

1

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ADVERTISING DEVICE
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The invention relates generally to advertising devices and more particularly to an advertising device of the type having a rotating display. The display may for example be a cylinder bearing an advertising message, or a model of a product. As the display rotates, it continuously brings into view successive lines of the advertising message, or various views of the model.

An object of the invention is to provide a novel rotating advertising device.

Another object of the invention is to provide a novel advertising device which clothes itself with an aura of mystery. This effect is produced because the display rotates without any visible drive mechanism. The effect may be enhanced when the rotating member is supported merely by a thin invisible wire.

Another object of the present invention is to provide a novel rotating advertising device which is compact. Because of its compactness the device may be small enough to be mounted on the forward edge of a merchandise bearing shelf, such as a shelf in a supermarket, without interfering with the placement and removal of merchandise.

It is another object of the invention to provide a novel rotating advertising device which is self-contained having its drive mechanism and power source situated inside the rotating display.

Still another object of the present invention is to provide a novel rotating advertising device which may be easily set up and taken down, by a person who does not have special skills or training.

Another object of the present invention is to provide a novel rotating advertising device whose display rotates only when it is placed in its supports, and which does not require a switch to turn it on.

According to the invention there is provided a device comprising a frame; an electric motor mounted on said frame; said motor having a pair of electrical inputs and a mechanical output shaft; said motor adapted to rotate its output shaft when energized by an electric potential being impressed across its inputs; a battery mounted on said frame; said battery having a first electric terminal, and a second electric terminal, and providing therebetween a potential sufficient to energize the motor; said first electric terminal being connected to one of the motor inputs; a housing surrounding said battery motor and frame; said housing being mechanically connected to the output shaft of the motor, and adapted to be rotated by said shaft; a shaft co-axial with said axis of rotation of said housing, mounted on the frame and extending from opposite ends of said housing, the ends of said shaft being electrically insulated from each other; one of said ends being electrically connected to the second terminal of the battery, and the other of said end being connected to the other of the motor inputs; and means connected to the ends of said shaft for mechanically supporting said shaft and also providing an electrical contact therebetween, to close the electrical path between the second terminal of the battery and the other input of the motor.

These and other objects and features of the invention are pointed out in the following description in terms of the embodiments thereof which are shown in the accompanying drawing. It is to be understood, however, that the drawing is for the purpose of illustration only and is

2

not a definition of the limits of the invention, reference being made to the appended claims for this purpose.

In the drawing:

FIG. 1 is a perspective view of an advertising device constructed in accordance with the invention and mounted in operative position on a shelf.

FIG. 2 is a front elevation of the device shown in FIG. 1, having part of the rotating drum cut away to show the internal mechanism of the device.

FIG. 3 is a front elevation of an alternative embodiment of the invention.

Referring now to FIGS. 1 and 2 there is shown therein a rotating display 10 mounted in a support bracket 12. This display has a drum or cylindrical surface 14, on which successive lines of an advertising message are written, and two end portions 15 and 15a. Extending from the end portion, and co-axial with the axis of rotation of the drum are two stationary shafts 16 and 16a. These shafts are insulated from each other, for reasons which will become apparent later. The shafts 16 and 16a are mounted respectively in a hole 17 and slot 18, on the arms 19 and 19a of the support bracket 12. The bracket 12 is fabricated of an electrical conducting material and for reasons which will become apparent later, provides an electrical conducting path between the walls of the hole 17 and slot 18. The bracket 12 is secured to a shelf 20 by a clamp 21 (partially shown) which is of a conventional design. Alternatively, the bracket could be snapped into a price tag trough 21A on the edge of a shelf 20.

The drum 14 rotates about the shafts 16 and 16a. The mechanism which drives the display is shown in detail in FIG. 2, wherein the cylinder 14 is cut away. There is shown a main frame 22 supporting, on opposite ends, the stationary shafts 16 and 16a. Shaft 16a is shown here as a bolt, the head of which 23a is on the inside of the frame 22 with its shank passing through the end of the frame. A nut 24 secures the bolt to the frame. An electrical insulating grommet 25 is placed between the head 23a, nut 24 and frame 22; and insulates the bolt 16a from the frame 22. At the opposite end of the frame 22, the other shaft 16 is securely attached to and in electrical contact with the frame.

Mounted on the frame is an electric motor shown in its housing 30. The motor has a pair of electric input terminals 31 and 32, and a mechanical output shaft 33. The motor is capable of rotating its output shaft 33 when an electric potential is impressed across the inputs 31 and 32. Output shaft 33 is connected by a gear 36 and pinion 37 to an input shaft 38 of a standard speed reduction gear train whose housing 40 is shown. An output shaft 41 of the gear train has a drive pinion 42. Pinion 42 engages a spur gear 45 which is mounted on and freely rotatable about shaft 16; and which is firmly attached to the end portion 15.

End portion 15 is shown here as a friction plug having an outwardly sloping annular collar 47 terminating in an annular radially outwardly extending ledge 48. The collar 47 fits snugly against the inner wall of the cylinder 14; and the ledge 48 keeps the plug from going too far into the cylinder 14. A spacer sleeve 50, co-axial with the shaft 16 is securely mounted to the shaft 16 and performs the dual function of keeping the plug 15 and gear 45 in proper spatial position on the shaft 16 and of keeping the rotating display 10 from rubbing against the arm 19.

A similar construction is made on the opposite end of the display 10. Here, end portion 15a is also a friction plug having an outwardly sloping annular collar 47a terminating in a radially outwardly extending ledge 48a. Collar 47a fits snugly against an inner wall of the cylinder 14, and ledge 48a keeps the plug 15a from projecting too far into the cylinder. At this end there is also a spacer sleeve

50a, co-axial with the shaft 16a. But sleeve 50a unlike sleeve 50 is rotatably mounted on its plug 15a between a pair of annular collars 51a and 51b located at the inner end of sleeve 50a. The inner collar 51a extends inwardly from the plug 15a and abuts the nut 24. The plug 15a is held in position on the shaft 16a by a nut 52 mounted on the shaft 16a. Nut 52 is tightened against the circumferential outer edge 53 of spacer sleeve 50a so that the sleeve 50a is firmly held between nuts 52 and 24. The plug 15a is of course free to rotate about the sleeve 50a.

Also mounted on the main frame 22 are a pair of batteries 55 and 55a. The batteries are connected in series and provide a sufficient potential to energize the electric motor 30. The positive terminal 56 of the battery 55 is connected to the motor input terminal 31, and the negative terminal 57 of the battery 55a is connected to the shaft 16a, which, it has been noted, is insulated from the main frame 22. The second motor input terminal 32 is connected to the main frame by a conductor 58.

To facilitate installation and removal of the batteries there is provided a pair of battery spring clips 61 and 61a and terminal connections 62 and 62a. Each clip is itself secured to the main frame 22, and resiliently holds the battery in place. The battery terminal connections 62 and 62a include contact supports 64 and 64a, bolted onto the main frame 22 and positioned at opposite ends of the pair of batteries near the positive terminal 56 and the negative terminal 57. Each support 64 and 64a holds a battery terminal contact cup 65 and 65a respectively, which is electrically insulated from the support by means of insulating grommets 66 and 66a. The supports 64 and 64a are made of a spring like material and exert tension against the positive and the negative terminals 56 and 57 respectively, to maintain firm contact therewith. Contact cup 65 is connected by a conductor 67 to motor input 31. The ends of the conductor are soldered in place. Contact cup 65a is connected by a conductor 68 to shaft 16a. One end of the conductor is soldered to a spade terminal 69 which is slipped over the shank of screw 16a adjacent to the head 23a, and is held in place by the tight fit between the head 23a and the grommet 25. To improve the electrical contact, a metallic washer 70 may be placed between the spade terminal 69 and the insulator grommet 25.

When the display 10 is separate from the frame 12 there is no completed or closed electric circuit between the motor 30 and the series connected batteries 55 and 55a. This will be appreciated by noting that although the motor terminal 31 is directly connected to the positive terminal 56 of the battery 55, the other motor terminal 32 is not connected to the negative terminal 57 of the battery 55a. In particular, the second motor terminal is connected to the shaft 16 (by conductor 58 and the conducting frame 22); while the negative terminal 57 is connected to the shaft 16a by conductor 68. The shafts 16 and 16a are electrically insulated from each other, and the circuit between negative terminal 57 and terminal 32 is open. When the display is mounted in frame 12, this circuit is closed. Frame 12, as noted above, is made of an electrically conductive material and provides a conducting path between the terminal 57 connected to the shaft 16a, and the motor terminal 32 connected to the shaft 16.

The electrical circuit will now be traced in detail. Beginning at positive terminal 56 the circuit is as follows: Positive terminal 56, contact cup 65, conductor 67, motor terminal 31, the motor housed in housing 30, motor terminal 32, conductor 58, frame 22, shaft 16, support 12 (viz., wall surrounding hole 17, arm 19, central member of support 12, arm 19a, wall of slot 18), shaft 16a, terminal 69, conductor 68, contact cup 65a, to the negative terminal 57 and batteries 55a and 55 to positive terminal 56. The circuit may be opened between shafts 16 and 16a by removing the display 10 from the support 12. Mechanically the circuit is closed as follows: Shaft 16 fits into hole 17 in the arm or slat 19 of the support bracket 12, and shaft

16a fits into slot 18 in the arm or slat 19a of the support bracket 12 and secured thereon by a nut 90 which is threadedly engaged by the shank of shaft 16a, said nut abutting the arm 19a.

With the circuit closed and the motor energized, output shaft 33 rotates which in turn rotates pinion 42 and gear 45 engaged by said pinion, and the gear 45 which is attached to end plug 15 which in turn is attached to cylinder 14, causes rotation of said plug and said cylinder. When the display 10 is removed from the bracket 12, the circuit is broken and the motor and cylinder stop. To start again, the display is replaced in the bracket. If the motor is of the self starting variety it will begin as soon as the circuit is closed; if not self starting, the drum may have to be rotated manually to start the motor.

Referring now to FIG. 3, there is shown therein the rotating display 10 of FIGS. 1 and 2 mounted in an alternative supporting bracket 112. The bracket 112 is shown as a single metal wire, the ends of which are fastened to the shafts 16 and 16a beyond the ends of the spacer sleeves 50 and 50a. The center of the wire is supported by a hook which is firmly secured to a fixed member which may for example be a ceiling beam. The wire is preferably thin and not readily visible. Thus when the device is hung, the display rotates and appears to be hovering in the air.

The invention has been described having a cylindrical tube closed at its ends. The invention does not require a cylindrical housing, any type of housing may be used, for example it may be a model of a product, or an enlarged box in which a particular product is packaged.

Thus, there has been shown and described a rotating advertising device, which is compact and has a self contained power supply and drive mechanism. The support bracket of the device performs the dual function of mounting the display, and serving as an electrical conductor to close the circuit to the motor. The shaft on which the display rotates forms part of the electric circuit, and with the invention a switch as such is not required.

Although only two embodiments of the invention have been illustrated and described, various changes in the form and relative arrangements of the parts, which will now appear to those skilled in the art may be made without departing from the scope of the invention. Reference is, therefore, to be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A device comprising a frame; an electric motor mounted on said frame; said motor having a pair of electrical inputs and a mechanical output shaft; said motor adapted to rotate its output shaft when energized by an electric potential being impressed across its inputs; a battery mounted on said frame; said battery having a first electric terminal, and a second electric terminal, and providing therebetween a potential sufficient to energize the motor; said first electric terminal being connected to one of the motor inputs; a housing surrounding said battery, motor and frame; said housing being mechanically connected to the output shaft of the motor, and adapted to be rotated by said output shaft; a shaft co-axial with said axis of rotation of said housing, mounted on the frame and extending from opposite ends of said housing, the ends of said shaft being electrically insulated from each other; one of said ends being electrically connected to the second terminal of the battery, and the other of said ends being connected to the other of the motor inputs; and support-and-conducting means connected to the ends of said shaft for mechanically supporting said shaft and also providing an electrical contact therebetween to close the electrical path between the second terminal of the battery and the other input of the motor.

2. A device according to claim 1 wherein said shaft comprises two parts each securely mounted to the frame, co-axial with the axis of rotation of the housing and extending from opposite sides of the housing; one of said

shafts being electrically insulated from said frame, and the other shaft being in electrical contact with said frame; said frame being of an electrically conducting material and forming part of the electrical path between the second terminal of the battery and the other input of the motor.

3. A device according to claim 2 wherein the connection between said first electric terminal of the battery and said one of the motor inputs comprises a contact support firmly mounted to the frame, a contact cup held on said support and insulated therefrom; said support being of resilient material for pressing said cup against said first battery terminal so as to maintain a firm contact therewith; an electric conductor connecting said contact cup to said one motor input.

4. A device according to claim 1 comprising a pair of tubular spacer sleeves, each sleeve surrounding and co-axial with an end of the shaft and positioned between the ends of the housing and the support-and-conducting-means for maintaining said means a predetermined distance from said ends.

5. A device according to claim 1 wherein said support-and-conducting-means comprises a wire.

6. A device according to claim 1 wherein said support-and-conducting-means comprises a frame having a first portion pivotably supporting one end of the shaft, a second portion pivotably supporting the other end of the shaft, a third portion joining said first and second portions together, and clamp means connected to said third portion.

7. A device according to claim 6 for use on a grocery shelf having a track with two lips thereon, said clamp means comprising a resilient member adapted to snap into said track and be retained therein by said lips engaging said member.

8. A device according to claim 1 wherein said mechanical connection between said motor output and said housing comprises a gear train.

9. A device according to claim 1 wherein said mechanical connection between the motor and the housing comprises a gear rigidly connected to an end of said housing, said gear being co-axial with said axis of rotation of the housing; and a second gear driven by said motor engaging said gear on the housing.

10. A device according to claim 1 wherein said housing comprises a cylinder co-axial with the axis of rotation; and two end portions which are connectable to said cylinder.

11. A device for use with a battery having a first and a second terminal comprising a frame; an electric motor mounted on said frame; said motor having a pair of electrical inputs, and a mechanical output shaft; said motor adapted to rotate its output shaft when the battery terminals are connected to the inputs; said frame adapted to support said battery; conducting means connected to one of said motor inputs and adapted to contact the first terminal of the battery when supported on said frame; a housing surrounding said frame and motor; said housing being mechanically connected to the output shaft of the motor, and adapted to be rotated by said output shaft; a shaft mounted on the frame co-axial with the axis of rotation of the housing and extending from opposite ends of the housing; the ends of said shaft being electrically insulated from each other; one of said ends being connected to the other motor input, and the other end adapted to be connected to the second terminal of the battery when supported on the frame.

12. A device according to claim 11 wherein said shaft comprises two parts each securely mounted to the frame co-axial with the axis of rotation of the housing and extending from opposite sides of the housing; one of said shafts being electrically insulated from said frame, and the other shaft being in electrical contact with said frame; said frame being of an electrically conducting material and forming part of the electrical path between the second terminal of the battery and the other input of the motor.

13. A device according to claim 10 comprising at least one clip mounted on said frame for securing said battery.

14. A device according to claim 10 wherein said conducting means comprises a contact support firmly mounted to the frame, a contact cup held on said support and insulated therefrom; said support being of resilient material for pressing said cup against said first battery terminal so as to maintain a firm contact therewith; an electric conductor connecting said contact cup to said one motor input.

15. A device according to claim 14 wherein said other end of the shaft is adapted to be connected to said second battery terminal by a contact support firmly mounted to the frame, a contact cup held on said support and insulated therefrom; said support being of resilient material for pressing said cup against said second battery terminal so as to maintain a firm contact therewith; an electric conductor connecting said contact cup to said other end of the shaft.

16. A display device for use with a two terminal electric battery, comprising an electric motor having a pair of electric input terminals, and a mechanical output shaft; said motor adapted to rotate its output shaft when energized by an electric potential applied across its input by the battery; a frame mounting said motor, and also adapted to support the battery with a first terminal of the battery in electrical contact with a first terminal of the motor; a housing surrounding said frame; said housing being disposed about an axis of rotation; and said housing being mechanically connected to the output of the motor, and adapted to be rotated by said output shaft, a shaft co-axial with said axis of rotation extending from opposite ends of the housing, the ends of said shaft being electrically insulated from each other; one of said ends being electrically connected to a second terminal of the motor, and the other of said ends adapted to be electrically connected to a second terminal of the battery when said battery is secured to the frame.

17. A display according to claim 11 wherein said mechanical connection between said motor output shaft and said housing comprises a gear train terminating in a pinion, a second gear co-axial with said axis of rotation rigidly connected to the housing and engaging said pinion.

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