Feb. 1, 1966 J. ANTHONY 3,231,995

MOBILE DISPLAY DEVICE

Filed Aug. 21, 1964

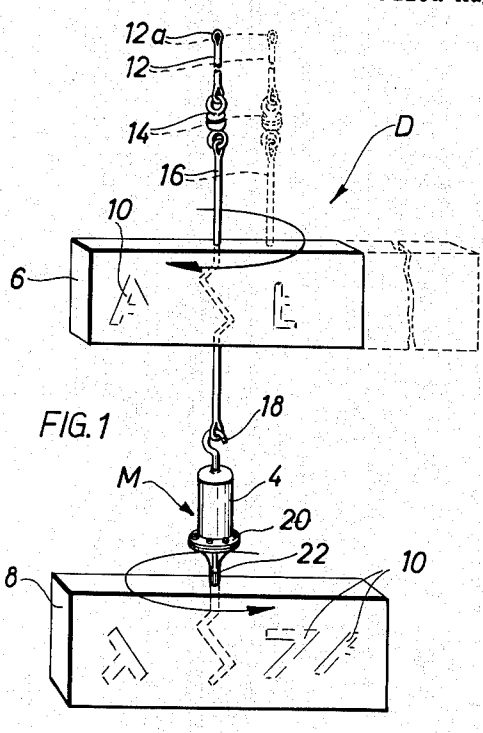


FIG. 1

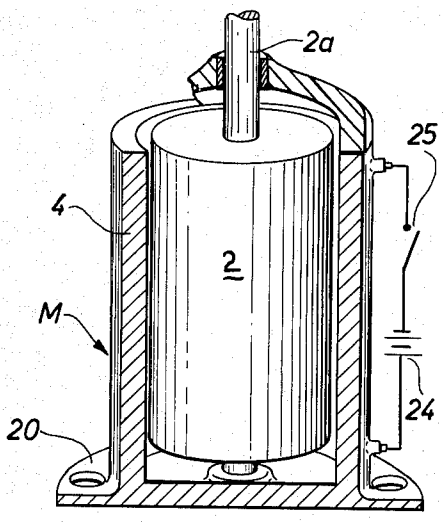


FIG. 2

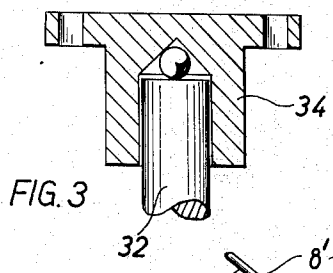


FIG. 3

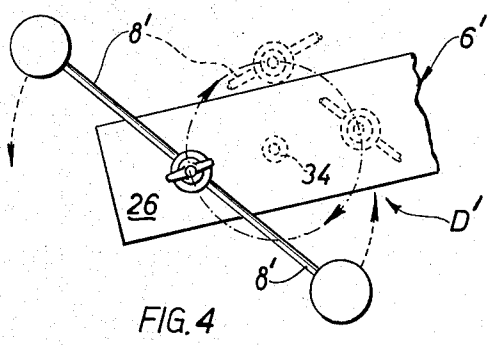


FIG. 4

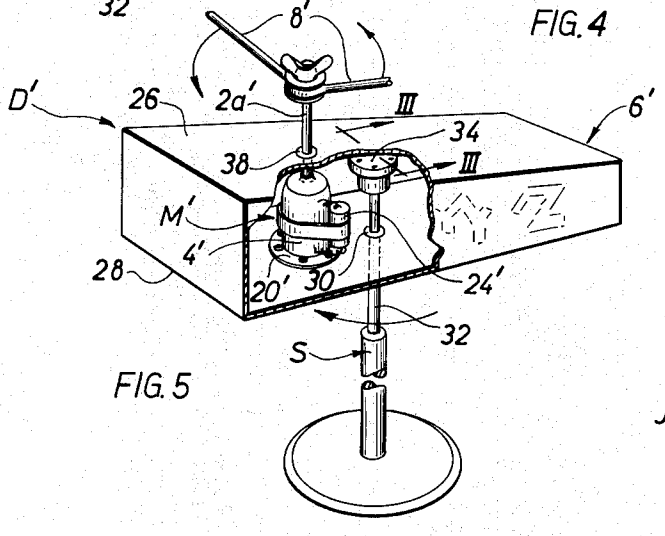


FIG. 5

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MOBILE DISPLAY DEVICE

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The invention relates to display devices particularly of the animated or moving type as used for example in advertising at the point of sale.

The display device of particular interest to the invention embodies a pair of display members such as signs or the like which are apparently coupled together and yet move in different directions. Moreover, the invention also contemplates that the said display members and the structure motivating them are all combined in a single self-contained unit which is seemingly unconnected to any source of power.

Similar devices embodying one or more display elements moving in the same direction are believed to be well known and the invention differs from the prior art primarily in that it is provided with at least two members moving in different directions.

The invention seeks to take advantage of the phenomenon of reaction which is inherent in every prime mover. For example, a conventional electric motor may comprise a frame mounting field coils and supporting an armature which rotates within the embrace of said field coils. Usually, the frame is stationary and it is only the armature which rotates. However, it will be quite apparent that if the frame were itself also rotatably supported, it would, upon energisation, move in a direction opposite to that of the armature and in reaction thereto.

Accordingly, it is a main object of the invention to provide a display device having at least two mobile display members which can be set in motion in different directions by the respective reaction elements of a motor, and it is a related object to provide such a display device wherein said motor is self-contained.

It is a further object of the invention to provide a display device as aforesaid supported by a suspension or a standard for operation as aforesaid.

It is a further object of the invention to provide a display device as aforesaid wherein said display members are rotatable in opposite directions.

It is a further object of the invention to provide a display device as aforesaid wherein said device is connected to the supporting structure by means permitting rotation of said display members in opposite directions independently of said structure.

It is a further object of the invention to provide a display device as aforesaid wherein said mobile display members move cyclically about different centres.

It is a further object of the invention to provide a display device as aforesaid wherein one of said display members performs both rotary and orbital movements.

It is a still further object of the invention to provide a display device wherein said motor is electrically operable and its source of power is assembled therewith to provide a self-contained and self-energisable motor assembly.

The above and other objects are achieved in accordance with the invention by the provision in a display device of a pair of reaction elements energisable to move in different directions, said reaction elements being included in a self-contained, self-energisable motor assembly. Mobile display members are respectively connected to said reaction elements and mounting means is provided enabling one of said reaction elements to move in relation to an external support while itself supporting the other reaction element for movement relative thereto so

that when said reaction elements are energised they impel their respective display members to move in opposite directions.

Preferably the reaction elements generate torque which causes rotation of the display members and a swivel or other pivot is interposed between one of the reaction elements and an external support therefor.

The invention will now be described by way of illustration with reference to the accompanying drawings wherein like reference letters and numerals denote like parts and wherein:

FIG. 1 is a perspective view of a display device in accordance with the invention;

FIG. 2 is a schematic representation of a motor assembly as contemplated by the invention;

FIG. 3 is a section on the line III—III of FIG. 5;

FIG. 4 is a fragmentary top plan view of another form of display device in accordance with the invention;

FIG. 5 is a perspective view of the device of FIG. 4 partly broken away to reveal otherwise hidden internal detail, and for the sake of simplicity.

A display device D in accordance with the invention is shown in FIG. 1.

The power unit for the device D is a motor M, a schematic representation of which on an enlarged scale is shown in FIG. 2. The motor M comprises reaction elements **2** and **4** which are respectively equivalent to an armature and a field as previously discussed.

In the present specific embodiment the reaction element **4** includes the frame of the motor M carrying the usual field coils and other motor parts in relation to which the armature rotates and for simplicity all said parts will be compendiously designated herein by the term "frame." Although the terms "armature" and "frame" are used herein to denote the reaction elements **2** and **4** it should be understood that such use is exemplary and for convenience only in referring to said reaction elements and should not be construed or deemed to exclude other comparable devices.

Following conventional practice the armature **2** and frame **4** are coupled together for relative rotational movement but are restrained against relative axial movement, and in this sense said reaction elements, may be described as being mutually supportable since when one is supported externally it in its turn supports the other. Obviously if when the motor M is energised one of the reaction elements **2–4** is restrained against rotation the other will rotate relative thereto.

In accordance with the invention, however, the motor M is carried by an external support in such a way that the armature **2** and frame **4** are capable of simultaneous rotation in opposite directions relative to each other and to said external support and this may be achieved, for example, by connecting one of said reaction elements **2–4** to said external support through a swivel or other pivotal connection whereby it is free to move rotatably relative to said external support while supporting the other reaction element for rotation relative thereto.

The armature **2** is connected to a display member **6** and the frame **4** is connected to a display member **8** so that when the motor M is energised as aforesaid the torques developed by the elements **2** and **4** in reaction to each other are respectively transmitted to said display members causing them to rotate in opposite directions as suggested by the arrows in FIG. 1.

The display members **6** and **8** may be in the form of signs and it will be understood that in this case the members **6** and **8** will carry advertising matter such as **10** on their outer faces. Since in accordance with the invention each side of each sign is at some time visible to an onlooker in any angular position relative to the display

device D each of the signs **6** and **8** may advantageously carry different advertising matter on its respective sides.

A most important characteristic, however, of the device D lies in its enhanced attention catching capacity arising from the fact that the signs **6** and **8** rotate in opposite directions and the impact of the display may, of course, be heightened by concealing the motor M, inside one of the signs for instance, whereby the signs would appear to revolve in opposite directions of their own volition.

Obviously signs such as **6** and **8** illustrated in FIG. 1 are examples only of display members to which the invention may be applied and many other types of display members suitable for use with the apparatus of the invention will suggest themselves to a person skilled in the display art.

Turning now to a more detailed consideration of the structure illustrated in FIGS. 1 and 2 it will be seen that the whole device D is intended to be suspended from an elevated point by means of a strand **12** looped at **12***a* for engagement with a hook or the like (not shown). The strand **12**, which may be of flexible cord, carries at its lower end a conventional barrel swivel **14** which in turn is connected to a hanger **16** embedded in and projecting above the display member **6**.

The hanger **16**, which may be either flexible or rigid, also projects below the display member **6** where it may be looped for engagement with a hook **18** carried by the motor M at its upper end.

The motor M also carries at its lower end a flange **20** with which a hanger **22** embedded in the display member **8** is engaged, the hanger **22** being similar to the hanger **16** although in this case it does not project below the display member.

The hook **18** is mounted on the armature **2** of the motor M and may form an extension of the armature shaft **2***a*, while the flange **20** is secured to the frame **4**.

It will be clear that the display member **6** and the armature **2** are enabled to rotate independently of the strand **12** and the structure to which the loop **12***a* is attached by means of the swivel **14**.

The motor M may be powered by a dry cell battery **24**, a switch **25** being incorporated in the circuit linking it to the motor. It is contemplated that the battery **24** be either enclosed within the frame **4** or attached to the outside thereof whereby the motor M and battery **24** together constitute a self-contained, self-energisable motor assembly.

The hangers **16** and **22** are advantageously flexible whereby the initial torques generated by the reaction elements **2–4** upon energisation of the motor M are absorbed in twisting said hangers rather than transmitted directly to the display members **6–8** which, being of relatively great area, have considerable inertia owing to air resistance. In this way the twisting of the hangers **16** and **22** provides increased torque to overcome the inertia of the display members **6–8** and a motor M of correspondingly lower output may be employed, the torque required to keep the display members in motion being relatively small. This well-known device for augmenting the torque of low-output motors does not, of course, form a part of the present inventive idea.

The embodiment illustrated in FIG. 1 is comparatively simple in that the display members **6–8** rotate about aligned axes. However, to produce an alternative visual effect the members **6–8** may be arranged to move cyclically about different centres. They may, for instance, rotate about parallel, offset axes as indicated in broken lines in FIG. 1. It will be understood that in this case the member **8** describes not only rotary movement about its own axis but also an orbital movement about the rotational axis of the member **6**. It will also be appreciated that the display members **6–8** do not necessarily rotate at the same speeds as each other, said speeds being governed by such factors as the ratio of the display members' respective areas.

A modified form of the invention is illustrated in FIGS. 3 to 5 which show a display device D' supportable on a standard S.

The device D' includes display members **6'** and **8'** and a motor M'. As shown in FIG. 5 the display member **6'** is of a hollow, box-like construction and includes upper and lower walls **26** and **28** respectively. The lower wall **28** has a bushed aperture **30** providing a bearing for a rod-like portion **32** of the standard S, the upper end of said standard portion **32** being engaged in a bearing **34** mounted on the upper wall **26** whereby the display member **6'** is rotatably mounted on the standard S. The bearing **34** is shown in section on an enlarged scale in FIG. 3.

The motor M' may be basically similar to the motor M and includes a flange **20'** by which its frame **4'** is attached to the lower wall **28** inside the display member **6'**. The armature shaft **2***a'* of the motor M' extends through a bushed aperture **38** in the upper wall **26** and outside the display member **6'** is connected to the display member **8'** which may comprise a pair of spheres yoked by rigid rods as shown in FIG. 4.

A dry cell battery **24'** is shown attached externally to the motor M' and it will be noted that in this embodiment the motor assembly is normally concealed within the display member **6'** thus heightening the "mysterious" appearance of the display.

In the FIG. 5 embodiment, as in the broken line representation of FIG. 1, the display members **6'–8'** rotate about parallel, offset axes in opposite directions when the motor M' is energised, and the display member **8'**, in addition to rotary movement about its own axis, executes an orbital movement about the rotational axis of the member **6'**, said rotational and orbital paths of the member **8'** being indicated respectively in broken and chain dotted lines in FIG. 4 wherein the proportions of some of the parts of the device D' have been distorted somewhat for the sake of clear presentation.

In summary the invention may be said to reside in the provision of a self-contained, self-energisable motor assembly including a pair of reaction elements mounted for free movement in different directions in reaction to each other when energised, said reaction elements being connected to mobile display members whereby said display members are rendered co-movable with said reaction elements in said different directions.

Whereas two preferred embodiments of the invention have been described herein solely for illustrative purposes, it will be understood that many modifications may be made in the specific structures detailed herein without thereby departing from the scope of the invention as defined in the claims now following.

What I claim is:

1. A display device comprising:

a pair of mobile display members interconnected for simultaneous movement relative to each other upon a fixed support;

a self-contained, self-energisable motor assembly;

a pair of reaction elements included in said motor assembly each said reaction element being movable simultaneously with and relative to the other and in a direction opposite thereto when the motor assembly is energised, said mobile display members being respectively connected to said reaction elements for movement therewith in said opposite directions, and

means for mounting said mobile display members and motor assembly on said fixed support permitting said display members to be moved simultaneously relative thereto and to each other by said reaction elements.

2. A display device as claimed in claim **1** wherein:

said reaction elements rotate relative to each other when energised;

the rotation of each said element being transmitted to the display member connected thereto to simultane-

eously rotate said display member in a direction opposite to that in which the other display member is being rotated by the other element.

3. A display device as claimed in claim 1 wherein:

said mounting means includes means for suspending said display members and said motor assembly to swivel upon said fixed support.

4. A display device as claimed in claim 1 wherein:

said mounting means includes means for pivotally mounting said display members and said motor assembly on a standard.

5. A mobile display device as claimed in claim 1 wherein:

said mounting means includes a swivel interposed between said support and said motor assembly permitting both said reaction elements to rotate relative to said fixed support.

6. A display device as claimed in claim 1 wherein:

said motor assembly includes an electric motor and a battery supplying power thereto, and

said reaction elements comprise the armature and the frame of said electric motor.

7. A display device as claimed in claim 1 wherein:

said mobile display members are rotatable by said reaction elements about aligned axes.

8. A display device as claimed in claim 1 wherein:

said mobile display members are respectively rotatable by said reaction elements about parallel, mutually offset axes.

9. A display device as claimed in claim 1 wherein:

said mobile display members are respectively rotatable by said reaction elements about parallel, mutually offset axes;

one of said display members being also capable of simultaneous orbital movement around the axis of said other display member.

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