

[54] ANIMATED DISPLAY DEVICE

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[22] Filed: Oct. 1, 1971

[21] Appl. No.: 185,555

[52] U.S. Cl. 40/106.52, 40/106.31, 40/130 K

[51] Int. Cl. G09f 11/12, G09f 13/18

[58] Field of Search 40/106.52, 106.51, 40/106.53, 106.54, 106.3, 106.31, 130 K

[56]

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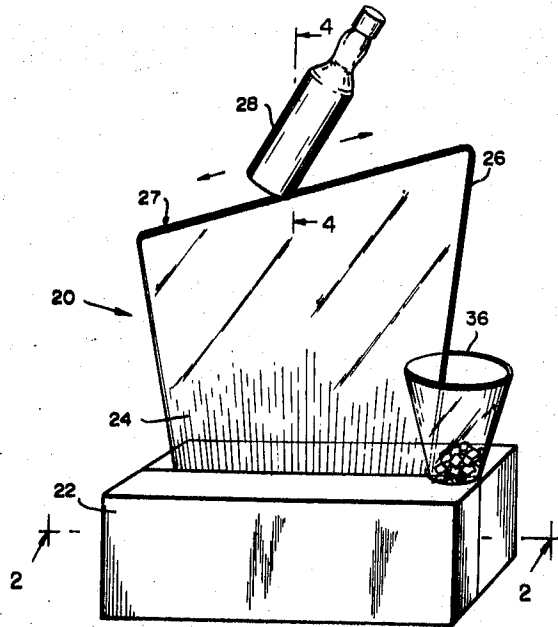
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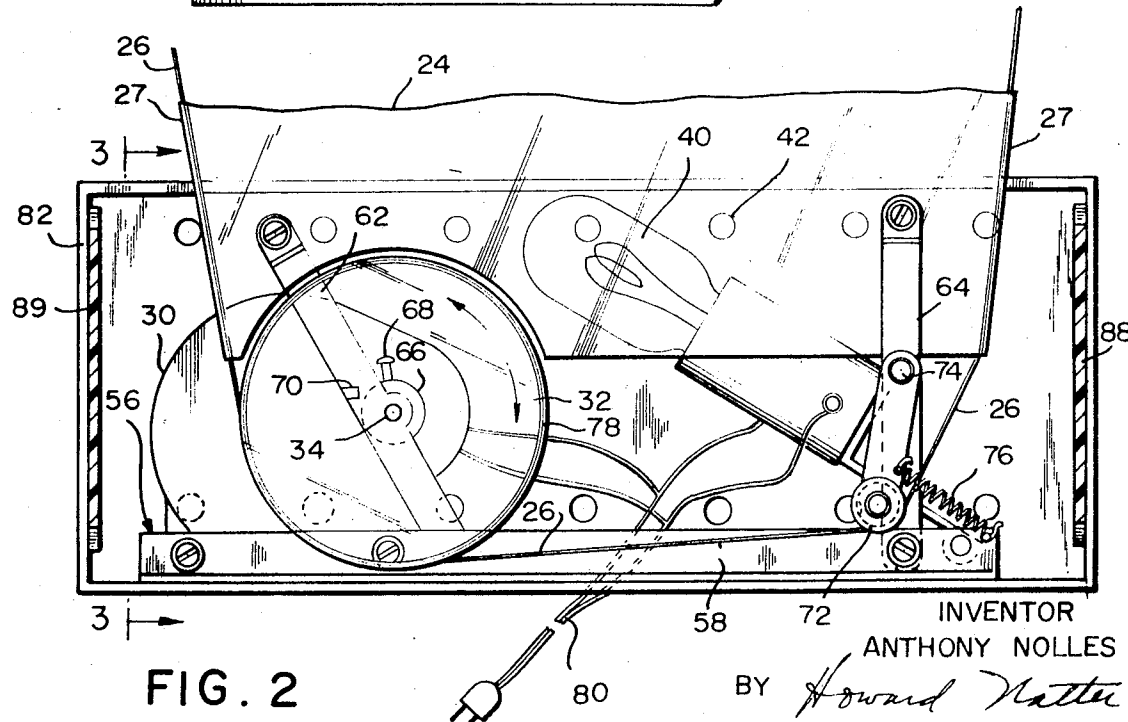
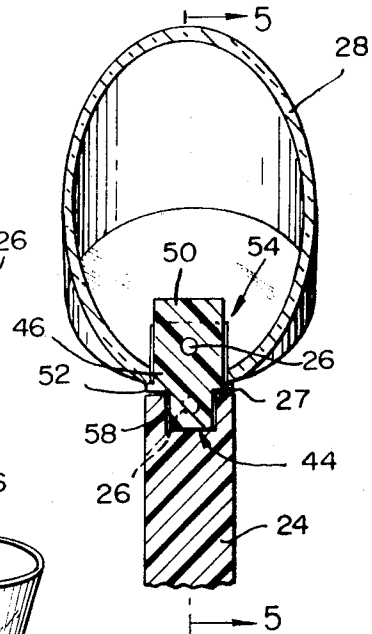
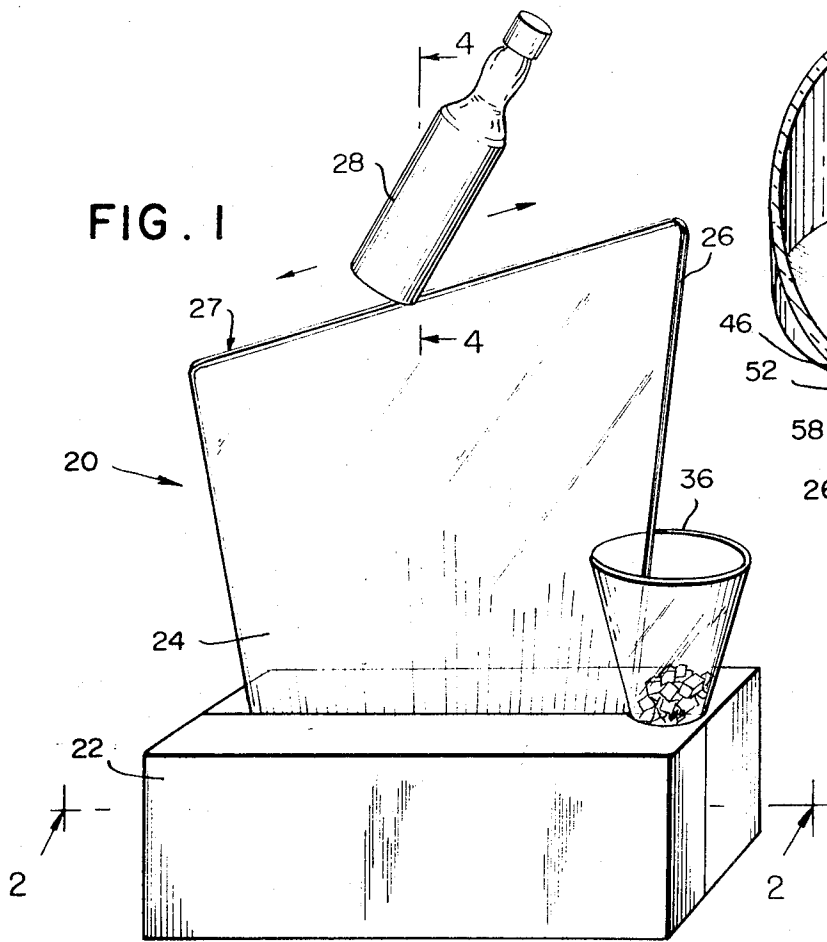
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ABSTRACT

An animated three-dimensional display having a pellucid panel member supported by a pedestal. An object or article to be displayed is attached to a movable conveyor aligned peripherally around an edge of the panel member. The conveyor is visually concealed, especially when viewed perpendicularly to the plane in which the panel member is located, preferably by means of internal light transmission through the panel member which illuminates the edge and thereby screens the conveyor. A motor and drive arrangement for propelling the conveyor and a light source for illuminating the panel member are housed within the pedestal. The pedestal is constructed with frictionally interlocking parts to facilitate disassembly thereof and to permit accessibility to the elements housed therein.

9 Claims, 9 Drawing Figures





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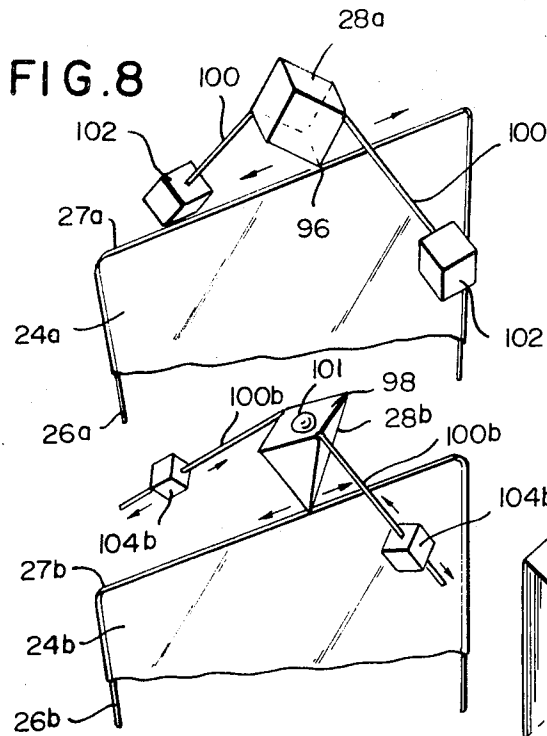


FIG. 9

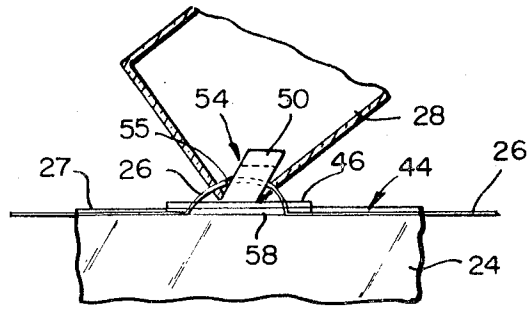


FIG. 5

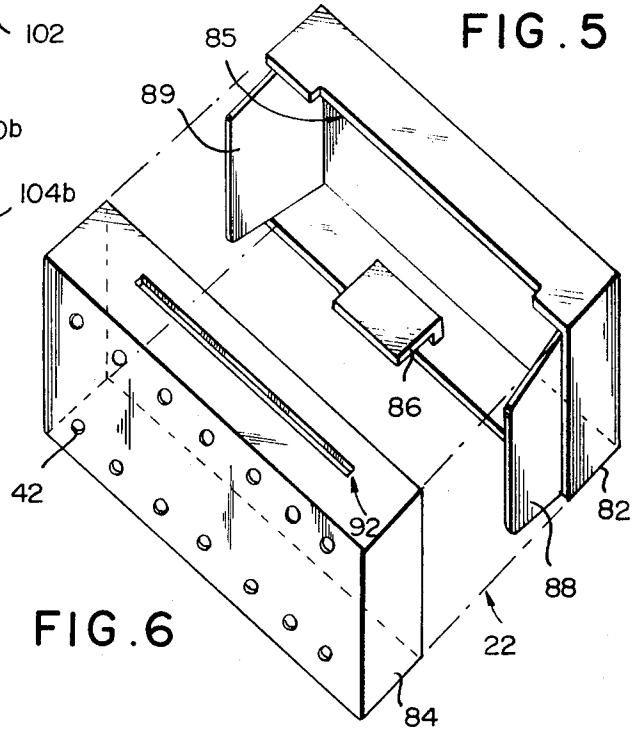


FIG. 6

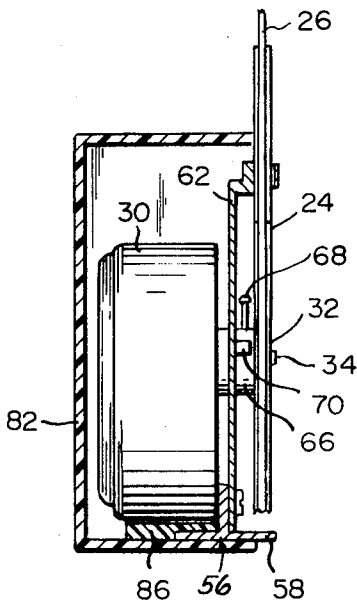


FIG. 3

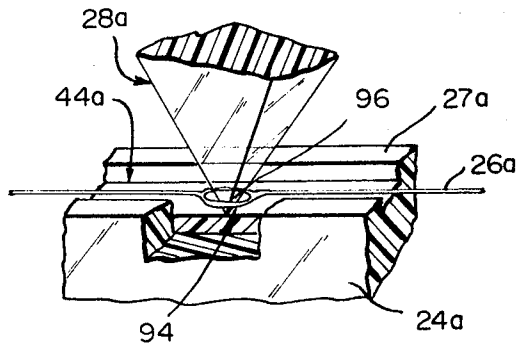


FIG. 7

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ANIMATED DISPLAY DEVICE
BACKGROUND OF THE INVENTION
FIELD OF INVENTION

This invention relates to display or exhibiting devices and especially to an animated three-dimensional display.

In particular, this invention is concerned with an advertising display wherein an object such as a replica or miniaturized facsimile of a product being promoted or other article is moved in a manner to attract attention. The article movement is particularly eye catching because the means for supporting and propelling the article are concealed from view and thus create an unusual and somewhat perplexing optical illusion.

Conventional advertising displays using movable objects to attract attention are generally operated by mechanical means which frequently include a track or conveyor and motive means, the operation of which are readily seen or apparent to the observer. Since the effectiveness of an advertising display is often determined in part by its attention attracting qualities, these prior art devices do not achieve the maximum potential for promotional purposes. Another disadvantage of these presently used displays is the fact that they are rather complex in construction, and relatively inaccessible for maintenance and the repair and replacement of parts.

BRIEF SUMMARY OF THE INVENTION

The instant invention is designed to overcome the aforementioned disadvantages, and accordingly is constructed such that an article to be displayed is positioned along an edge of a panel member in a manner so as to avoid the appearance of any obvious connecting structure for supporting or moving the article. This can be accomplished by fabricating the panel member from a pellucid, i.e., transparent or translucent sheet of internal light transmitting material such as plastic. By utilizing a remote light source, the edge of the panel member may be illuminated, and the resultant light glow will effectively screen a conveyor, particularly when viewed perpendicularly to the plane of the panel member. The conveyor may also be screened by providing a peripheral groove in the edge of an opaque panel member and by aligning the conveyor therein.

An additional feature of this invention includes attachment or coupling means for removably fastening an article to the conveyor in various spatial orientations. The illusory visual effect is intensified by positioning the article so that it appears to be delicately balanced along the edge of the panel member in a rather precarious fashion. Furthermore, various objects may be interchangeably attached by the coupling means to the conveyor either singularly or in combination. In a preferred embodiment, a reciprocating movement is imparted to the conveyor so that the article moves alternately backward and forward along a selected portion of the edge.

In other embodiments, the article being supported on the conveyor is designed as a cube shaped mobile and/or an inverted pyramid with a base forming a display shelf upon which small items, e.g., jewelry can be exhibited.

A pedestal for supporting the panel member, preferably in an upstanding position, also houses a motor for propelling the conveyor, and a light source for illuminating the panel member.

It should be noted that a further feature of the invention resides in the pedestal member which is comprised of two mating or complementary half sections, each section being adapted for frictional interlocking or snap fitting engagement without the use of any screws or other securing devices requiring tools. Consequently, the pedestal is easily disassembled by firmly pulling the sections apart to separate same and to thereby expose the mechanical elements and light source housed within the pedestal.

The animated display device of this invention may additionally have other applications, such as for amusement purposes and may conceivably be used as a toy or game. Furthermore, by using plastic materials having various shapes and colors and/or original and creative designs, the device may be defined as in the general category of a sculpture or a work of art. The movable article, for example, can be a delicately balanced and freely flowing mobile and the entire composition could not only have ornamental or decorative value, but could also be considered a characteristic form of modern art, or a museum display piece.

Having thus summarized the invention, it will be seen that an object thereof is to provide an animated display of the general character described herein which is not subject to the foregoing disadvantages of the prior art.

Specifically, it is an object of the instant invention to provide an animated display wherein an article is moved by means not apparent to an observer.

Another object of this invention is to provide an animated display device wherein an article is attached to a conveyor positioned around the edge of a pellucid panel member and concealed from view by means of internal light transmission through the panel member and the edge illumination thereof.

It is a further object of this invention to provide an animated display device wherein a panel member is supported by a pedestal and motive means for propelling the conveyor as well as a remote light source for illuminating the panel member are housed within the pedestal.

A still further object of this invention is to provide an animated display device wherein the pedestal includes mating sections designed for frictional interlocking engagement to facilitate disassembly and access to the elements housed within the pedestal.

The above and other objects, features and advantages of the invention will be apparent from the following description of the preferred embodiment when considered in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, in which are shown the preferred embodiments of the invention,

FIG. 1 is a perspective view of the animated display device of this invention and shows an upstanding panel member mounted to a pedestal, a miniaturized bottle coupled to a conveyor for movement along an edge of the panel member and a glass resting on the pedestal;

FIG. 2 is an enlarged partial sectional view taken along line 2-2 of FIG. 1 and shows the motive means housed within the pedestal for propelling the conveyor, including a motor, a drive wheel and an idler pulley; additionally, a lamp is positioned therein for illuminating the panel member;

FIG. 3 is an auxiliary sectional view taken along line 3-3 of FIG. 2 and shows the motor connection to the

drive wheel, including abutment means for contacting a stop member to cause periodic reversal of the direction of motor rotation for imparting a reciprocating movement to the conveyor and attached article;

FIG. 4 is an enlarged partial sectional view taken along line 4—4 of FIG. 1 and shows the edge of the panel member including a peripheral groove and coupling means adapted to be slidably received within said groove for removably securing the bottle;

FIG. 5 is an auxiliary sectional view taken along line 5—5 of FIG. 4 and illustrates the coupling means including a carriage member having an upstanding projection adapted to be received within an opening in the bottle;

FIG. 6 is an exploded perspective view of the pedestal which shows two mating sections adapted to be frictionally interlocked for snug fitting engagement, one of said sections being provided with a projection aperture and a plurality of vent openings;

FIG. 7 is an enlarged perspective view with a portion broken away, of a modified embodiment wherein a conveyor is provided with a loop coupling means for engaging a corner of the object to be moved;

FIG. 8 is a partial perspective view showing a delicately balanced mobile having outstanding balance arms and adapted to be moved along an edge of the panel member by the loop coupling means, and

FIG. 9 is a partial perspective view of another embodiment wherein an inverted pyramid shaped display shelf is adapted to be moved along an edge of the panel member by the loop coupling means, the outstanding balance arms are provided with adjustably positioned counterbalance weights for changing the angular position of the pyramid display shelf.

DETAILED DESCRIPTION OF THE INVENTION

Referring now in detail to the drawings, the reference number 20 denotes generally the animated display device of this invention. The device 20 is comprised of a pedestal 22 and a panel member 24 mounted thereto. A conveyor 26 is provided for movement peripherally around an edge 27 of the panel member 24 and is adapted to move an object 28 such as the miniaturized bottle as shown in the drawings. Reciprocal movement is imparted to the conveyor 26 by means of a self-reversing motor 30 and a drive wheel 32 connected by an output shaft 34 which will be further described hereinafter.

As shown in FIG. 1, a glass or tumbler 36 partially filled with simulated ice cubes is positioned around the edge 27 of the panel member 24 to depict pouring the contents of the bottle into the glass 36 and to further enhance the overall optical illusion. The panel member 24 is preferably made of a pellucid material such as glass or plastic which is either transparent or translucent so that when viewed perpendicularly to the plane of the panel member 24, vision through the panel member 24 is unobstructed and no means for supporting or moving the bottle 28 are visible.

As previously mentioned, a primary feature of this invention is the screening of the conveyor 26. This is achieved by illumination of the edge 27 by means of internal light transmission or light piping, a phenomena characteristic of materials such as plastics, especially acrylic plastic. It has been found that with these plastics, there is almost no absorption of light rays passing through, but rather the light rays entering the plastic

are entirely reflected by the boundary surfaces defining the opposed faces and will remain within the plastic until they reach an edge or intermediate point in the plastic where the surface has a discontinuity or is provided with interruptions such as caused by scribing, edging, engraving, beveling, etc. It should thus be apparent that any design, copy, etc., placed in the panel member 24 by one of the above mentioned means will be illuminated along with the edge 27 be illuminated.

The internal reflection is dependent on the angle of incidence at which the light rays strike the boundary surfaces in the plastic. The closer the angle of incidence is to a line perpendicular to the surface, the greater the possibility that light will escape rather than be internally reflected. Conversely, with outside light striking the plastic, the closer the rays are parallel to the boundary surface of the plastic, the greater the possibility that they will enter and be transmitted through the plastic. Thus, a critical angle of incidence can be determined and used advantageously so that light rays may be transmitted some distances through plastic and even along a curved path.

The animated display device of this invention preferably employs a panel member 24 which is a planar sheet of acrylic plastic approximately one-eighth of an inch thick having opposite faces which are parallel. The internally reflected rays will be rebounded from one boundary surface to another and accordingly will advance lengthwise through the material from a light source to illuminate the edge 27 and produce a glow which enshrouds the conveyor 26. It has also been found through experimentation that illumination is most effective when the plastic used is either orange, red, yellow, green or white in color.

In the preferred embodiment, a filament lamp 40 is mounted within the pedestal 22 adjacent the panel member 24 and thus provides a light source for illuminating the edge 27. A plurality of vent holes 42 are also provided in the pedestal 22 to help dissipate the heat generated by lamp 40. Alternatively, a fluorescent lamp may be substituted for the filament lamp 40 to reduce the amount of heat generated. It has also been noted that even without lamp 40 or other concentrated light source, some light rays from the natural environment or surroundings will also enter the panel member 24 to provide some illumination of the edge 27. The device however is adapted to work most effectively in a darkened atmosphere wherein the edge 27 takes on a glowing luminescence which veils or screens the conveyor 26.

In order to properly align the conveyor 26 and to insure smooth movement thereof, a groove 44, which is rectangular as shown in FIG. 4, but may assume a "V" or other shape, is provided peripherally along the co-terminous portion of edge 27 over which the conveyor 26 moves. Furthermore, and in order to attach or couple an object 28 to the conveyor 26, a carriage member 46 is used and slidably accommodated within groove 44. The carriage member 46 has a longitudinal slide portion 58 and an upstanding projection 50; the projection 50 has a shoulder 52 which rides on the edge 27. The projection 50 is especially adapted to be accommodatedly received in a recess or opening 54 provided within the object 28, and will thus removably secure the object 28 to the conveyor 26 for movement along the edge 27. The carriage member 46, in turn, is secured to the conveyor 26 for movement therewith. This

may be accomplished, as illustrated in FIGS. 4 and 5, by passing the conveyor 26 through the carriage member 46 and by providing fastening means such as placing a knot 55 therein to prevent relative movement between the carriage member 46 and the conveyor 26.

The conveyor 26 is preferably an endless band or belt such as a thin nylon strand. A non-filament high tensile wire commonly used for fishing line has been found particularly effective. A self-reversing motor 30, e.g., such as that manufactured by "Handcraft Company" of Reedsburg, Wisconsin, Model PX 100, may typically be used to propel the conveyor 26. The motor 30 is mounted to a chassis 56 which has a base member 58 adapted to be secured to the pedestal 22 as will hereinafter be described. The chassis 56 contains two upstanding leg members 62 and 64 which engage and firmly hold the panel member 24. The output shaft 34 from motor 30 rotates a drive wheel 32 and is also provided with a reversing mechanism including a collar 66 having a projection or stop member 68 which is in registration with an abutment member 70 affixed to the leg member 62. During each revolution of the drive wheel 32, the stop member 68 engages the abutment member 70 to reverse the rotation of the motor 30 and will thus impart a reciprocating movement to the conveyor 26. The size or diameter of the drive wheel 32 can be predetermined such that a desired length of travel in each direction for the conveyor 26 and attached object 28 is achieved. For example, length of travel can be adjusted so that the object 28 will move along the edge 27, both in a generally horizontal direction and also in a generally vertical direction. In fact, if a continuous movement in one direction around the panel member 24 is desired, the stop member 68 and abutment member 70 can be eliminated; such a modification is within the scope of this invention and will be further discussed hereinafter.

To further guide the conveyor 26 and in order to impart the proper tension thereto, an idler wheel 72 is pivotally mounted by pin connection 74 to leg member 64. A spring 76 resiliently urges the idler wheel 72 in order to maintain the proper tension in the conveyor 26. Additionally, a frictional gripping means such as a rubber band 78 may be placed circumferentially around the wheel member 32 to prevent slippage of the conveyor 26 while being propelled. The lamp 40 previously mentioned is attached to the chassis 56 and positioned adjacent panel member 24 as shown in FIG. 2. Both the lamp 40 and motor 30 are operated by conventional house current introduced by means of wire conductor 80.

The pedestal member 22 is comprised of two mating sections 82 and 84. Section 82 is provided with a notched portion 85 for receiving the panel member 24 and also has a recessed lip 86 which engages the base member 58 of chassis 56 (see FIGS. 3 and 6) to form an integral support unit. Two projecting tabs 88 and 89 are insertable into section 84 and can be frictionally engaged therein. The sections 82 and 84 are thus capable of a snug fitting interlocked relationship and can easily be pulled apart and disassembled when necessary. Section 84 is also provided with a projection aperture 92 designed to project light from lamp 40 upwardly toward the object 28 to thus illuminate the object 28 as it moves along the edge 27. A plurality of vent holes 42 serve to dissipate the heat generated by lamp 40.

In a typical application, the display device may be used, for example, in a dimly lighted restaurant, bar or tavern and a miniaturized bottle of liquor can be attached to the conveyor 26 for movement along the edge 27 in a generally horizontal direction. The light from lamp 40 will be transmitted through the panel member 24 to illuminate edge 27 and effectively screen the conveyor 26. Additionally, the light projected through aperture 92 will attract attention to the bottle and brand label thereon. Furthermore, the product name or other message may be inscribed in the panel member 24 and will accordingly be illuminated.

In a modified embodiment shown in FIGS. 7 and 8, an edge 27a of a panel member 24a is provided with a groove 44a for accommodating a conveyor 26a. Means for attaching or coupling an object 28a to be transported along the edge 27a is accomplished by providing a loop 94 as shown in FIG. 7. A projecting angle or corner 96 of the object 28a, which may be shaped as a cube, pyramid, etc., can readily be engaged by the loop 94 on conveyor 26a and may thus be transported along edge 27a. In order to achieve an interesting optical effect, the object 28a in the form of a transparent cube, is balanced on edge 27a and has a plurality of outstanding balance arms 100 and counterbalancing weights 102, thus forming a freely moving mobile. The center of gravity of the object 28a will be at a point below the edge 27a and it will not readily topple from the panel member 24a, although it may appear to be precariously balanced as it moves along edge 27a.

In another embodiment shown in FIG. 9, an object 28b, in the form of an inverted pyramid, is attached to a conveyor 26b placed around an edge 27b of a panel member 24b. A loop, such as loop 94 shown in FIG. 7 may be used for attaching the object 28b to the conveyor 26b. A flat surface 98, which is the base of the pyramid, can be used as a shelf to hold and display small items 101, such as jewelry. Furthermore, a plurality of balance arms 100b are provided with counterbalancing weights 104b which are frictionally held in place along the arms 100b. By adjusting the position of these weights 104b along the length of the balance arms 100b, the orientation of the display surface 98 may be selectively varied and/or changed. The pyramid, similar to the cube previously described, will have a center of gravity below the edge 27b of panel member 24b and thus will not readily be toppled therefrom.

It should further be apparent that other objects and/or articles may be attached to a conveyor, e.g., a golf ball. An interesting display effect may be achieved by employing a motive means for imparting to the conveyor a continuous or intermittent movement in one direction rather than a reciprocating movement. This can be achieved by eliminating the stop and abutment members previously mentioned, or by employing any conventional motor. A pedestal provided with two holes or openings adjacent an edge thereof will permit passage of an object therethrough. The object, such as a golf ball, may be attached to the conveyor, and for an added effect one of the holes can be made to depict a golf green and a replica of a golf tee may be placed in the panel member adjacent an edge, so that the golf ball may appear to be resting thereon. Movement of the golf ball from the tee and into the hole may be controlled by remote or automatic switches. Illumination of the edge of the panel member will screen the con-

veyor in a manner similar to the displays previously described.

As other possible embodiments might be made of the present invention, and as various changes might be made in the embodiments set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, there is claimed as new and desired to be secured by Letters Patent:

1. An animated display device using a movable object for effectively attracting and holding the attention of an observer, said device being comprised of a pedestal member, a panel member capable of internal light transmission mounted to said pedestal member, said panel member being adapted for displaying a moving object along a selected portion thereof, conveyor means contiguous to said selected portion for propelling the object along a predetermined path of travel, motive means for driving the conveyor means, and screening means integral with the panel member including a peripheral edge coincident with said selected portion of the panel member, whereby internally transmitted light will escape to illuminate the selected portion and thereby conceal the conveyor means.

2. An animated display device as claimed in claim 1 further including a remote light source comprised of a lamp mounted within the pedestal and positioned adjacent the panel member for providing illumination to said selected portion of the panel member.

3. An animated display device as claimed in claim 1 wherein the peripheral edge defines a groove therein and the conveyor means includes an endless band aligned around the panel member and positioned within said groove, and further including attachment means affixed to said endless band for removably securing an object to be transported along said edge.

4. An animated display device as claimed in claim 3 wherein the attachment means is comprised of a carriage member adapted to be slidingly accommodated in

said groove, said carriage member further including a projection therefrom, said projection being receivable within said object to secure the object to the edge of the panel member.

5. An animated display device as claimed in claim 4 wherein the pedestal member is comprised of mating sections, at least one of said sections having tabs adapted to be received by the other of said sections in snug fitting engagement, and further including a light projection aperture defined in said pedestal to permit illumination of the moving object.

6. An animated display device as claimed in claim 3 wherein the attachment means is comprised of a loop portion formed in said endless band and adapted to receive a projecting angle of the object to thereby secure the object to the endless band for movement along said edge.

7. An animated display device as claimed in claim 3 wherein the motive means includes a motor, a drive wheel rotated by said motor, said drive wheel being adapted to frictionally engage and propel the endless band, and further including pulley means for guiding and maintaining tension in said endless band.

8. An animated display device as claimed in claim 1 wherein the pedestal member is comprised of mating sections adapted for frictional interlocking and includes support means housed within the pedestal member for securing the conveyor drive means and panel member, at least one of said mating sections being detachably engageable with the support means to thus form an integral unit which can be readily disassembled when necessary.

9. An animated display device as claimed in claim 1 wherein the object to be displayed is moved reciprocally along a generally horizontal peripheral edge of said panel member and has at least two balance arms extending outwardly therefrom including a counterbalancing weight whereby the center of gravity lies at a point below the peripheral edge for improved stability.

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