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THREE DIMENSIONAL ADVERTISING BILLBOARD

FIELD OF THE INVENTION

This invention relates to a method and an apparatus for billboard advertising, and more specifically to billboard advertising via three-dimensional billboards.

BACKGROUND AND SUMMARY OF THE INVENTION

Billboard advertising is a great marketing tool. The underlying requirement for a billboard is that it should be strikingly attractive and should capture the attention of the prospective customer. Billboards are predominantly two-dimensional. Most two-dimensional billboards such as posters are labor-intensive to change the advertisement every time depending upon where they are located (high upon on a tower or a building or in the middle of a busy intersection). Automation and remote operation are not available to most two-dimensional billboards. However, electronic billboards with remote operation capability are becoming popular now. Indeed electronic billboards may be attractive. But, they cannot portray realistic images (other than giant TV screens), especially three-dimensional images, which would be very effective.

Adding a third dimension to a billboard accentuates its utility and appearance. Three-dimensional billboards do exist, such as inflatable billboards and foam billboards. For example, U.S. Pat. No. 4,369,591 and U.S. Pat. No. 4,271,620 disclose three-dimensional billboards. However, those known three-dimensional billboards do not have some of the most desirable features of billboards, which are (1) the versatility to change the advertisement easily and/or remotely, and (2) the capability to provide animation. The present invention is able to incorporate all of these desirable features and offers more flexibility to develop a range of three-dimensional billboards.

The present invention stems from a pin screen device, for example as disclosed in U.S. Pat. No. 4,654,989, U.S. Pat. No. 4,536,980, and U.S. Design Pat. No. Des. 270,317. The pin screen device is primarily an entertaining toy for both children and adults. The pin screen toy currently available in stores measures approximately 6"×4"×3". It chiefly comprises two parallel plates with an array (or matrix) of holes in which metal pins can move in and out of the plane of the plates with pin ends forming the three-dimensional figure's surface.

An object of the invention is to provide a three-dimensional billboard which has the versatility to change the advertisement easily and/or remotely, and the capability to provide animation.

This and other objects have been achieved according to the present invention by providing a three-dimensional advertising billboard, including a board having a surface defining a plane. The board defines a plurality of holes arranged in a matrix. A plurality of rods are slidably mounted in the holes such that the rods are movable relative to the plane. At least one actuator is operatively coupled to the plurality of rods. The at least one actuator is capable of moving each of the rods independently of the other rods. A controller is coupled to the at least one actuator. The controller is operable to move the rods to desired respective positions such that outer ends of the rods define a three-dimensional display.

The present invention utilizes multiple innovative features to achieve a versatile three-dimensional billboard. The

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size of the present three-dimensional billboard varies based on the application of the billboard and the desired viewing range, but is typically much larger than the above-mentioned pin screen toy. The cross-sectional area of the plate can be as small as 1 foot by 1 foot and as big as 100 ft by 100 ft or larger. The diameter and length of the rods and the diameter of the holes receiving the rods are also typically much larger than the metal pins and holes of the pin screen toy (usually about 1/16" in diameter). The rods of the present invention may be made of various materials, for example plastic, foam or metal, which may be either solid or hollow, but are preferably lightweight. The size of the rod is determined by the size of the billboard and the resolution required for the three-dimensional image. The rod may have various cross-sectional shapes, for example circular, hexagonal, or any other shape.

The rods can be moved manually or by a physical mechanism (e.g., mechanical, electromechanical, electromagnetic, electrostatic, thermo-mechanical, phase-change materials, pneumatic, hydraulic, etc.). The rods can be moved from a remote location. The rods can be returned to normal position by providing a spring return mechanism. Also the ends of the rods, i.e., the rod-ends that form the profile of the three-dimensional image, can be monochromatic or multi-colored to produce vivid color three-dimensional displays. The rods can be opaque or transparent. The transparent rods can be fiber optic rods which transmit light.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a three-dimensional advertising billboard according to a preferred embodiment of the present invention;

FIG. 2 is a sectional side view taken along a vertical plane X—X of FIG. 1, showing a three-dimensional advertising billboard according to the invention similar to that of FIG. 1;

FIG. 3 is a detail view of a preferred embodiment of the framework that supports the movable rods;

FIG. 4 is a sectional side view similar to that of FIG. 2 wherein an elastic membrane is placed in front of the rod-ends; and

FIG. 5 is a perspective view of an example of a three-dimensional profile of a car on a three-dimensional advertising billboard according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

As shown in FIG. 1, a framework 1 such as a vertical solid board, which can be made of a light weight material such as foam, plastic or wood, defines a matrix of holes 2. The configuration of the matrix (i.e., the configuration defined by adjacent ones of the holes 2) need not be square, as shown in the illustrated embodiment, but typically should be regular, i.e., the adjacent holes 2 should define a regular polygonal shape, e.g., triangular, square, rectangular, pentagonal, hexagonal, octagonal, etc. The matrix may have the same configuration over the entire surface of the billboard, or the matrix configuration may be varied in different areas of the billboard. For example, it may be desired to have a frame area at the outer periphery of the