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HIGH FREQUENCY DISPLAY DEVICE WITH MOVABLE GAS FILLED BALL MOVING THROUGH A TRANSPARENT TUBE

Filed March 29, 1965

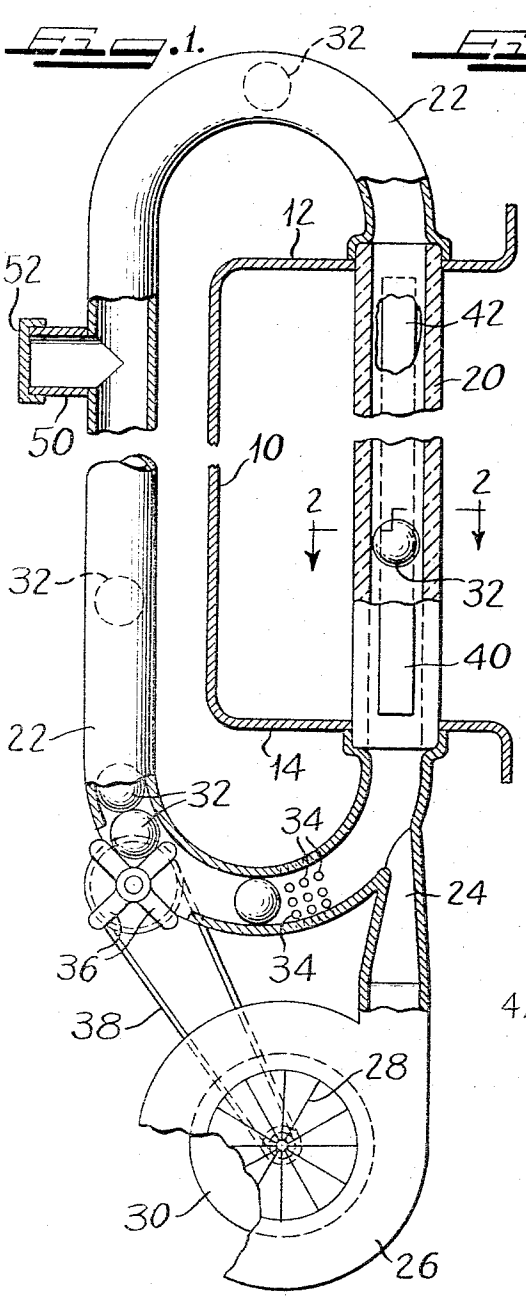


FIG. 1.

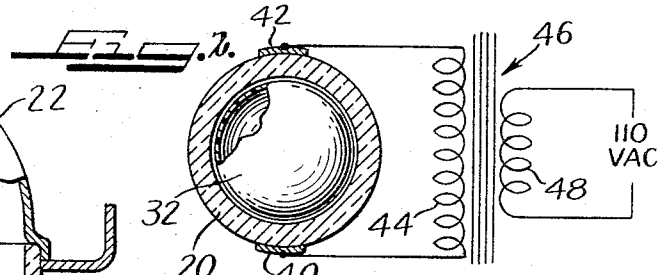


FIG. 2.

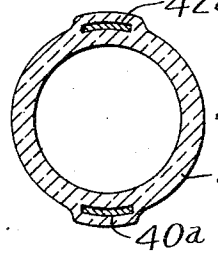


FIG. 3.

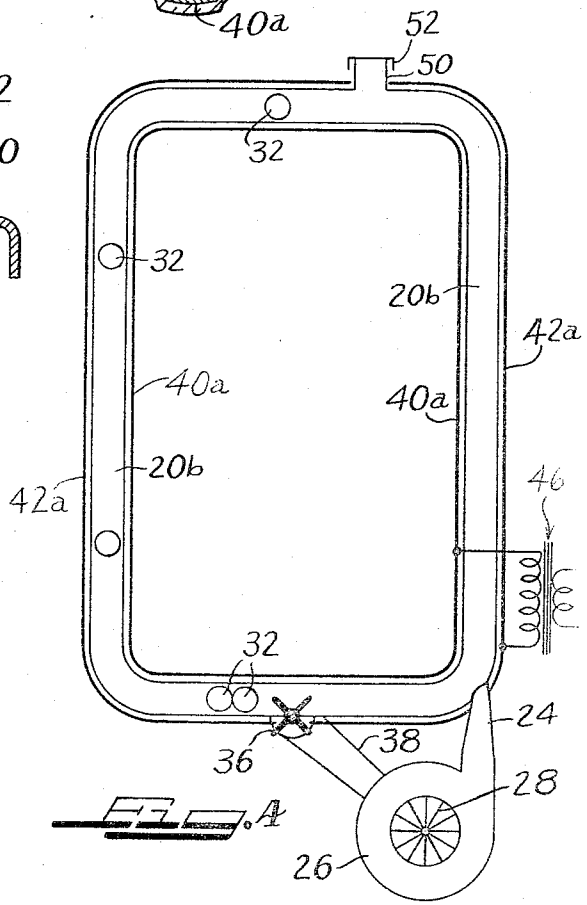


FIG. 4.

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HIGH FREQUENCY DISPLAY DEVICE WITH MOVABLE GAS FILLED BALL MOVING THROUGH A TRANSPARENT TUBE

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This invention relates to a display device of the type wherein illuminated elements such as balls or similar objects traverse a transparent tube to provide a novel activated type of display.

One object of the invention is to provide a display device wherein a transparent tube is provided and hollow bodies are transported along the tube, the hollow bodies being filled with suitable gases and an electrical field being provided along the tube so that the gases glow because of the electrical field through which they pass.

Another object is to provide a display device of the "neon light" type wherein illuminated balls (of different colors if desired) traverse a transparent tube thus providing an interesting motion type of display to be used in connection with signs, merchandise show windows and the like.

Still another object is to provide means for causing motion of the hollow bodies through the transparent tube by discharging air into the tube.

A further object is to provide means for returning the hollow bodies from the outlet end of the tube to the inlet end thereof, thus circulating them in a continuous manner.

Still a further object is to provide the transparent tube in the form of a closed loop through which the hollow bodies circulate, the entire length of the loop if desired being provided with an electrical field for continuous illumination of the hollow bodies as they traverse the loop.

An additional object is to provide timing means for spacing the hollow bodies substantially equally as they are circulated through the closed loop.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of by display device, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawing, wherein:

FIG. 1 is a vertical sectional view through a display device embodying my invention and showing it associated with a panel of a sign or the like;

FIG. 2 is an enlarged sectional view on the line 2—2 of FIG. 1 and includes an electro-diagrammatic view of a source of energization for an electrical field used in connection with my display device;

FIG. 3 is a similar sectional view of a modified form of the display tube, and

FIG. 4 is a diagrammatic view of a modified form of my display device suitable to outline merchandise show windows or the like.

On the accompanying drawing I have used the reference numeral **10** to indicate a panel suitable for signs or other display purposes, having top and bottom flanges **12** and **14** terminating in an upper front flange **16** and a lower front flange **18**. A transparent tube **20** of glass, Plexiglas, Lucite or the like is provided which spans the flanges **12** and **14** as shown in FIG. 1. A hollow body **32** such as thin walled transparent plastic ball is adapted to traverse the tube **20**. For this purpose, a nozzle **24** is provided extending from a fan housing **26** in which a blower rotor **28** is mounted for rotation. The rotor **28** may be

rotated by an electric motor or the like **30** having a geared down pulley **29**.

The hollow body **32** is made to glow by providing it with a gas fill such as neon and/or other gases such as argon, helium, krypton, radon, xenon or the like, an electrical field of high tension current being provided as by means of electrodes **40** and **42** provided with high tension current supplied by a high tension secondary coil **44** of a step-up transformer **46** having a primary coil **48**. The current from the coil **44** may be in the order of several hundred or several thousand volts depending on the gas or mixture of gases used as well known in the neon sign art. Different gases or mixture of gases may be used to produce different colors such as red, green, blue and so on.

Means is provided for recirculating the ball **32** such as a return tube **22** which may be formed of metal, the nozzle **24** being suitably connected therewith and the return tube at a point adjacent the nozzle being provided with discharge perforation **34** so there can be a circulation of air and thereby circulation of the ball **32** (or several balls **32** if desired). The return tube **22** may be provided with a branch **50** to introduce the balls **32** into the circulating system, a cover **52** being provided therefor.

In order to substantially equally space the balls in their traversal of the tube **20** when there are more than one ball, a timing wheel **36** may be provided operated by a belt drive **38** from the motor **30**. Accordingly, the balls **32** are periodically released from the timing wheel as it rotates and enter the circulating air stream to be propelled upwardly through the transparent tube **20**, being illuminated as they pass through the tube, thus providing a spectacular action display for attracting attention to a sign or advertising matter on the panel **10**. The flanges **12**, **14**, **16** and **18** serve to enclose the operating mechanism from view so that only the tube **20** and the balls **32** circulating therethrough are in sight.

As shown in FIG. 3, the tube **20** (indicated **20**^{a} herein) may be modified to have the electrodes **40**^{a} and **42**^{a} imbedded in the wall thereof instead of being exposed as in FIG. 2.

FIG. 4 illustrates a modification of the display system wherein the tube **20** of FIG. 1 is replaced by a tube **20**^{b} forming a rectangular (or other shape) for the purpose of framing a sign, merchandise display or the like. By having the electrodes **40**^{b} and **42**^{b} extend throughout the entire length of the tube **20**^{b} the balls **32** are illuminated throughout their entire path of travel.

From the foregoing specification it will be obvious that I have provided a comparatively simple illuminated display device of the action type wherein moving illuminated bodies are propelled by a simple arangement of air blower. Illumination is effected by passing hollow transparent bodies filled with suitable gas through an electric field formed by a pair of electrodes extending longitudinally of a transparent tube through which the hollow bodies are propelled.

Some changes may be made in the construction and arrangement of the parts of my display device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. In a display device of the character disclosed, a transparent tube, a hollow transparent body movable longitudinally thereof, electrodes extending longitudinally of said tube and adapted to be charged with high tension current to create an electrical field between said electrodes, said hollow body being provided with a fill of

gas which glows when in such electrical field, and means for discharging air into said tube to cause said hollow body to move along the tube.

2. A display device according to claim 1 wherein means is provided to return said hollow body from the outlet end of said tube to the inlet end thereof.

3. A display device according to claim 1 wherein said tube is in the form of a closed loop and said means for discharging air circulates said hollow body through said closed loop.

4. A display device according to claim 3 wherein said electrodes extend throughout the extent of said closed loop.

5. A display device according to claim 3 wherein said closed loop is provided with a branch adapted to receive hollow bodies and introduce them into said closed loop.

6. A display device according to claim 3 wherein a plurality of said hollow bodies are provided, and timing means is operative to space said plurality of hollow bodies substantially equally as they are circulated through said closed loop.

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