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DISPLAY DEVICE

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2 Claims. (Cl. 40—106.22)

This invention relates to a display device, and more particularly to an advertising device which presents an eye-catching display.

Still more particularly, this invention relates to an illuminated display device having novel display effects based upon the utilization of moving bubble streams guided within a liquid filled transparent walled tank, said streams being lighted and guided within said tank in a novel manner to provide unusual visual and display emphasizing effects.

It is, accordingly, an object of this invention to provide a novel display device wherein the movement and lighting effects imparted to bubble or to aerated streams in such device renders the device particularly attractive.

A further object of this invention is to provide a device of the type aforesaid wherein the eye is drawn to display or advertising indicia carried by said device by a novel arrangement whereby air bubbles generated in said device are guided in their path of movement under illumination in patterns to focus attention on such display indicia.

A further object of the invention is to provide in a display device having a liquid chamber through which streams of air are directed, of novel means for generating such streams of bubbles characterized by presenting a substantially equal curtain of bubble streams adjacent the bottom of the chamber.

Still further objects of the invention will become apparent in conjunction with the ensuing description of the drawings, in which—

FIGURE 1 is a perspective view of the device in accordance with my invention as applied to a vending machine or the like;

FIGURE 2 is a vertical section through the device, illustrating diagrammatically the bubble generating and lighting apparatus;

FIGURE 3 is a magnified section, taken on line 3—3 of FIGURE 2; and

FIGURE 4 is a front elevational view of still another embodiment of my invention.

In accordance with my invention, there is provided a tank or enclosure 10 which is optionally, but preferably, comprised of closely adjacent front and rear walls 11 and 12, respectively, the front wall 11 being of a transparent material, such as glass, plastic, or the like. The tank includes, in addition, a top wall 13, a transparent bottom wall 14, and side walls 15 and 16.

Beneath the bottom wall 14 of the tank there is disposed a lighting element 17 or source of illumination, which extends its beam of illumination lengthwise of and beneath the bottom wall 14. The lighting element 17 may be of any type providing sufficient illumination, it being desirable, however, to transfer a minimum of heat from the element to the tank 10. The element 17 when thus positioned will direct light within the tank along a path between the bottom and top of the tank. While the lighting element 17 is shown in the drawings as positioned beneath the lower wall 14, it will be readily understood that said element may be positioned above the top wall 13 of the tank, and said wall made transparent, it being important merely that the primary illumination within the tank be provided by light rays which travel substantially parallel with the walls 11 and 12 to illuminate the full length or greatest dimension.

Desirable lighting effects may likewise be achieved by side lighting, it being merely necessary that the light beams

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projected by the primary light source be within the plane of movement of the streams of bubbles as they progress from the bottom to the top of the tank, and not normal to such plane as would be the case if front or back lighting were employed.

The tank 10 is filled with a liquid, water being suitable for such purpose. There is positioned within the tank and adjacent the bottom wall 14 a conduit 20, provided with apertures 21 evenly spaced apart along the length of said conduit. One end 22 of said conduit is sealed, and the other end 23 extends through the wall 16 of the tank. The end 23 of the conduit 20 is connected to a source 24 of gas under pressure, which source may be a tank of compressed gas but is optionally, and preferably, an air pump. A connecting tube 25 links the conduit 20 with the air source 24, said tube having a portion 26 which is above the level of the fluid in the tank so as to prevent said fluid siphoning back when the air pressure provided by the source 24 is removed from the connecting tube 25.

As an alternative construction, a suitable self-closing valve may be employed to prevent back passage of fluid through the tube 25.

As will be seen in the drawings, the conduit 20 is inclined to the horizontal with the sealed end 22 being slightly elevated with respect to the end 23. This slightly inclined arrangement of conduit 20 has been determined by me to provide a bubble pattern within the tank which is substantially even throughout the entire expanse of the tank adjacent the lower portion thereof whereas, if the conduit 20 were horizontally disposed, bubbles would be discharged at a greater rate from the apertures 21 near end 23 than from the apertures near end 22. However, it will be understood that certain of the benefits of my invention may be achieved without an initially even dispersion of bubbles adjacent the bottom of the tank.

The tank is provided at the top portion with relief aperture or conduit 27 which may include a one-way valve (not shown) to permit the air passing through the fluid in the form of bubbles to escape at the top of the tank. If desired, condensing means draining back into the tank 10 may be incorporated within the conduit 27 so as to minimize the loss of fluid in the form of vapors discharged through the conduit 27.

Within the tank 10 there are provided one or more baffles or bubble guide members 30, said guide members comprising transparent strips of plastic, glass, or the like, having their side marginal edges abutting the front and rear walls 11 and 12 of the tank. The baffles 30 are positioned or curved to provide gradually inclined lower surfaces, and each of said baffles is provided preferably with at least one upturned or upwardly inclined end or discharge portion, such as shown at 31. The baffles 30 are optionally, but preferably, staggered with the tank 10, being arranged at different levels and laterally offset positions within said tank, the arrangement of the baffles being desirably such as to lengthen the path of bubbles emanating from the conduit 20 at the bottom of the tank. The path of the bubbles is lengthened by orienting the baffles so that the bubbles rising in the tank are guided by impinging against the lower surfaces 32 of the baffles 30, whereupon the bubbles will tend to follow such lower surfaces, and be discharged at the upturned end portions 31 of such baffles, thus imparting lateral as well as upward components of movement to said bubbles. The baffles are preferably disposed in the tank in a manner whereby the lower bubble gathering surfaces 32 of some of the baffles are disposed vertically above the discharge ends 31 of other baffles in said tank, and will thereby catch on such bubble gathering surfaces a quantity of the bubbles discharged from the lower baffle.

As seen from the drawings, the arrangement of the

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baffles aforesaid will provide, at points directly above the baffles 30, areas 33 having little or no bubble activity, and beneath the baffles and adjacent the discharge points 31, areas of increased or accumulated bubble activity. I have determined that particularly impressive display of advertising indicia, or the like, may be had where such indicia are disposed so as to coincide with the areas 33 of decreased bubble activity. Such indicia 34 may be positioned within the tank, or may be disposed outside the tank, the desirable effects aforesaid being achieved in either case, where the indicia are disposed adjacent, or within, or superimposed over the aforesaid areas of decreased bubble activity. The term "coincide" as used herein to refer to the position of the indicia with respect to the areas of decreased activity should be understood to refer to an orientation wherein the indicia appears to register with such area, and should be understood to encompass positioning of the indicia within or without the tank. Moreover, the areas of increased bubble activity formed adjacent the discharge points 31 heighten the desirable effects aforesaid by providing a framing or halo-like effect to the sides of the areas of decreased bubble activity.

The effectiveness of the display is likewise heightened by the provision of lighting which travels in a path parallel to the plane of bubble flow. Thus, by bottom or top lighting bubbles, each bubble as it proceeds from the bottom to the top of the tank appears as a spot of light, an effect quite contrary to that obtained by back lighting of the bubbles.

Similarly, the desirable lighting effect aforesaid may be achieved in a measure by side lighting, wherein the primary lighting within the tank is effected by rays which run parallel with, or in the plane of travel of, the bubbles from the bottom to the top of the tank.

The striking lighting effect of the moving screen, stream or line of bubbles produced is heightened by the contrast provided by the absence of substantial back lighting, and while a reflective background may be employed, the use of substantial back lighting is to be avoided since it will reduce the striking effect of the display.

The use of transparent baffles 30 in the tank provides no obstacle to the light effects provided by the bubbles since light is permitted to pass freely through the baffles, thus illuminating bubbles which have passed above the baffle. For the same reason, the display indicia 34, if positioned within the tank, are desirably opaque, but of such thickness as not to cast a shadow or interrupt the passage of light within the tank.

In FIGURE 4 there is shown an embodiment of my invention wherein the wall portions 40 of the tank have been formed to provide the equivalent of a bubble guide surface, thereby adding to the indicia framing effect, much in the same manner as the baffles 30, at the same time presenting a striking overall appearance. In the embodiment of FIGURE 4, the baffles 30 have been provided with apertures 41 extending through from the top to the bottom of said baffles. The apertures 41 are of funnel shape, being wider at the bottom than at the top, and serve to gather some of the bubbles following the lower surfaces 32 of the baffles 30, and permit limited numbers of such bubbles to pass through the areas above the baffles which would otherwise be substantially free of bubble activity. The limited flow of bubbles through such areas

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has been found to be particularly effective when used in combination with transparent tinted display, indicia 42.

The tank or enclosure 10 is preferably provided with an escutcheon or frame F which hides from view the bubble dispensing conduit 20 and light source 17 so as not to detract from the effect of the advertising display.

The advertising device herein described and claimed has been found particularly effective in attracting attention to vending devices, such as beverage or candy dispensers, and the like, when attached thereto, as shown in FIGURE 1, it being understood that the device is not limited to such use.

By varying the positioning of the baffles, the volume of air injected through conduit 20, and by adding coloring to the fluid within the tank 10, a variety of different effects may be achieved, all within the scope of my invention. The continuous movement of bubbles throughout the tank, each of which bubbles appears as a moving spot of light, preferably against a contrasting background, has been found highly effective as an attention-getter. Moreover, the viewers' attention which is initially attracted to the device by the general movement of the lighted bubbles, is thereafter specifically focused upon the display indicia by reason of the framing paths and patterns followed by the bubble streams.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A display device comprising a tank having a rear wall, side walls, and a transparent front wall, a fluid contained in said tank, a source of illumination positioned to direct light within the tank in the path between the bottom and top of said tank, a conduit adjacent the bottom of said tank, said conduit being inclined whereby one end thereof is higher than the other end, a plurality of widthwisely spaced apertures of uniform size formed in said conduit, a source of gas under pressure connected with said other end of said conduit to define a substantially even bubble pattern adjacent the bottom of said tank, baffles in said tank in the form of somewhat inclined transparent strips of substantial length and having edges abutting the front and rear walls of said tank, each said baffle being disposed to collect bubbles impinged against the lower surface thereof and to discharge said collected bubbles at the end portions thereof in concentrated streams, at least one said baffle being positioned in said tank vertically above an end portion of another said baffle so that said upper baffle will collect said concentrated stream discharged from said end portion, and display indicia on said tank being positioned substantially immediately above at least some of said baffles whereby said indicia is framed by said baffles and streams.

2. A device in accordance with claim 1 wherein at least one of said strips is slightly curved and includes an upturned end portion.

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