

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[73] Assignee: **Allied Chemical Corporation**, New York, N.Y.

[22] Filed: **Feb. 12, 1974**

[21] Appl. No.: **441,913**

[52] **U.S. Cl.** ..... **200/61.58 B**; 24/230 AL

[51] **Int. Cl.** **A44b 11/26**; H01h 3/16

[58] **Field of Search** .... 24/230 A, 230 AU, 230 AL, 24/230 AK, 230 AM, 230 AN, 230 AP, 230 AJ; 200/61.58 B

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Primary Examiner—Bernard A. Gelak

Attorney, Agent, or Firm—Ernest D. Buff; John P. Kirby, Jr.

[57] **ABSTRACT**

A safety belt buckle is provided with a housing formed of a plurality of laminated plates. The top and bottom plates have an opening in the central portion thereof. Spaced apart parallel walls of the center plate form a guide means for guiding the tongue of a seat belt into the housing. The housing is small, light, strong, easy to fasten, comfortable to wear and inexpensive to produce.

7 Claims, 4 Drawing Figures

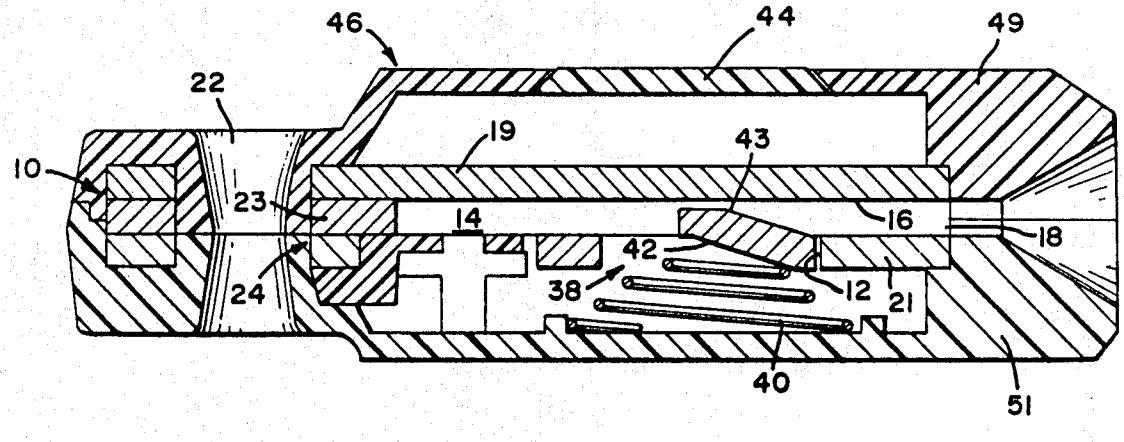


FIG. 1

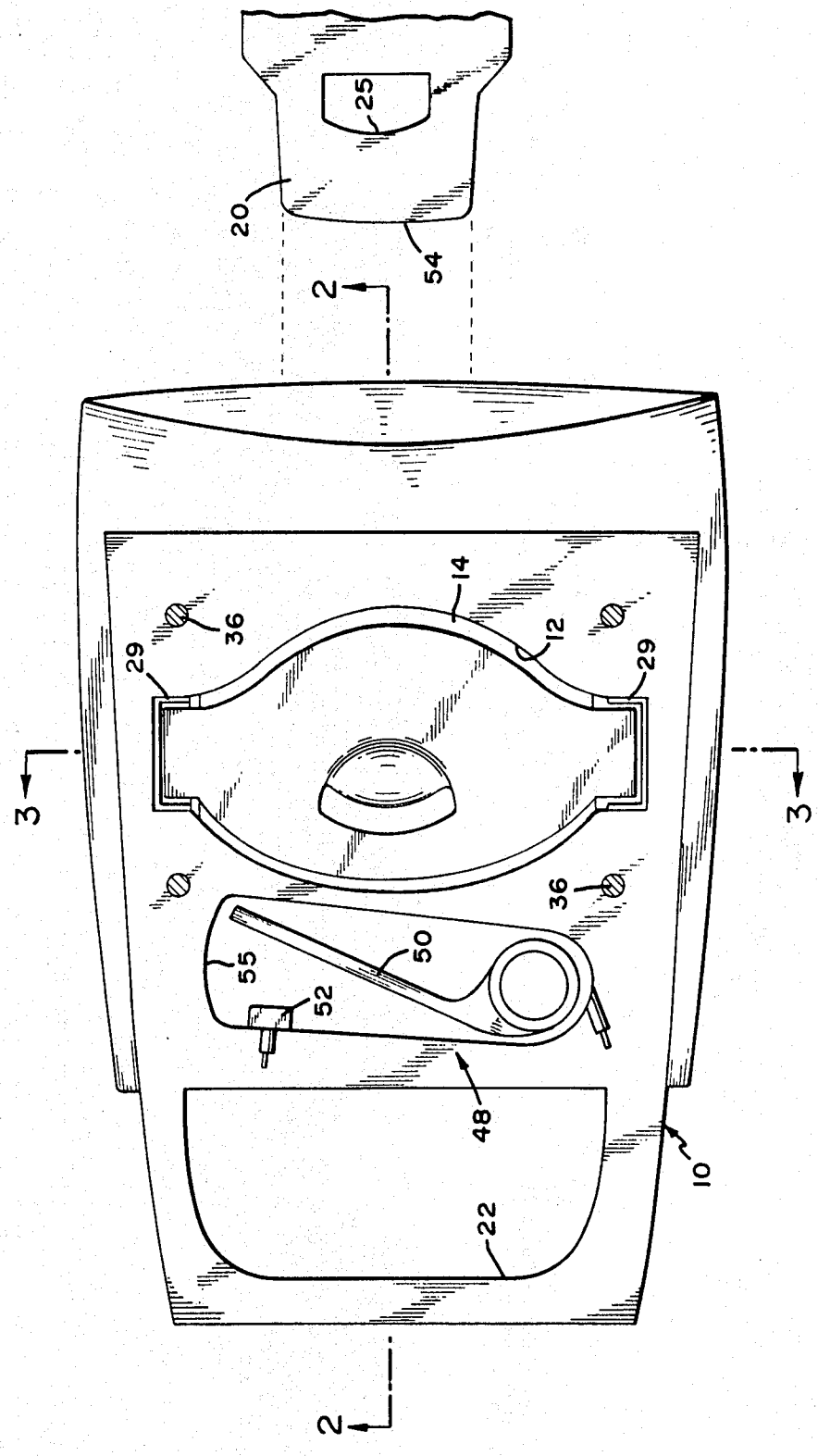


FIG. 2

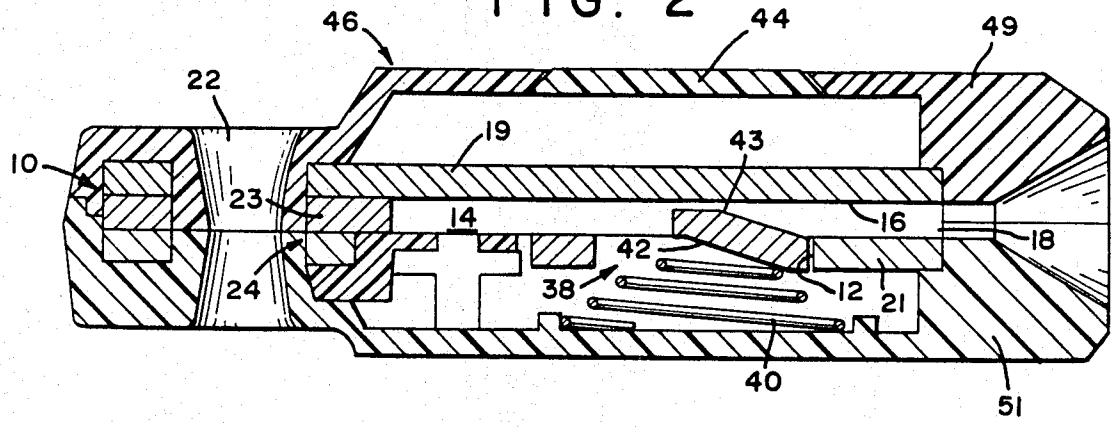


FIG. 3

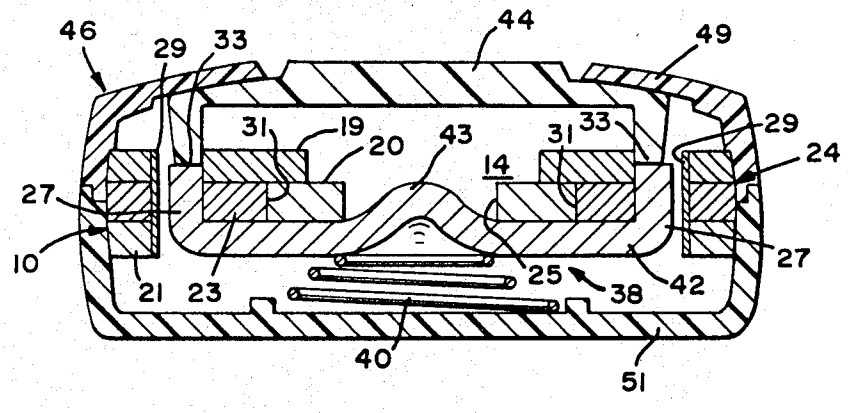
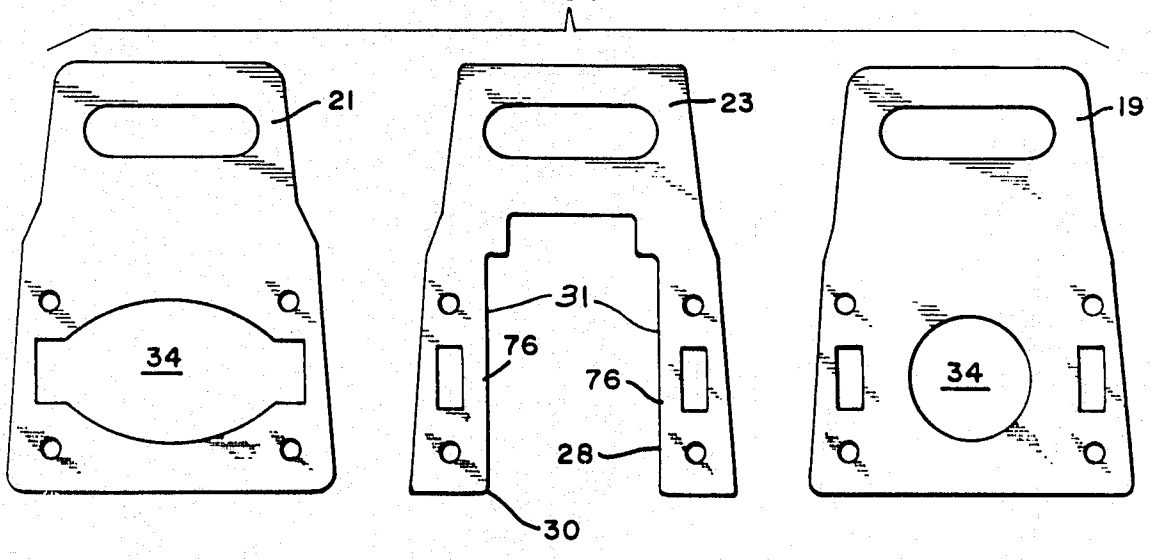


FIG. 4



BUCKLE HOUSING

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to safety belt buckles for passengers in vehicles such as automobiles, and more particularly to improved means for housing and facilitating the operation of the components of the buckle.

2. Description of the Prior Art

Safety belt buckles have been developed in order to reduce the number of fatalities and serious injuries resulting from motor vehicle accidents. Most of these buckles include, as major components, a unitary housing connected to a seat belt anchored to the vehicle body and a latching mechanism adapted to coact with the tongue of another seat belt assembly similarly secured to the vehicle. One of the problems encountered with such buckles is the difficulty of inserting the tongue into the housing. The rough entry caused by "hard points" encountered in the housing during insertion of the tongue either deters vehicle occupants from using safety belts or leads them to believe that their belt is fastened when, in fact, it is not. Another problem encountered with such buckles is the relatively large size, weight and cost thereof. The present invention provides a means whereby the aforesaid problems are overcome.

SUMMARY OF THE INVENTION

In accordance with the present invention a safety belt buckle housing is provided that is compact, lightweight and strong, and which virtually eliminates fastening problems such as rough entry, false latch and the like. The housing has an opening therein from which a cavity extends to a wall opposite the opening. An inlet means of the housing communicates with the cavity for receiving the tongue of a seat belt. A connecting means is provided for connecting the housing to the seat belt. The housing is formed of a plurality of laminated plates. The top and bottom plates have an opening in the central portion thereof and the center plate has an opening extending from an edge of the plate into the central portion thereof. Spaced apart parallel walls of the center plate form a guide means for guiding the tongue into the cavity of the housing.

The buckle housing of this invention has advantageous structural features. Each of the plates are easily fabricated and relatively strong. Thus, the housing is quickly and easily assembled at minimal cost to form a remarkably sturdy unit. Hart points within the housing cavity are replaced by a smooth guiding surface provided by the guide means. In addition, means are provided for effecting and maintaining proper alignment between the latching means and tongue of the buckle assembly. As a result, safety belt buckles equipped with the housing of this invention are less expensive to produce, easier to fasten, more comfortable to wear and afford greater protection to vehicle occupants than previous safety belt buckles.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more fully understood and further advantages will become apparent when reference is made to the following detailed description and the accompanying drawings in which:

FIG. 1 is a plan view of the safety belt buckle, including the housing of this invention;

FIG. 2 is a longitudinal section taken along line 2—2 of FIG. 1;

FIG. 3 is a section taken along the line 3—3 of FIG. 1; and

FIG. 4 is a plan view of a plurality of plates adapted for assembly to form the housing of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1–3 of the drawings, there is illustrated a safety belt buckle including the housing of this invention. The housing, shown generally at **10**, has an opening **12** therein from which a cavity **14** extends to a wall **16** of the housing opposite the opening **12**. Housing **10** is provided with an inlet means **18** which communicates with the cavity **14** for receiving the tongue **20** of a seat belt (not shown). The housing **10** has connecting means **22** for connecting the housing to the seat belt. Housing **10** is formed of a plurality of laminated plates shown generally at **24**. As shown in FIG. **4**, the top and bottom plates **19** and **21**, respectively, have an opening **34** in the central portion thereof and the center plate **23** has an opening **28** extending from an edge **30** of the plate into the central portion thereof. The center plate has a guide means **31** for guiding the tongue **20** into the cavity **14** of the housing **10**.

The number of laminated plates employed can vary depending on the depth of the cavity and the type of material of the plates. Typically, the plates are die-stamped from metal such as mild steel, aluminum, or the like. Preferably the housing **10** is comprised of at least three plates and the opening in the top plate has a circular shape. Each of the plates **19**, **21** and **23** are die-stamped using conventional equipment at very low cost.

The housing is assembled by sandwiching bottom and top plates **19** and **21**, respectively about center plate **23** and fastening the assembled plates together by mechanical fastening means, such as rivets **36**. The plates can, alternatively, be spot-welded or adhesively secured together using suitable epoxy resins or the like. Upon assembly of the plates to form an integral laminated housing unit, guide means **31** is formed by spaced apart parallel walls **76** of which center plate **23** is comprised. The walls **76** cooperate with the tip **54** of tongue **20** to eliminate rough entry of the tongue during its insertion into cavity **14**.

Referring to FIGS. **1–3** of the drawings, a latching means and cover are shown in relation to the housing **10**. The latching means, shown generally at **38**, includes a biasing means **40**, a latch bar **42** having a raised portion **43** adapted to mate with opening **25** of tongue **20**, and a pushbutton **44**. The latch bar **42** has a plurality of arms **27** adapted to move within heat treated steel inserts **29**. These components are disposed in the cavity **14** with at least portions thereof positioned in serial overlapping relationship in the direction in which the cavity extends into the housing. Preferably, a cover, generally indicated at **46**, is disposed about the housing **10**. The cover **46** comprising a plurality of pieces **49** and **51** of light weight plastic or the like. Cover **46** does not add appreciably to the strength or weight of the assembly but functions primarily to protect the components therein against contamination and accidental damage due to tampering. The cover **46** has sufficient strength and rigidity to withstand forces generated during depression of the push-button **44**, and

may, therefore, be used to support the biasing means 40.

A switch means, shown generally at 48, comprising a movable contact arm 50 connected to a source of electrical power and adapted to be moved into contact with a contact member 52 connected to starter engine interlock and/or alarm circuitry of the vehicle may also be associated with the housing 10. The switch means 48 is preferably disposed in a second cavity 55 of the housing 10 so that arm 50 is pushed against the force of a spring (not shown) and into contact with contact member 52 by the tip 54 of tongue 20 upon insertion of the tongue 20 into the housing 10.

In operation, the tongue 20 is inserted into inlet means 18 and cavity 14, bringing opening 25 above raised portion 43 of latch bar 42. The biasing means 40 moves the raised portion 43 into locking engagement with opening 25 of tongue 20. The tip 54 of tongue 20 pushes arm 50 of switch means 48 into contact member 52, whereby an electrical signal is transmitted to circuitry for disabling the engine interlock and/or alarm means of the vehicle. To disengage the belt, push-button 44 is depressed. Shoulders 33 of the button force latch bar 42 downward until the raised portion 43 is below the opening 25 of tongue 20.

Having thus described the invention in rather full detail, it will be understood that these details need not be strictly adhered to but that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

I claim:

1. A safety belt buckle having a housing therein, said housing having an opening therein and provided with a cavity extending from said opening to a wall of said housing opposite said opening, inlet means communicating with said cavity for receiving the tongue of a seat belt, connecting means for connecting the housing to the seat belt, movable latching means for engaging said tongue, and manually operable actuation means for actuating said latching means, said housing formed of at least three laminated plates in contact with one another and secured together, said laminated plates including a first plate, a second plate, and a third plate, said second plate disposed between said first plate and said third plate, each of said plates having an opening in the central portion thereof, said openings in substantial alignment with one another, at least said second plate having a slot therein extending from an edge of said second plate into the central opening thereof for receiving said tongue, a portion of said latching means extending in and movable within said openings of at least said second plate and said third plate, a portion of said actuating means extending in and movable within said opening of at least said first plate, said second plate having guide means for guiding said tongue into said housing, said guide means having spaced apart, approximately parallel walls.

2. A safety belt buckle as recited in claim 1, wherein said housing has fastening means for fastening said plates together to form an integral laminated housing unit.

3. A safety belt buckle as recited in claim 1, wherein the number of laminated plates is at least three.

4. A safety belt buckle as recited in claim 1, wherein the opening in said first plate has a circular shape.

5. A safety belt buckle as recited in claim 1 and further comprising a switch means disposed in said housing and adapted to indicate when the tongue has been properly engaged in said housing.

6. A safety belt buckle according to claim 5 wherein said switch means comprises:

a movable contact arm;

a contact member; and

a biasing means, biasing said movable contact arm away from said contact member;

said tongue upon insertion into said buckle housing being adapted to move said contact arm into electrical contact with said contact member, thereby closing an electrical circuit.

7. A safety belt buckle according to claim 1 wherein said manually operable actuation means is a push button extending into said opening of said first plate and connected to said latch means, said push button being the sole mechanism for releasing said tongue from said buckle housing.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,919,508 Dated November 11, 1975

Inventor(s) Dornis Levasseur

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The drawing figures should be canceled and substituted with the attached drawings therefore.

Signed and Sealed this

Eighth Day of February 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks

FIG. 1

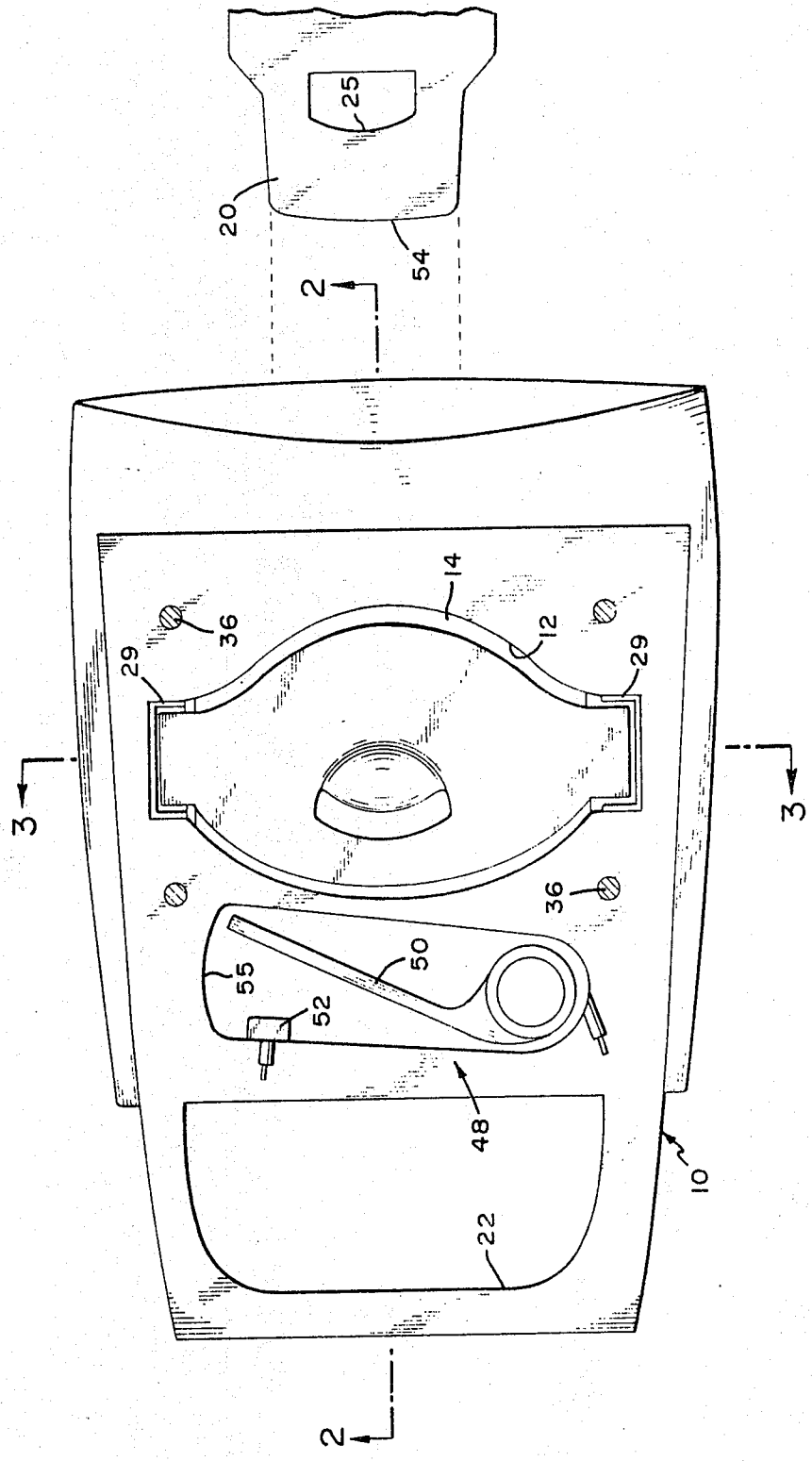


FIG. 2

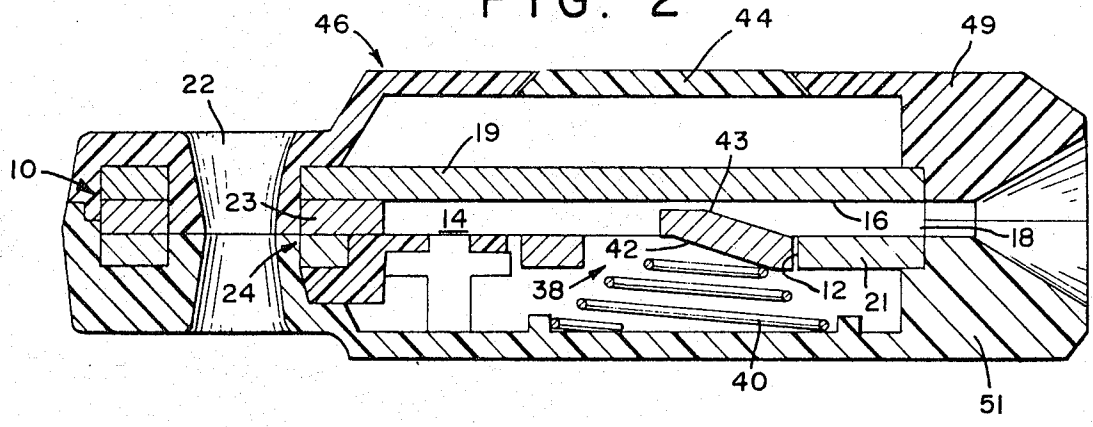


FIG. 3

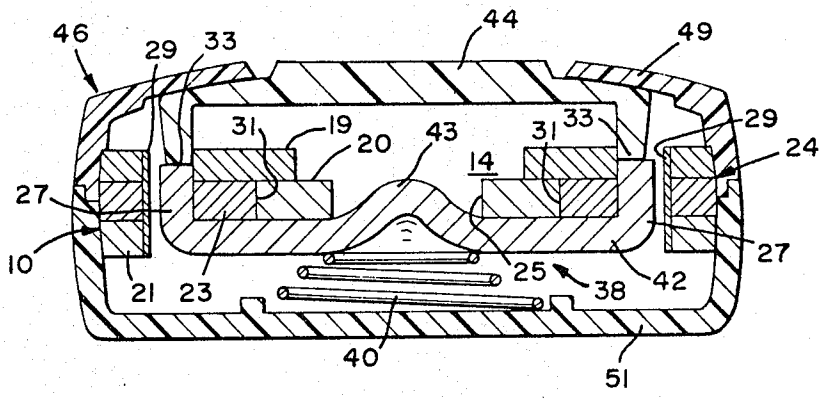
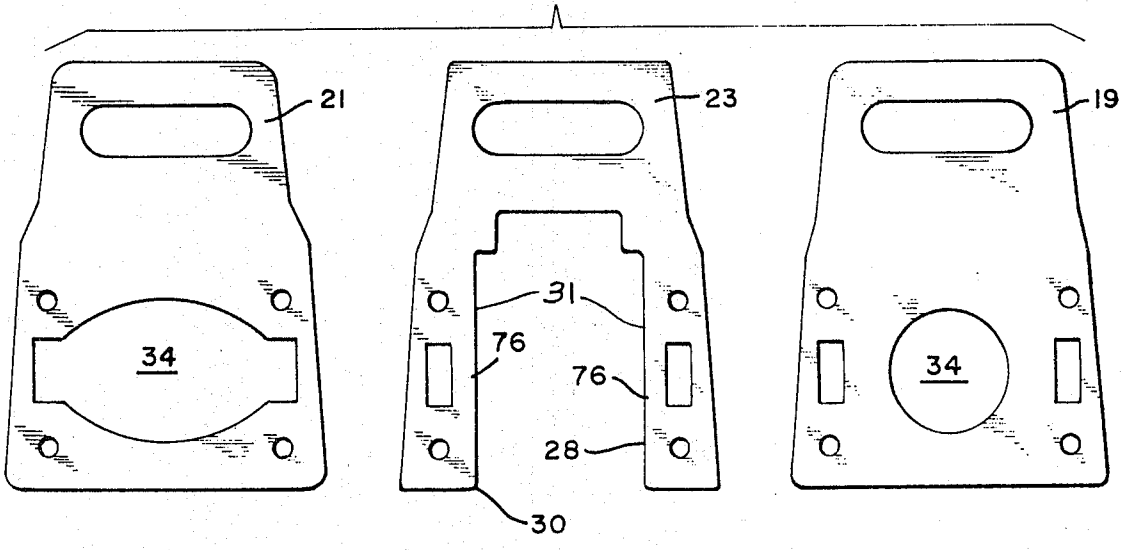


FIG. 4



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FIG. 1

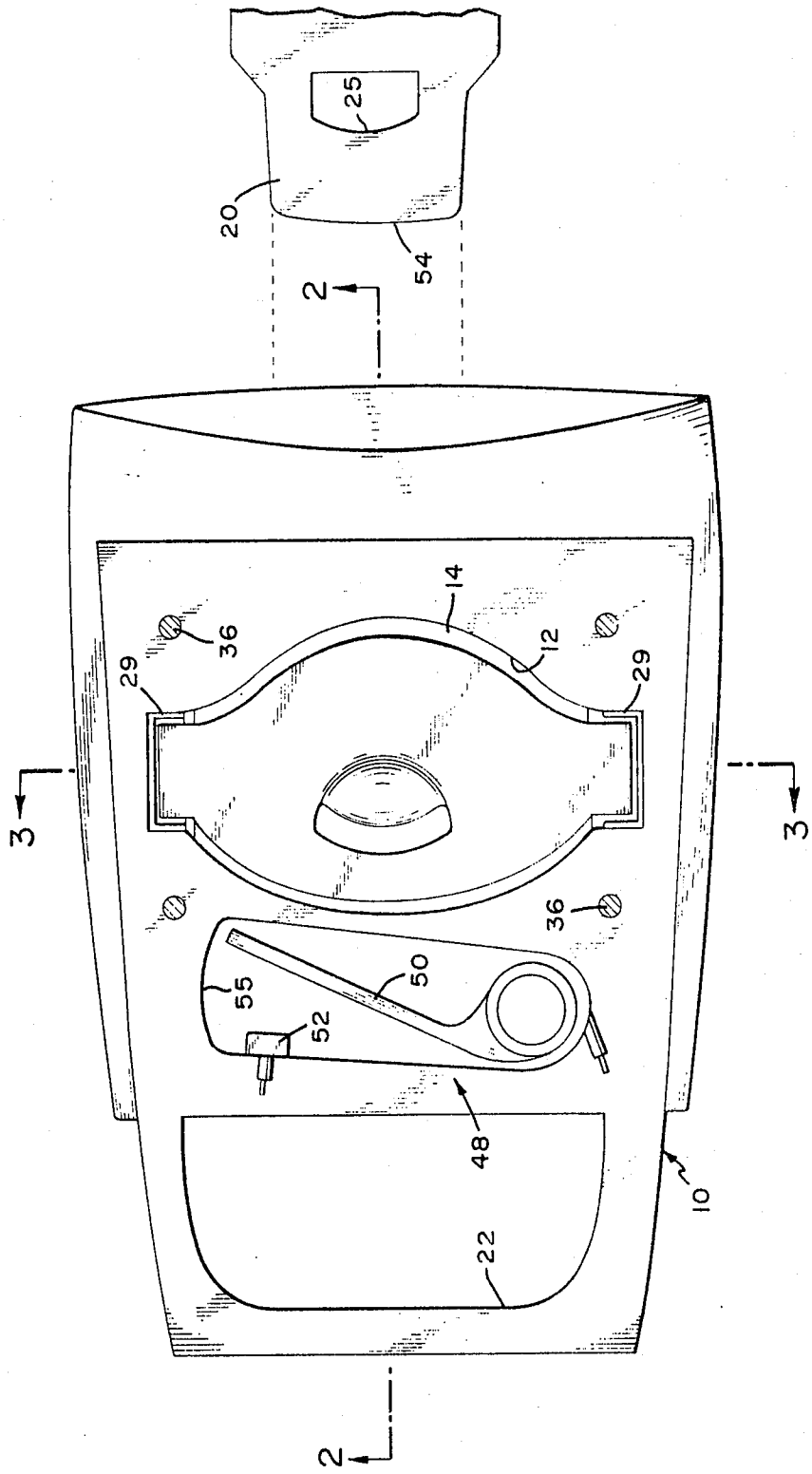


FIG. 2

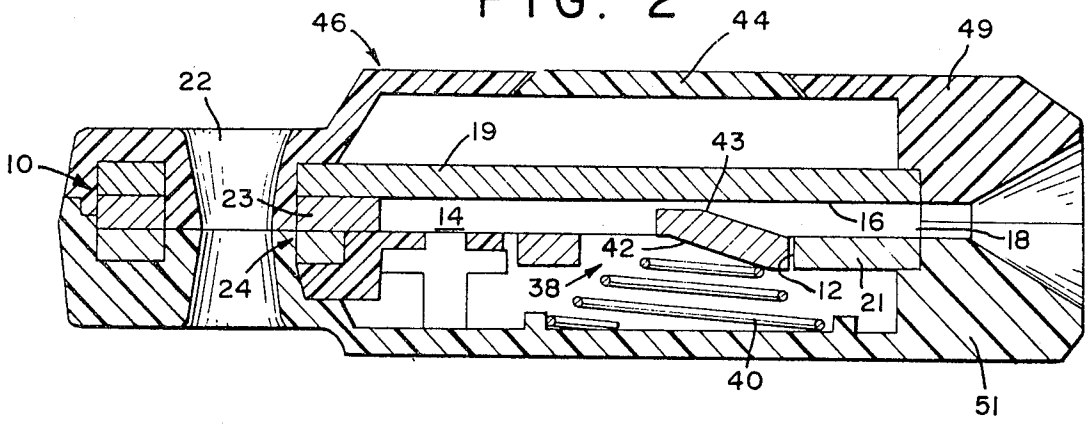


FIG. 3

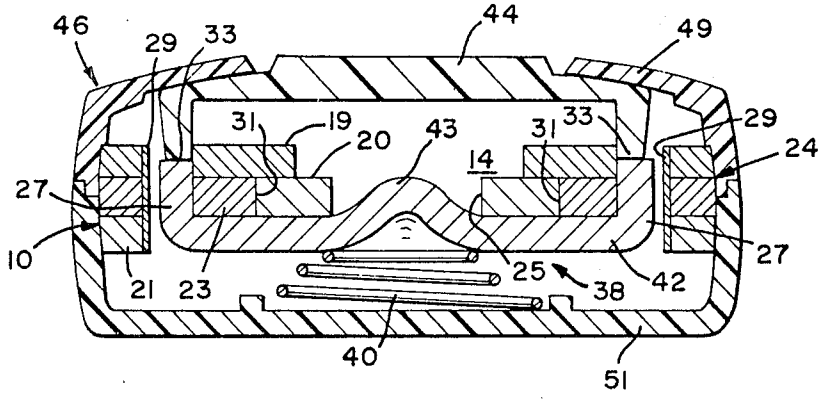


FIG. 4

