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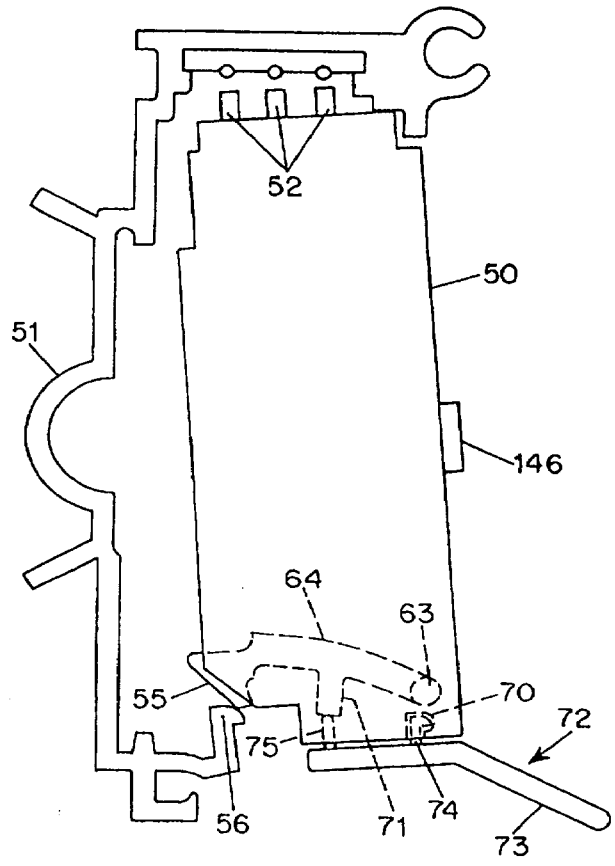
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(54) Title: PROMOTIONAL LIGHT

(57) Abstract

A compact, self-contained promotional flasher (50) for use in a retail environment has a unobstrusive form factor, thus minimizing the risk of physical damage when placed for use. The flasher (50) may draw power from long rails (51) of nearly constant cross section, or alternatively may contain rechargeable batteries (151). The flasher (50) may have a directional lens optimizing the distribution of the emitted light, and the light source is preferably a high-intensity light-emitting diode (146).



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PROMOTIONAL LIGHT**Technical Field**

The invention relates generally to promotional devices for retail applications.

Background Art

Much attention has been paid in recent years to the retail marketplace, and in particular to the grocery store marketplace. Retailers have a specific set of needs for new merchandising solutions. It is desired to have a means for
5 lifting sales on promoted items, and the means needs to be more effective than previously employed means. The solution should require only low maintenance and support costs, and must be maintainable by average store clerical personnel. It is desirable that the solution be attractive in both
10 appearance and performance to manufacturers in order to attract support therefrom. Finally, the solution should mount to the shelf edge in a physically secure fashion to minimize vandalism or theft.

Manufacturers already pay retailers for special promotional
15 programs such as in-store displays, special promotional labels, and advertising. They also pay third parties for in-store promotions such as in-store coupons at point-of-sale (POS) and point-of-purchase (POP), in-store radio and
20 televised commercial spots, signage on shopping carts, and the like. The third-party solution providers in these cases typically keep a large majority of the manufacturer funding as a fee for the services rendered. Retailers need a promotion which is effective on a par with previously employed devices,

but which does not require a third party; as a result the retailer gets to keep all of the manufacturer's funding.

5 Examples of proposed solutions that have many of these drawbacks may be seen in US Pat. Nos. 5,083,765 to Kringel, 5,207,349 to Kringel, and 5,249,705 to Gates. These systems offer a battery-powered motorized coupon dispenser with some blinking LEDs. The apparatus described there are very bulky and thus are at risk of damage from passing shopping carts or energetic children. These apparatus contain bulky batteries and require manual steps to replace the batteries. Each 10 manual battery replacement step leads to wear and tear on the apparatus. These apparatus are composed of myriad moving parts which have to be assembled in the first place and which may fail later. The batteries typically have to be replaced 15 monthly.

Still other past approaches include the following. One shelf label system used in warehouse picking applications includes large LEDs used to direct personnel to their next task. This is not useful in a retail setting. Another system combines a 20 battery-powered perpendicular mount LED arrangement like that set forth in the above-referenced U.S. Pat. Nos. 5,083,765 and 5,207,349 to attract the attention of customer. The system provides an audio promotional message when prompted with a button push. Yet other systems have employed flashing LEDs 25 and continuous LEDs for short-term promotions, for example where LEDs mark the eyes of an animal for a product associated with that animal. Still another system has placed LEDs behind a bicycle-type reflector, powered by a battery pack attached with magnets under the shelf. Finally, numerous systems use 30 banks of LEDs which are programmed to show promotional messages. Such a system requires standard AC power and is far too large to be placed at a standard shelf edge. Yet another

approach, typified by the system of U.S. Pat. No. 5,374,815, used electronic price displays containing small LEDs (Fig. 2, reference designation 6) intended for use in promotional and other applications. This approach has not proven to be cost effective.

Disclosure of Invention

In accordance with the invention, what is provided is a compact, self-contained promotional flasher for use in a retail environment. The flasher has an unobtrusive form factor, thus minimizing the risk of physical damage when placed for use. The flasher may draw power from long rails of nearly constant cross section, or alternatively may contain rechargeable batteries. The flasher may have a directional lens optimizing the distribution of the emitted light, and the light source is preferably a high-intensity light-emitting diode.

Brief Description of Drawings

The invention will be described with respect to a drawing in several figures, of which:

Fig. 1 is a cross section of a shelf rail system and a device capable of being mechanically engaged therewith;

Figs. 2 and 3 show cross sections like that of Fig. 1 and illustrate the process of insertion of the device into the rail;

Figs. 4 and 5 detail in cross section the manner in which latches in the device engage with the rail;

Fig. 6 details features of the rail extrusion of Figs. 1 through 5;

Figs. 7a, 7b, and 7c are side, top, and prespective views, respectively, of a removal tool for removing the device of Fig. 1;

Fig. 8 shows the removal tool in operative engagement with the device of Fig. 1;

Figs. 9 and 10 show the sequence of events as the removal tool of Fig. 7a is employed to remove the device of Fig. 1;

Fig. 11 shows the promotional flasher according to the invention;

Figs. 12 and 13 are side and perspective views, respectively, of the flasher of Fig. 11;

Fig. 14 is a schematic diagram for a rechargeable embodiment of the flasher of Fig. 11;

Fig. 15 is an alternative embodiment of the schematic diagram of Fig. 14;

Fig. 16 shows in cross section a rechargeable flasher in engagement with the shelf edge price rail;

Fig. 17 shows in cross section the rechargeable flasher of Fig. 16 snapped into a recharging rail;

Figs. 18 and 19 show in cross section and in plan view, respectively, the recharging rail of Fig. 17;

Fig. 20 is a schematic diagram of an externally powered embodiment of the flasher of Fig. 11;

Fig. 21 is a schematic diagram of a recharging apparatus used with the rechargeable flasher of Fig. 15; and

5 Figs. 22 and 23 are plan views and cross-sectional views, respectively, of light distribution patterns in embodiments of the invention.

Modes for Carrying Out Invention

Turning first to Fig. 11, what may be seen is a front view of the promotional flasher 50 according to the invention. Lamp 10 146, which is preferably a light-emitting diode (LED), flashes to attract the attention of a customer in a store. Figs. 12 is a side view of the flasher, revealing external springy contacts 52, feature 157 which engages the top of the rail, and latches 55 which engage the bottom of the rail. Fig. 13 15 shows the latches 55 in perspective view. Turning now to Fig. 20, what may be seen is a schematic diagram of the flasher. AC power is received at terminals or contacts 154. Diode 149 and an associated capacitor generate DC power for the 20 oscillator 147 which is made up of NAND gates in a ring oscillator as is well known in the prior art. The output of the oscillator drives the base of bipolar transistor 148, which selectively allows LED 146 to be electrically coupled with the AC power. Dropping resistor 153 provides current 25 limiting within the LED, to limit its current flow to the typical 20 mA providing maximum brightness.

It is noted that diode 149 rectifies power only for oscillator 147. LED 146 is able to emit light even when provided with AC power, since the LED itself serves as a diode. This permits

cutting back on the current capacity of diode 149 to permit space and cost savings. It is also noted that the flasher according to this embodiment draws current mostly from one of two half-cycles of the AC power. In a system having
5 electronic price displays that also draw power from one of two half-cycles, this feature of the flasher is advantageous since it can be set up to draw power from a half-cycle other than the one used by the labels. In this way, the addition of flashers to an electronic price display system need not add to
10 the energy budget nearly to the extent that might be expected on first consideration of the system.

Returning now to Fig. 1, the flasher appears in cross section. Latches 55 appear in some detail. Each latch is spring-loaded downwards in Fig. 1 and can be lifted up by upwards pressure
15 on feature 71, as is described in considerable detail in copending appl. no. 08/036,950, which is incorporated herein by reference. Latches 55 engage with feature 56 of the rail 51. Feature 57 of the flasher engages with feature 58 of the rail 51, and the rail is detailed in Fig. 6. Figs. 2, 3, 4,
20 and 5 show in great detail in cross-section the sequence of events as a flasher 50 is inserted into the rail 51, as is discussed in the copending appl. no. 08/036,950. Figs 7a, 7b, and 7c show the removal tool which is used to remove the flasher 50 from the rail 51. As shown in cross section in
25 Fig. 8, tool 73 is engaged by protuberance 74 to a corresponding cavity in the bottom surface of the flasher 50. Rotation of the tool clockwise, as indicated by arrow 72 in Fig. 8, causes features 75 of the tool to apply upwards pressure on the aforementioned features 71. This lifts the
30 latches 55 and permits the label to rotate counterclockwise as shown in Figs. 9 and 10.

In an alternative embodiment of the invention the flasher 50

is not continuously powered externally but instead contains a rechargeable battery 151 (Fig. 14). A diode 50 is preferably provided to block reverse current flow that might arise in the event that recharging contacts 52 happen to become shorted.

5 In the absence of diode 50, there is the danger of shorting as the flasher 50 is placed into a rail (as in Fig. 16) or as the flasher 50 is being transported by store personnel from a charging rack (Fig. 17) to a shelf location in the store. Such a short could, at a minimum, partially or completely
10 discharge the battery, and could even result in overheating or welding of metal at the contacts 52.

The embodiment of Fig. 14 is "trickle-charged" by means of a simple power supply that is at a slightly higher potential than the nominal voltage of the battery 151 (taking into
15 account the typical 0.6 V drop across diode 150 if provided). This simple embodiment minimizes the cost of the flashers and minimizes the number of external contacts, and simplifies the charging system.

Turning now to Fig. 16, what is shown in cross section is a
20 rechargeable flasher 145 in engagement with the shelf edge price rail 159. The shelf edge price rail 159 is "C" shaped. Contacts 154 may or may not come into contact with the rail 159, but the aforementioned diode 150 blocks current leakage. Fig. 17 shows in cross section the rechargeable flasher of
25 Fig. 16 snapped into a recharging rail 158. The recharging rail 158 has contacts 141, 142 which provide charging voltage from a power supply, not shown in Fig. 17 for clarity. The charging rail 158 has conductors 141, 142 as shown in Fig. 18. Upper and lower lips 143, 144 are similar to those of the
30 shelf rail 159. In the preferred embodiment the rail 158 is of constant cross section (or nearly constant cross section). Fig. 19 shows in plan view the recharging rail of Fig. 17.

The flasher 145 has mounting means at its rear face that engage with rail 159 and that are tamper-proof: the flasher cannot be removed without a special tool analogous to that of Figs. 7a, 7b and 7c.

5 Fig. 15 is an alternative embodiment of the schematic diagram of Fig. 14. A thermistor 152 is provided which monitors the temperature of the battery 151. As is well known to those skilled in the art, the charging system can monitor the temperature of the battery during a "quick charge" which uses
10 a higher charging voltage than in a "trickle charge" system. A sudden rise in the battery temperature signals that the battery has reached full charge, and the charging voltage is cut off.

In either of the rechargeable embodiments it is noted that
15 there is no need of an on-off switch for the lamp 146. Thus the flashers are flashing when they are in the store on the shelves, and are also flashing when they are on the charging rail.

Fig. 21 is a schematic diagram of a recharging apparatus used
20 with the rechargeable flasher of Fig. 15. Charging control 210 receives the temperature information from the thermistor 152 and cuts off power from the power supply 211 when the associated flasher is fully charged. A small trickle of power is preferably maintained so that the continued flashing of the
25 lamp 146 (Fig. 14) does not discharge the battery 151.

Figs. 22 and 23 are plan views and cross-sectional views, respectively, of light distribution patterns in embodiments of the invention. Fig. 22 is an overhead view of a store aisle defined by gondolas 213. In an exemplary embodiment the

emission pattern of the LED at flasher 50a (Fig. 22) is more or less hemispherical as indicated by 214. However, depending on the particular application it may be desirable to select an LED with a lobed emission 215 as at 50b. Alternatively, a lens may be placed to receive the light from the LED and to focus it in particular directions such as along the aisle as indicated at 215. Fig. 23 shows an end view of an aisle, again defined by gondolas 213. Flasher 50c, which is located near the floor, may optionally emit its light substantially upwards. Again this may arise due to the selection and orientation of the LED or may be the result of a lens redirecting the light therefrom.

While the flasher is shown with separate oscillator 147 and LED 146, those skilled in the art will appreciate that commercially available flashing LEDs are known. If such an LED is employed, it may be said that what is used is an LED with an integrated oscillator and driver transistor.

An exemplary flasher is desirably between about one and two inches tall, and comports pleasingly with electronic price displays if used. It is desirably between 3/8 inch and one inch thick. While the LED is shown as protruding in Fig. 13, it may be of a lower profile as shown in Fig. 1. The width is desirably between 1/2 inch and one inch in the externally powered embodiment, or may be as wide as 2.5 inches to accommodate commercially available rechargeable batteries such as AA batteries.

Those skilled in the art will appreciate that one embodiment that has been disclosed is a promotional flasher system that is powered by a rail. This rail can be the same rail that used for an electronic price display system, for example the rail set forth in US appl. no. 08/036,950, filed March 25,

1993, which is incorporated herein by reference. In this embodiment, the flashers draw power from the rail and thus no batteries are required. This saves the ongoing expense that would otherwise be required with monthly or more frequent battery replacement, such as is required with systems such as those mentioned above, e.g. U.S. Pat. Nos. 5,083,765, 5,207,349, and 5,249,705. This avoids the need of any AC power requirements beyond those of the rail system which is already in place, for example for electronic price displays. The electronic price display system can be that shown in U.S. Pat. No. 5,172,314, 5,241,467, 5,245,534, 5,348,485, 5,374,815, 5,448,226, 5,461,561, 5,467, 474, or 5,473,832, all owned by the present applicant and incorporated herein by reference.

The light-emitting diode can be a Chicago Miniature CMD72101UR/E. Such an LED has a viewing angle of 60°, a peak wavelength in the red portion of the spectrum at about 660 nm, and draws 20 mA at about 1.85 V. The luminous intensity is about 450 mcd. Alternatively it can be a Gilway E303 LED, again drawing about 20 mA at about 1.85 V, and a luminous intensity of about 200 to 300 mcd. Still another choice is a Hewlett Packard HLMP-Q106 LED with 500 mcd in a viewing angle of about 30° from about 20 MA at about 1.9 V.

Those skilled in the art will also appreciate that this embodiment is physically small. Without batteries, the unit is non-obtrusive into the consumer's space. This lowers dramatically the problems associated with impact from people, shopping carts, and other store equipment. It will be appreciated that those skilled in the art will have no difficulty devising obvious variations all of which should be considered within the scope of the claims which follow, rather than construing the invention as limited to the particular

configurations set forth above. For example, while the lamp is described as a light-emitting diode, other technologies could be employed such as incandescent lamps, electroluminescent panels, etc. In the embodiment that receives external power the distribution need not be AC but could be DC, for example.

Example I. A controlled study was conducted in actual retail stores. Five stores were used in the study. An item of merchandise was promoted by any of several means: a paper shelf label, an electronic price (shelf) label, an electronic price label with a promotional collar, an electronic price label with the promotional flasher according to the invention, and a three-way combination of an electronic price label, a promotional collar, and the promotional flasher. The term "lift" is defined as the increased sales attributable to the promotion. The lift with the paper shelf label alone was under 5%; with an electronic price (shelf) label was 15%, with an electronic price label with a promotional collar the lift was slightly over 15%, with an electronic price label with the promotional flasher according to the invention the lift was over 25%, and with a three-way combination of an electronic price label, a promotional collar, and the promotional flasher the lift was about 40%. In the case where a promoted item also had a price reduction, the lift was much higher.

Claims

What is claimed is:

1. A promotional flasher for use with a rail of substantially constant cross section, said rail having conductors
5 distributing power along the rail, said flasher comprising:

a housing;

engagement means associated with the housing and engaging said rail and said housing in mechanical conjunction;

10 contacts associated with the housing and electrically coupled with the conductors;

an oscillator within the housing and connected with the contacts; and

a lamp connected with the oscillator, whereby the lamp flashes.

15 2. The flasher of claim 1 wherein the housing is no larger than 1.6 inches by 3/4 inch by 3/4 inch.

3. The flasher of claim 1 wherein the lamp comprises a light-emitting diode.

20 4. The flasher of claim 1 further comprising a lens optically coupled with the lamp, said lens directing the light substantially in a hemispherical distribution.

5. A promotional flasher system comprising:

a power supply;

a plurality of rails of substantially constant cross section and operatively coupled with the power supply, said each of said rails having conductors distributing power along the rail;

and a multiplicity of flashers operatively coupled with the rails, each said flasher comprising:

a housing;

engagement means associated with the housing and engaging said rail and said housing in mechanical conjunction;

contacts associated with the housing and electrically coupled with the conductors;

an oscillator within the housing and connected with the contacts; and

a lamp connected with the oscillator, whereby the lamp flashes.

6. The system of claim 5 wherein the power supply is an AC power supply and each lamp is a light-emitting diode, each flasher further comprising rectifier means rectifying power supplied to the oscillator thereof.

7. A promotional flasher comprising:

a housing;

a mounting means associated with the housing adapted to attach

- to a grocery store shelving price rail;
- a rechargeable battery within the housing;
- at least two external contacts on the housing and operatively coupled with the battery;
- 5 an oscillator operatively coupled with the battery; and
- a lamp operatively coupled with the oscillator, whereby the lamp flashes.
8. The flasher of claim 7 wherein the lamp is a light-emitting diode.
- 10 9. The flasher of claim 7 wherein the oscillator and lamp are integrally packaged.
10. The flasher of claim 7 wherein the battery has two terminals, said flasher further comprising a rectifier in series between one of the contacts and one of the terminals.
- 15 11. A promotional flasher system, said system comprising:
- a power supply;
- a rail comprising at least two conductors disposed along the rail and operatively coupled with the power supply; and
- a plurality of promotional flashers, each flasher comprising:
- 20 a housing;
- a mounting means associated with the housing adapted to attach

- to a grocery store shelving price rail;
- a rechargeable battery within the housing;
- at least two external contacts on the housing and operatively coupled with the battery;
- 5 an oscillator operatively coupled with the battery; and
- a lamp operatively coupled with the oscillator, whereby the lamp flashes.
12. The system of claim 11 wherein each battery comprises a lithium ion battery.
- 10 13. The system of claim 11 wherein each battery comprises a nickel-cadmium battery.
14. The system of claim 11 wherein each battery comprises nickel-metal-hydride battery.

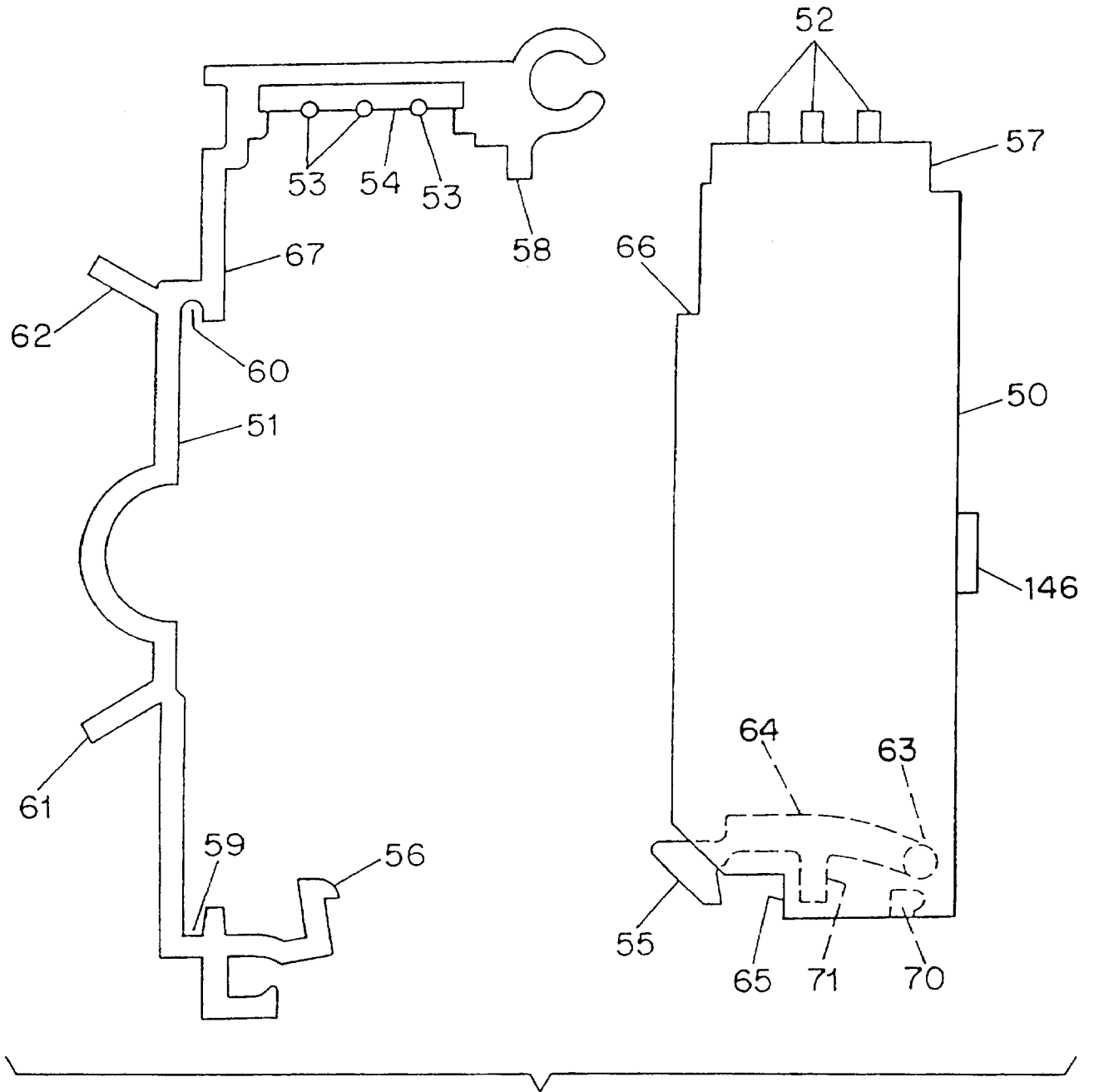


FIG. 1

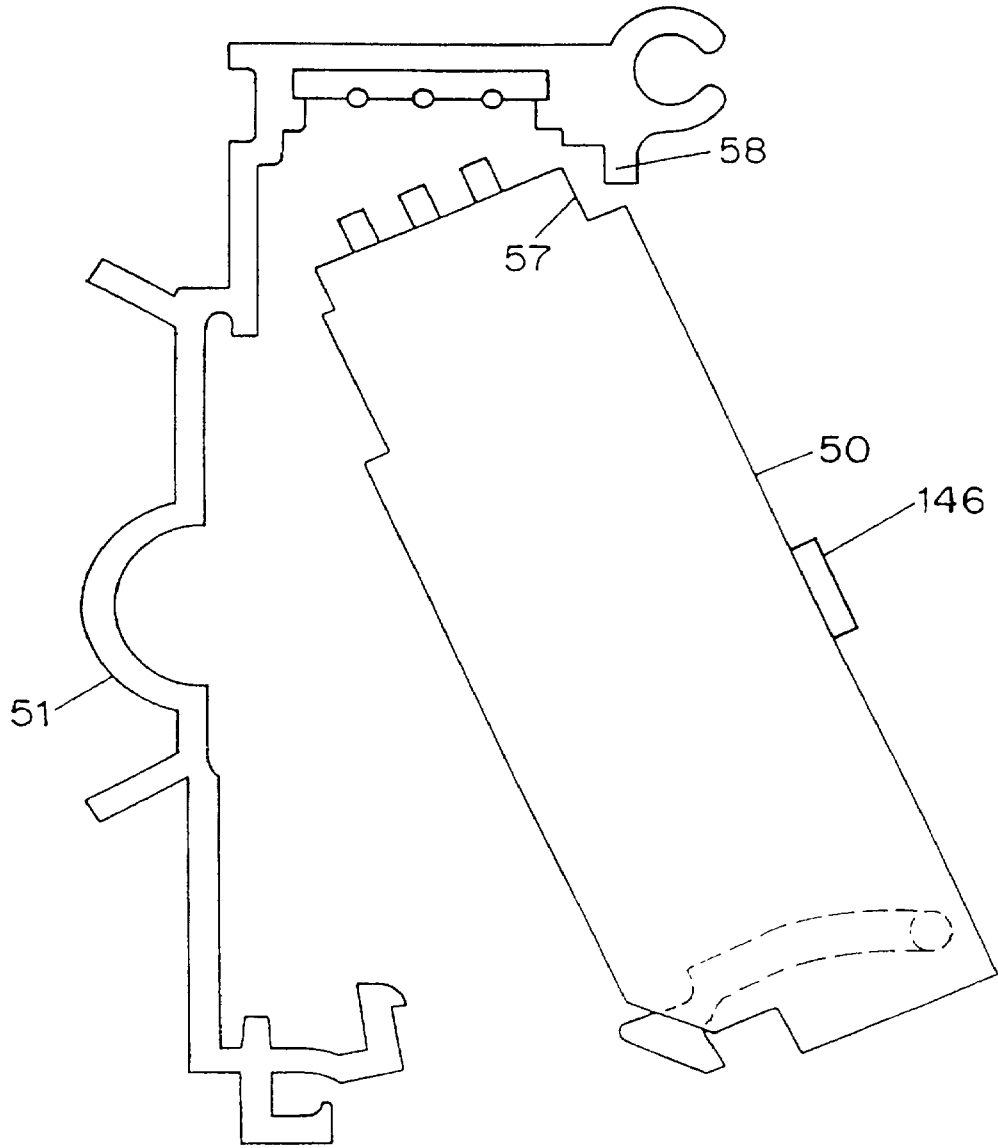


FIG. 2

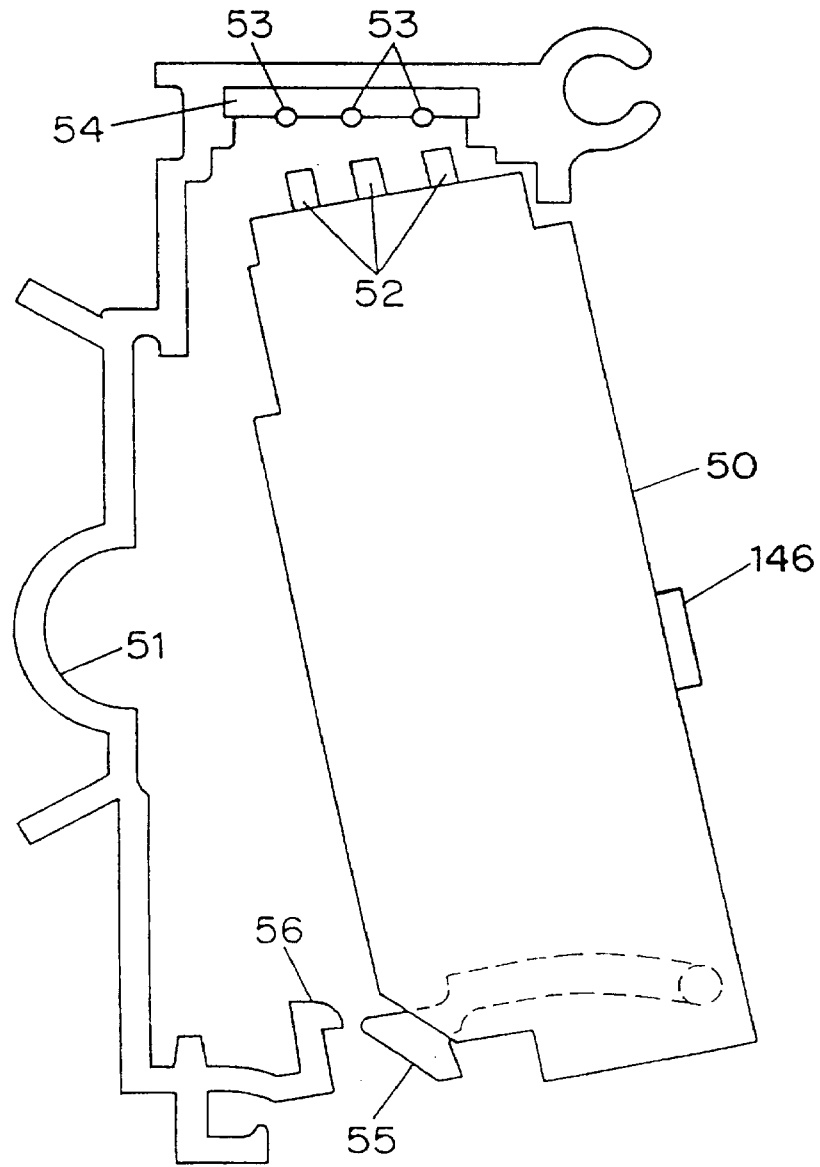


FIG. 3

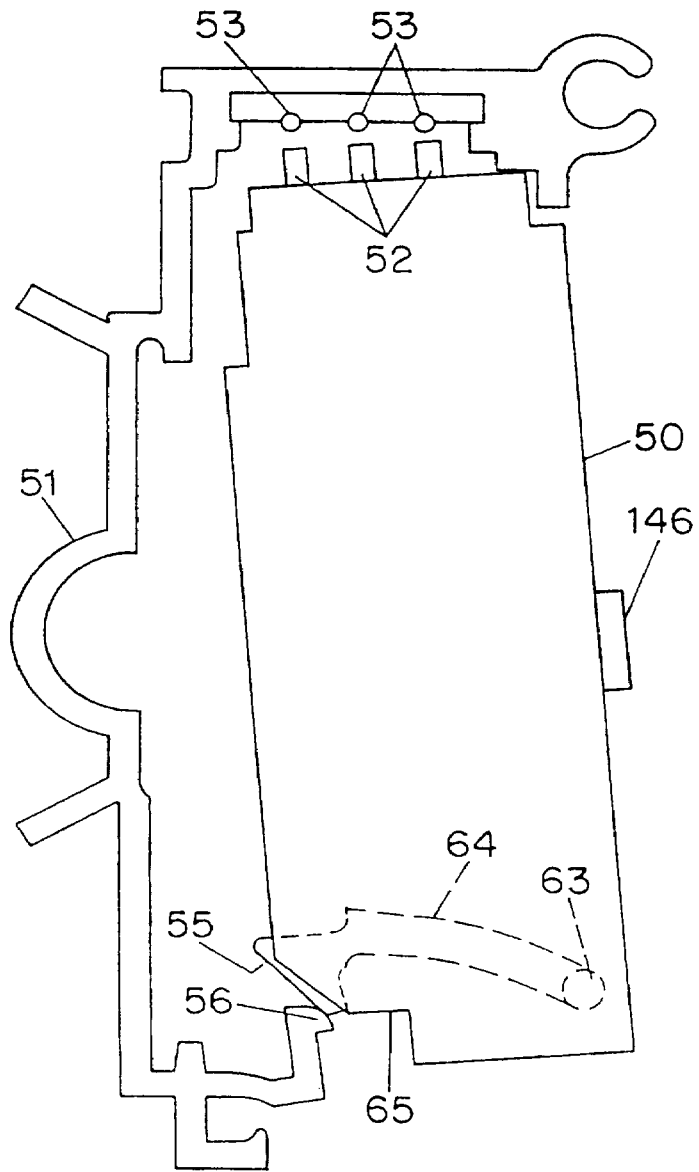


FIG. 4

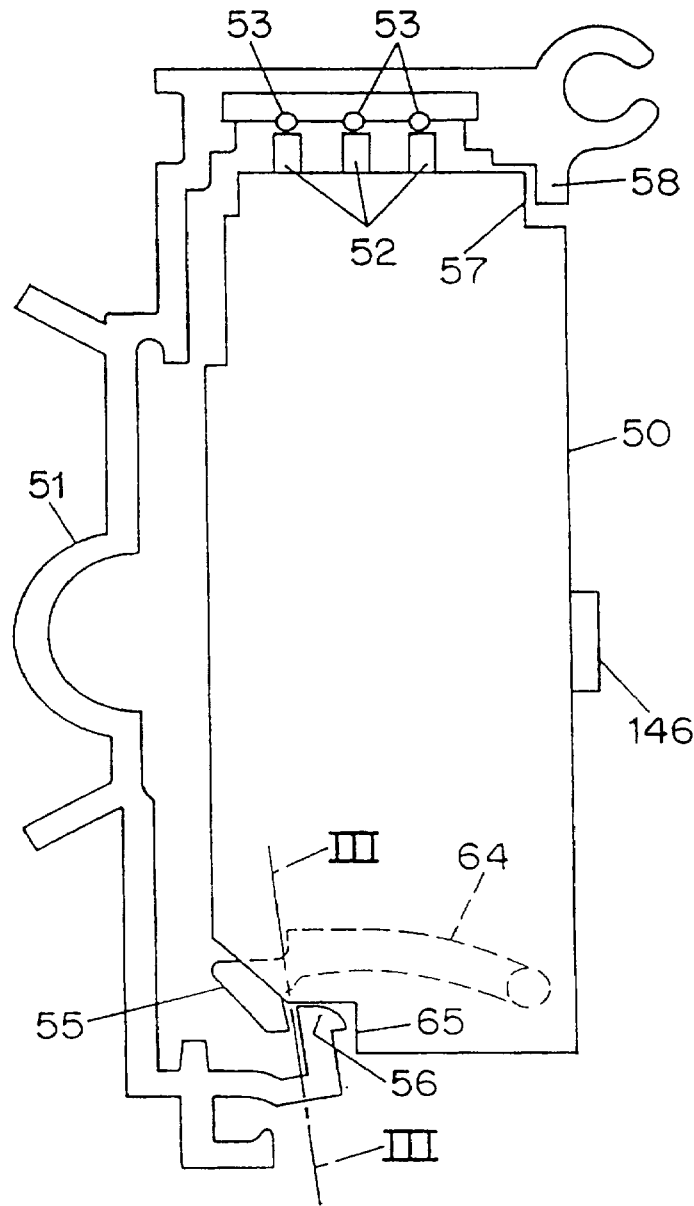


FIG. 5

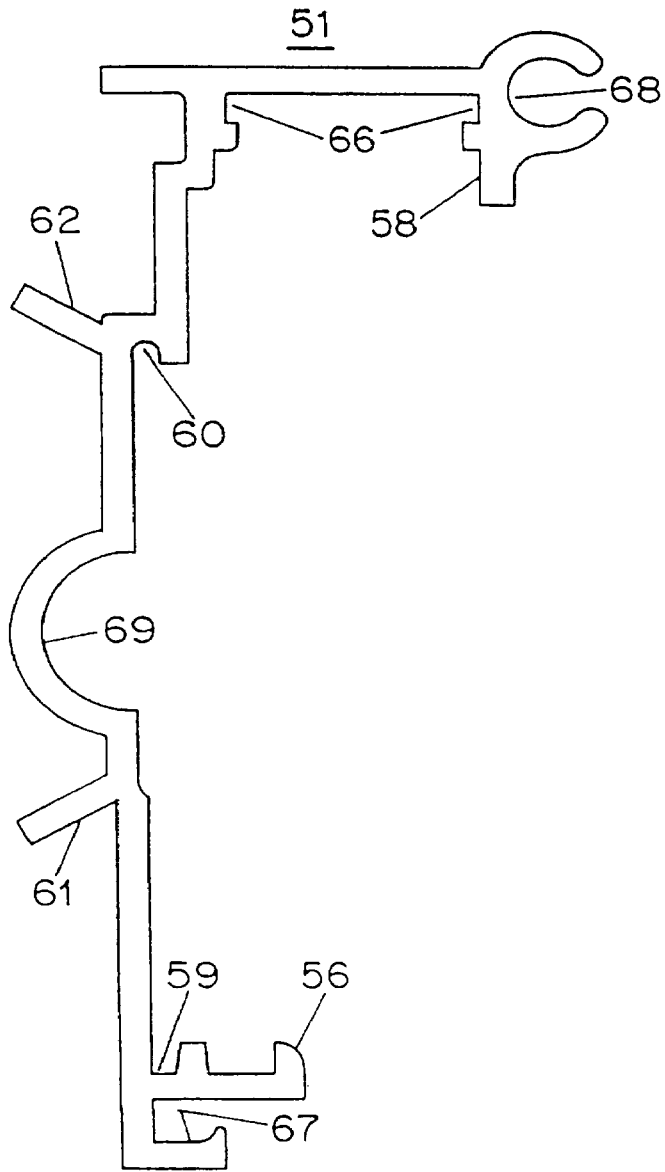


FIG. 6

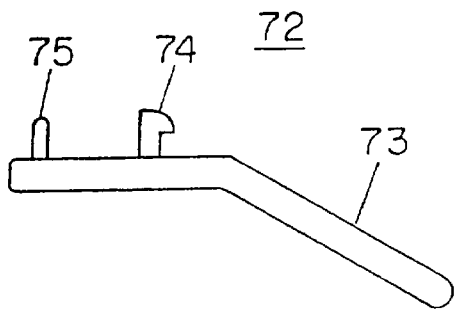


FIG. 7a

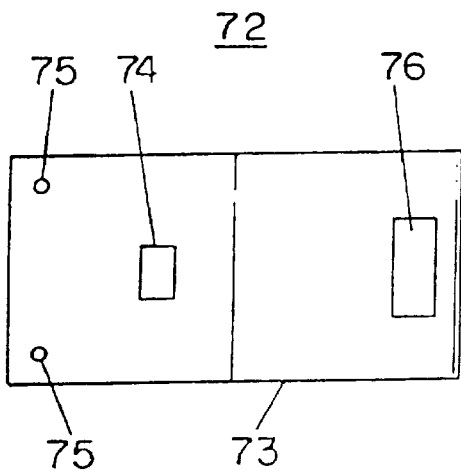


FIG. 7b

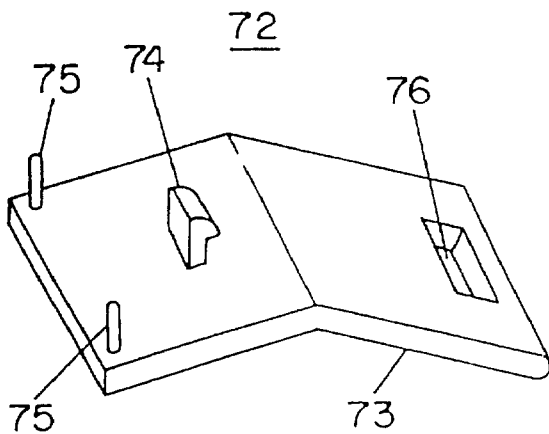


FIG. 7c

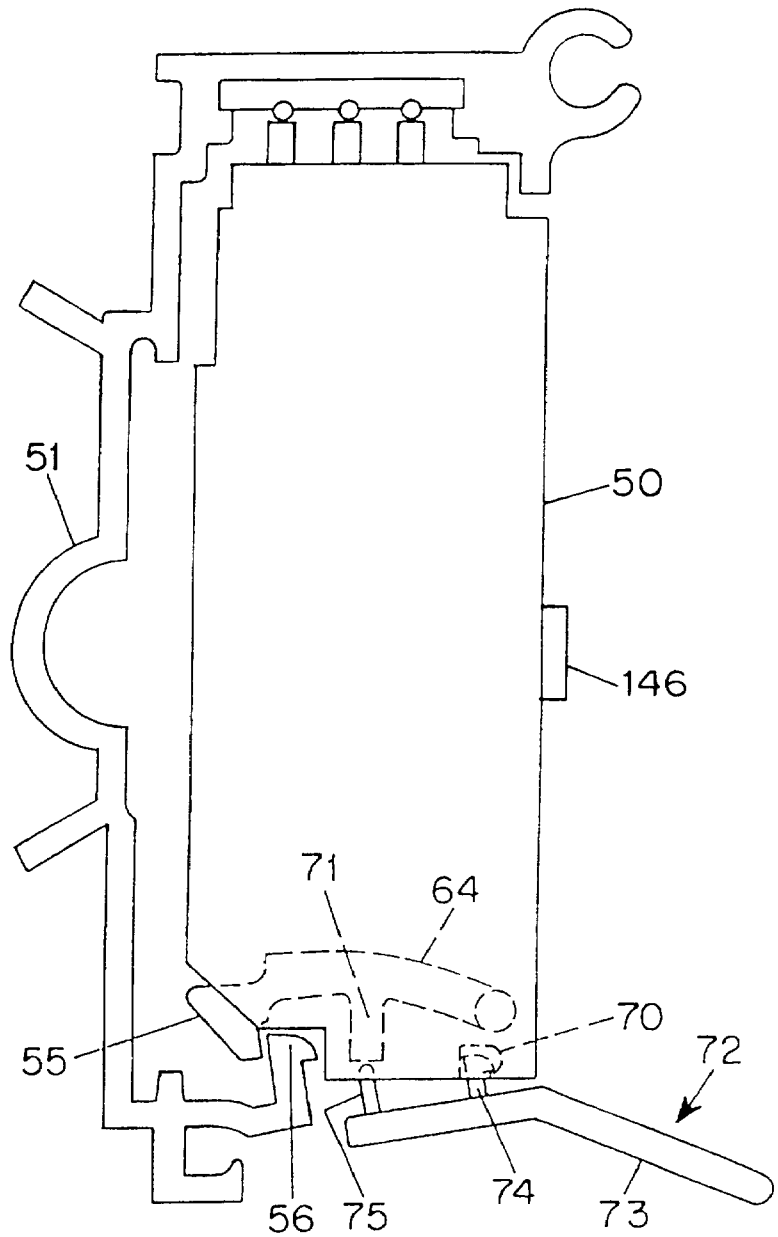


FIG. 8

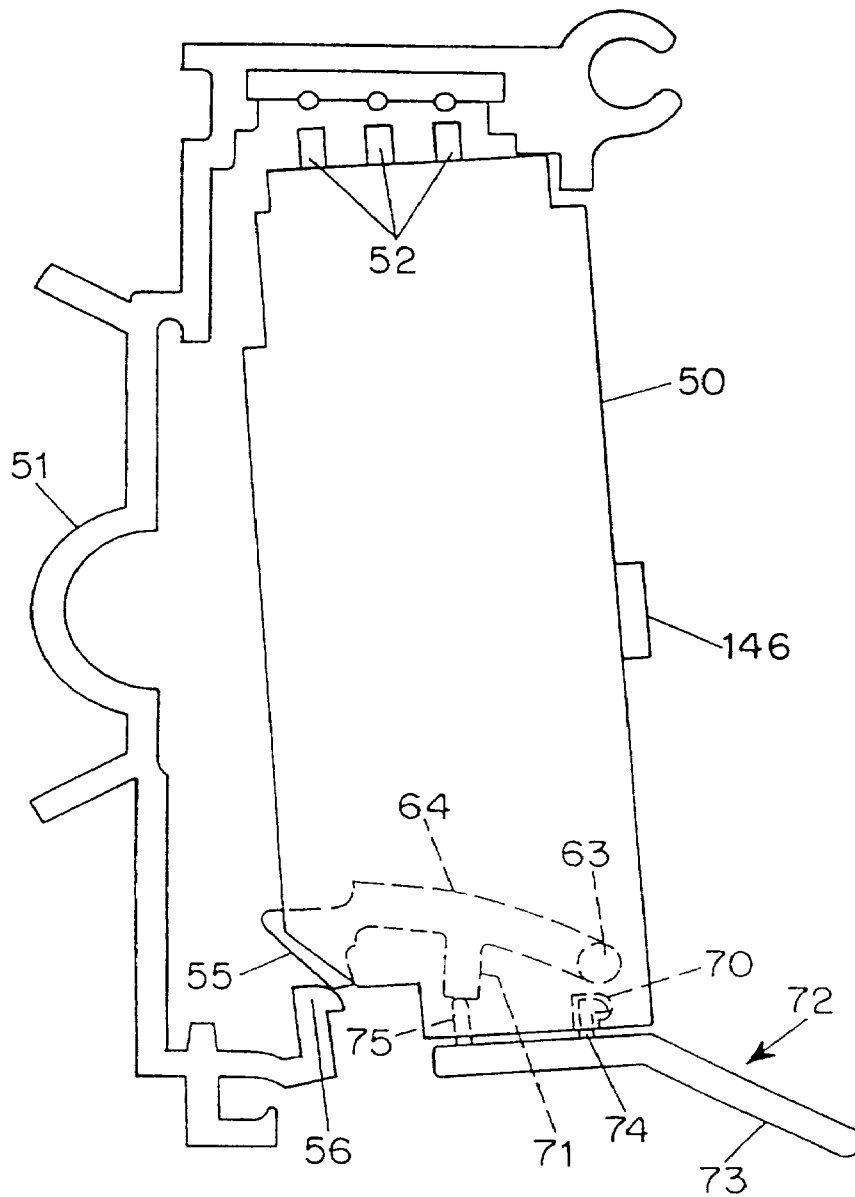


FIG. 9

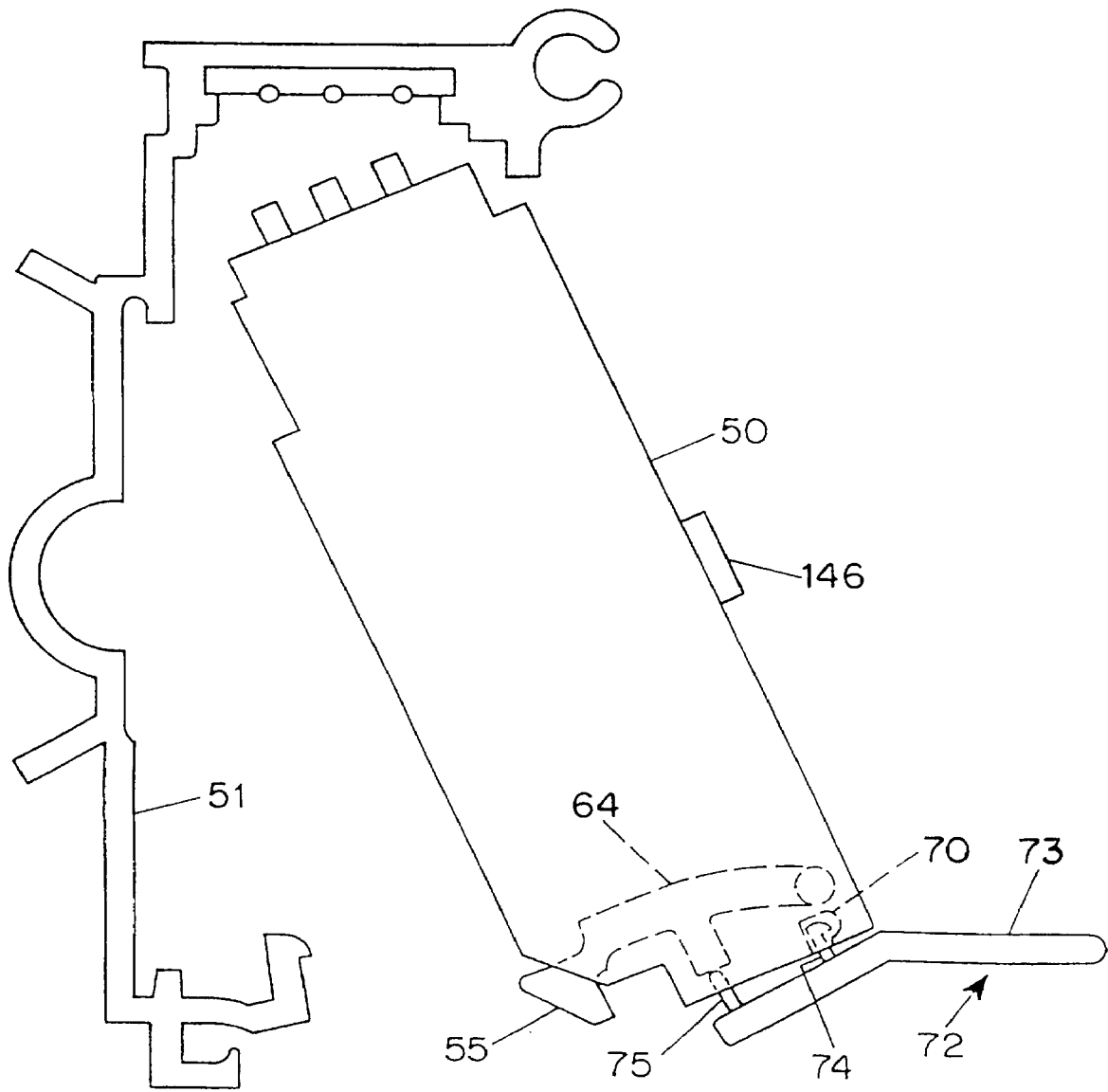


FIG. 10

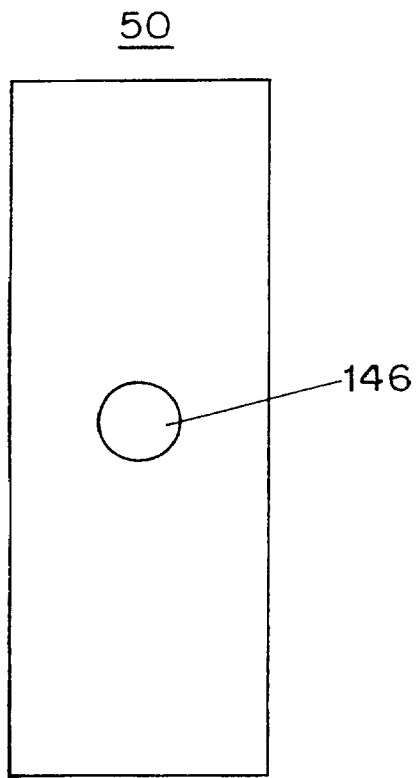


FIG. 11

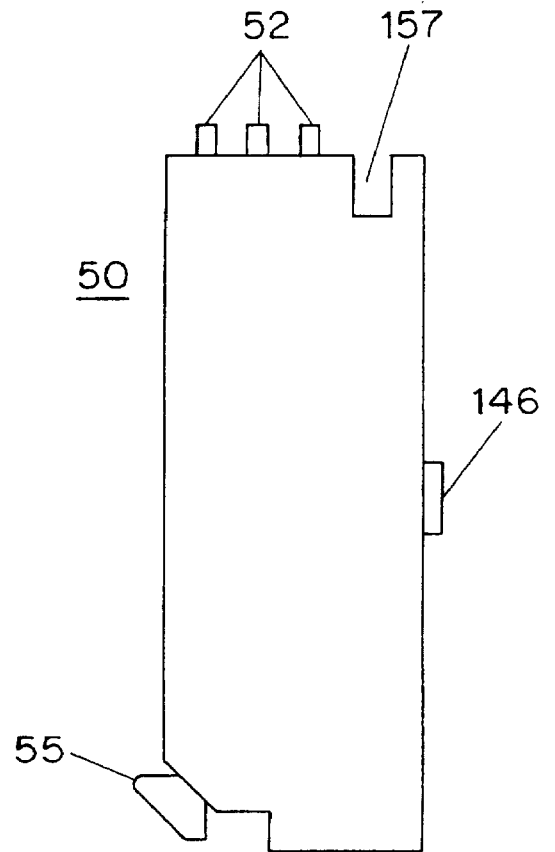
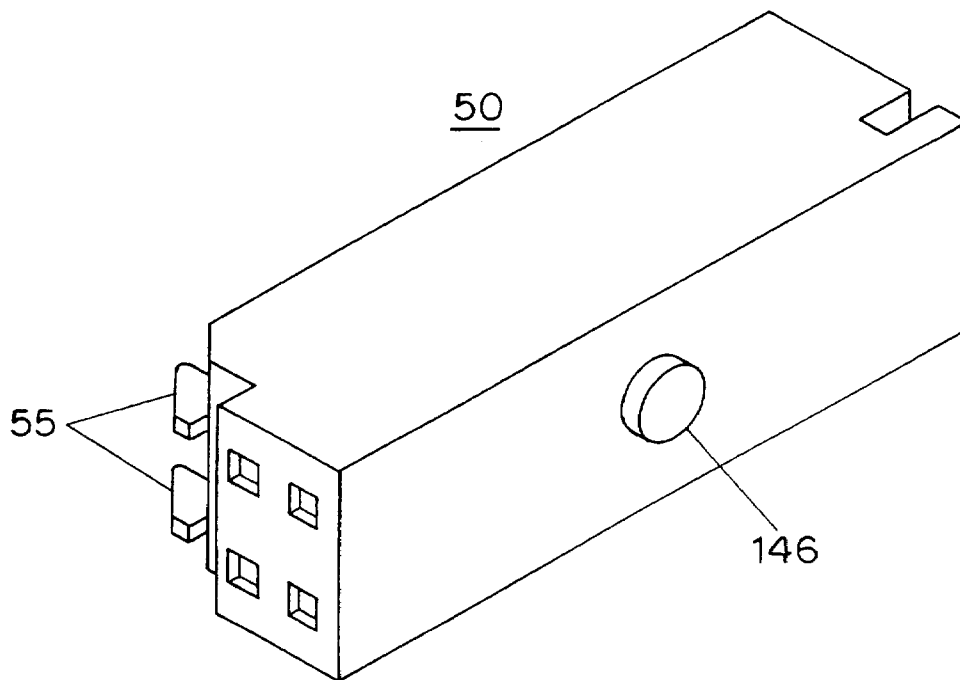


FIG. 12



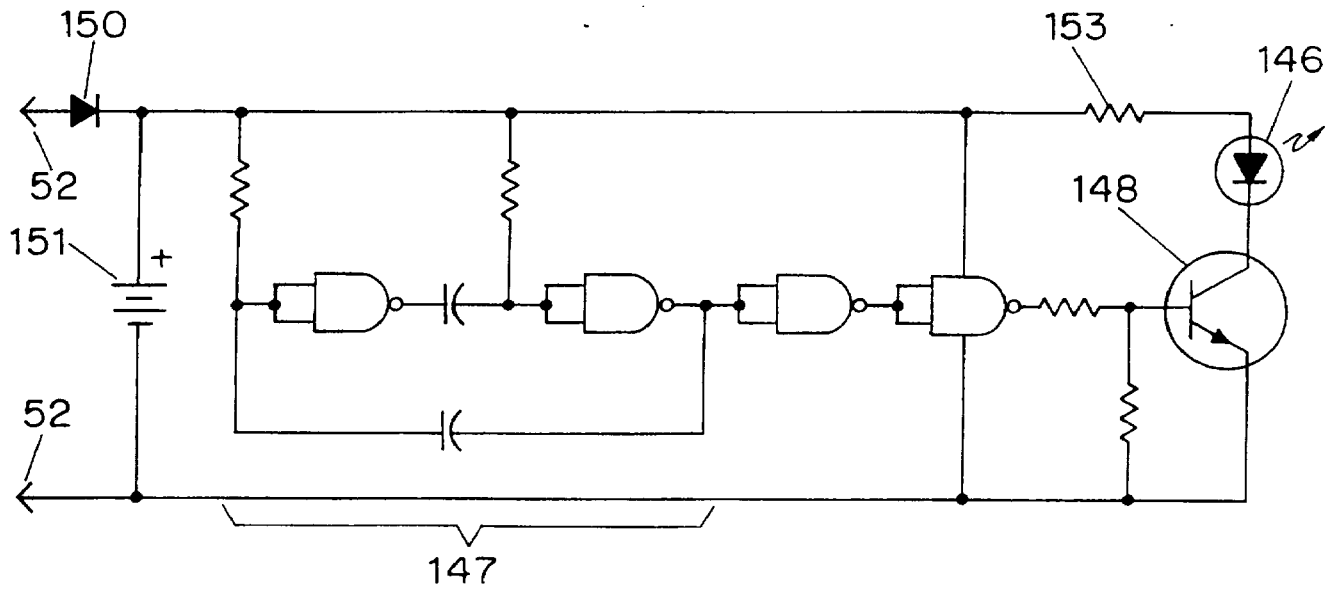


FIG. 14

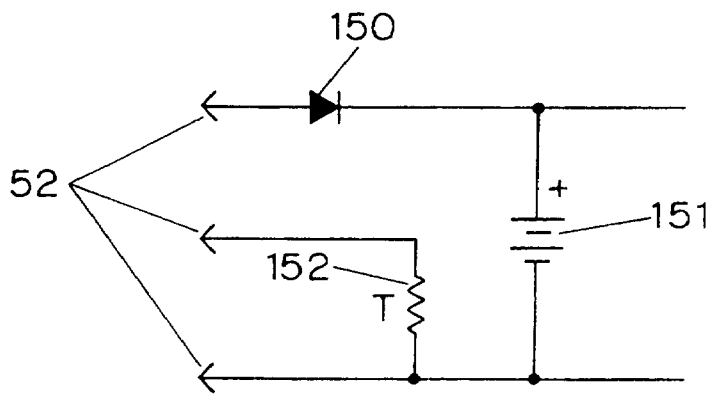


FIG. 15

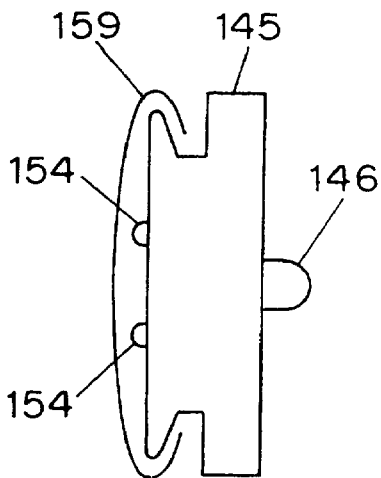


FIG. 16

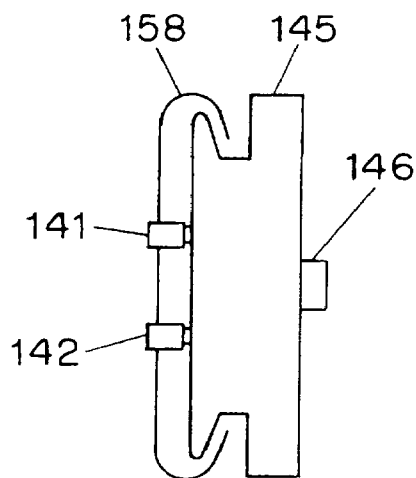


FIG. 17

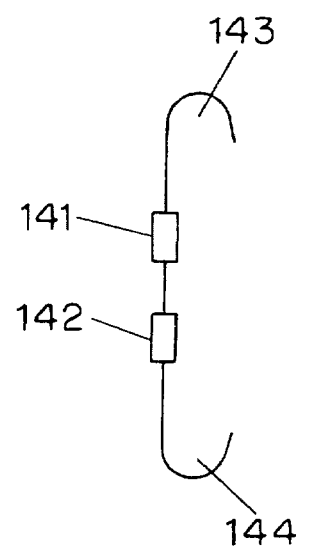


FIG. 18

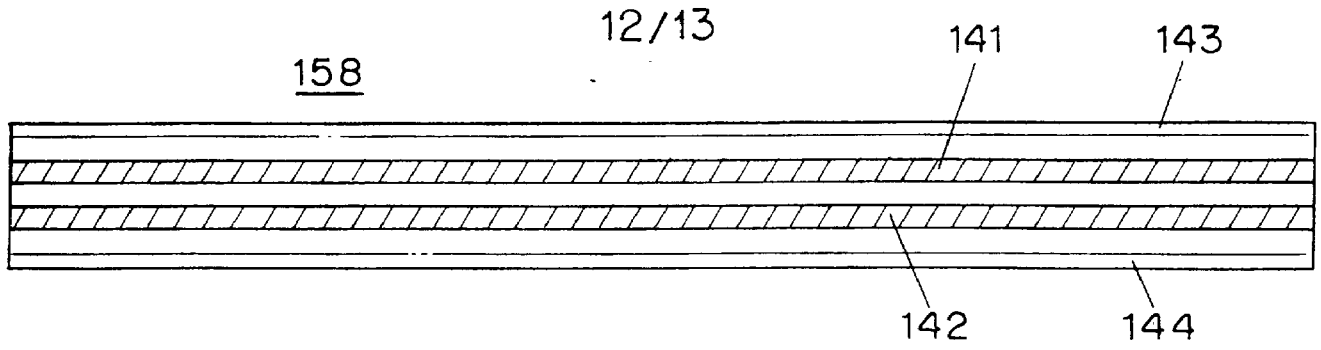


FIG. 19

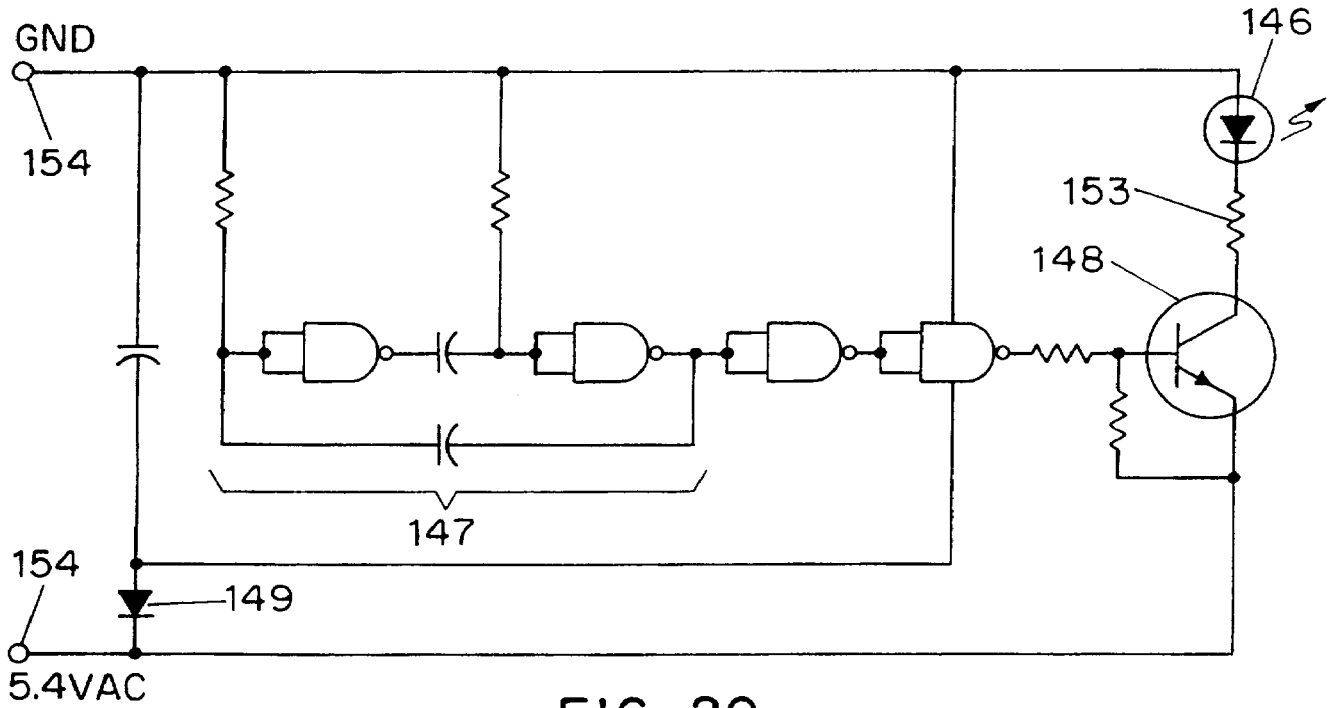


FIG. 20

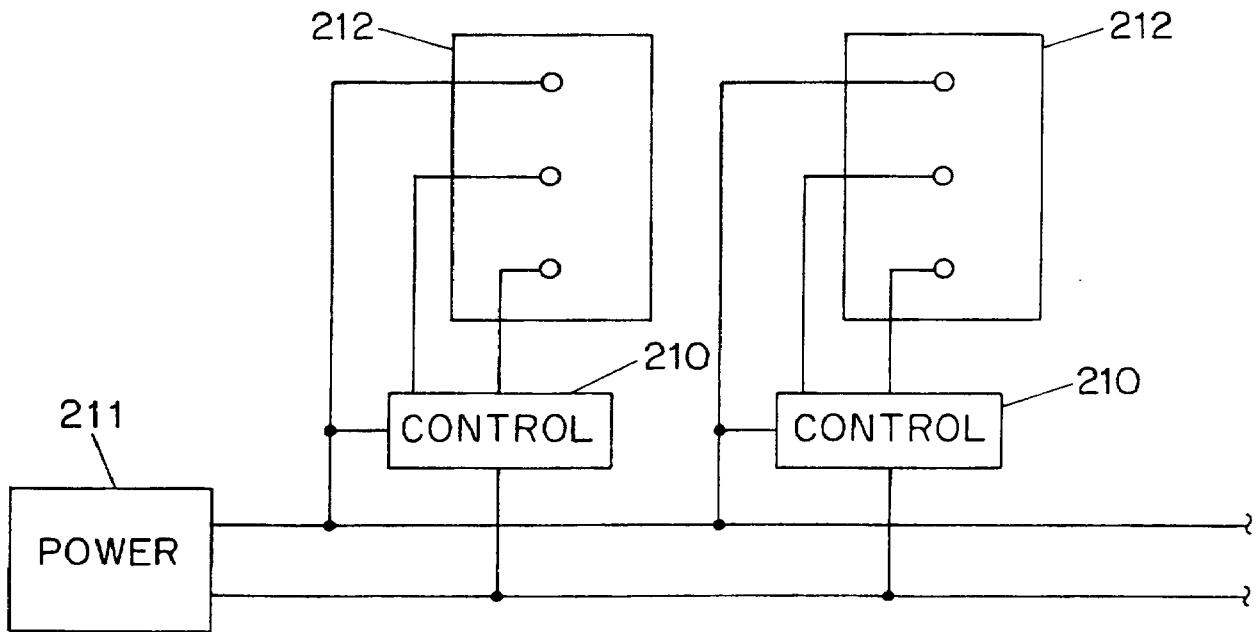


FIG. 21

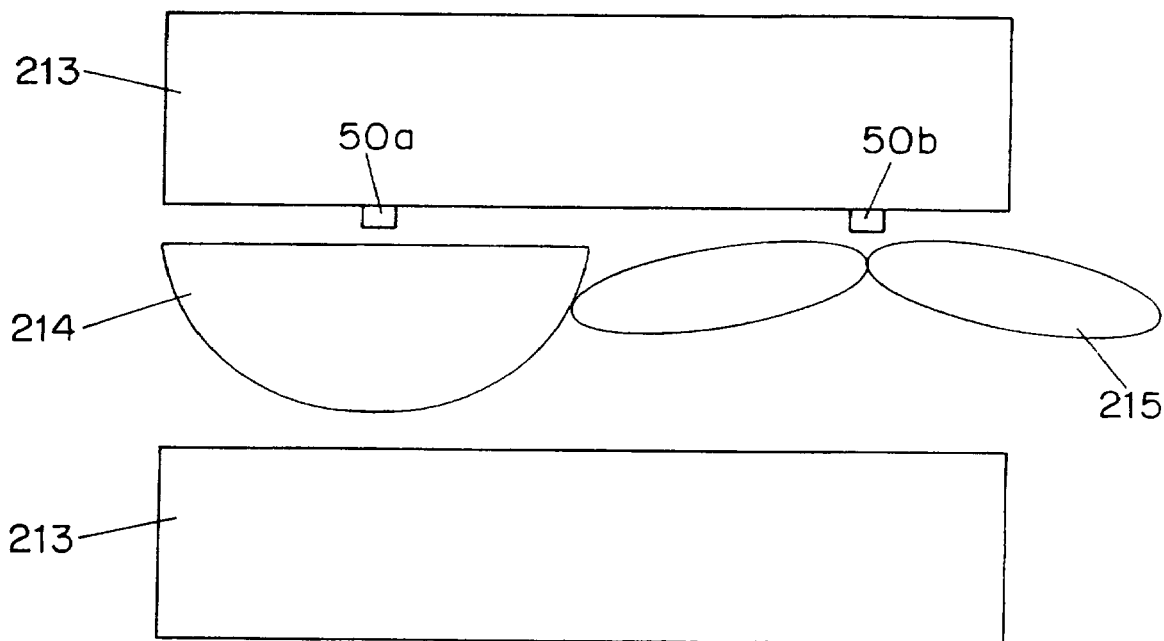


FIG. 22

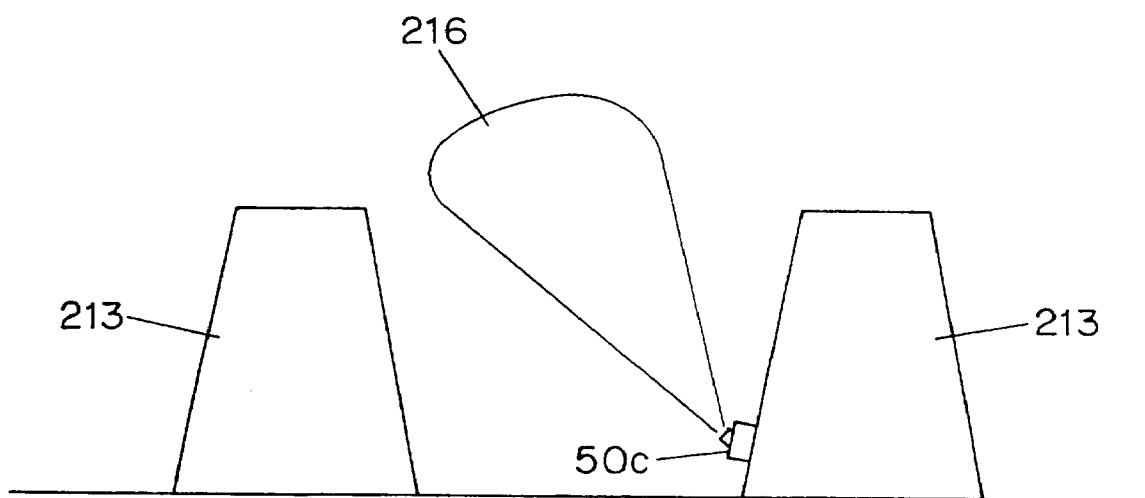


FIG. 23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/01865

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(6) :A47F 11/10; G09F 3/18
 US CL :362/125, 191, 183; 40/661.02, 661.03
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 362/125, 191, 183, 800, 217; 40/661.02, 661.03, 666

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,111,606 A (REYNOLDS) 12 May 1992, see entire document.	7-10
Y	US 4,924,363 A (KORNELSON) 08 May 1990, see entire document.	7-10
A	US 5,243,504 A (SEJZER) 07 September 1993, see entire document.	1-14

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 23 APRIL 1997	Date of mailing of the international search report 28 MAY 1997
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