Oct. 27, 1953 E. F. McDONALD, JR 2,656,630

ADVERTISING DEVICE

Filed May 20, 1950

Fig. 1

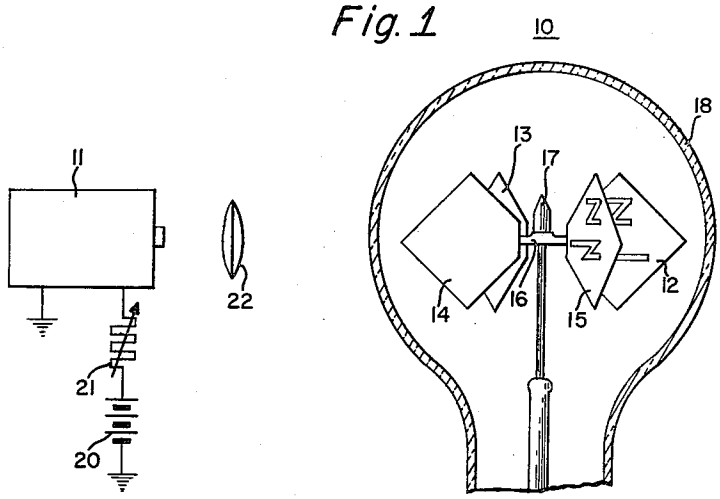
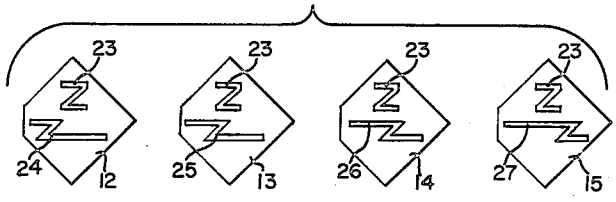


Fig. 2



EUGENE F. McDONALD JR.
INVENTOR.

BY Francis W. Crosby

HIS ATTORNEY

Patented Oct. 27, 1953 2,656,630

UNITED STATES PATENT OFFICE

2,656,630

ADVERTISING DEVICE

Eugene F. McDonald, Jr., Chicago, Ill.

Application May 20, 1950, Serial No. 163,287

2 Claims. (Cl. 40—125)

1

This invention relates to novelty advertising devices.

It is known in the art that if a plurality of vanes, each having a radiant-energy absorbing face and a radiant-energy reflecting face opposite the absorbing face, are similarly supported for rotation in a rarefied atmosphere about a common axis, incidence of radiant energy upon the absorbing faces of the vanes causes the system to rotate about the axis. Such devices are known in the art as radiometers and have found application in the measurement of the intensity of the radiant energy of rarefied gases and in other scientific measurements. However, until the present time, radiometers have been regarded as scientific instruments or, to the layman, as a sort of curiosity, since there is no readily apparent reason for the rotation of the vanes.

Because a radiometer has the appearance of a perpetual motion machine to one not endowed with an understanding of the manner in which it operates, a display centering about a radiometer seldom fails to attract the attention of large numbers of passersby. Indeed, radiometers are often displayed as objects of curiosity in jewelers' windows, for no useful purpose other than to attract the attention of window shoppers to the other items included in the display. Thus, some of the advertising potentialities of the radiometer have been recognized. However, while radiometers have been employed in the role of an attention-getter to attract the public eye, full use has not been made of the fact that it is the radiometer to which the attention is primarily directed and not the surrounding merchandise.

It is a primary object of the present invention to provide a new and useful device for display advertising purposes or the like. It is a further object of the invention to provide a new and improved advertising device in which the full advertising potentialities of a radiometer are utilized.

In accordance with the invention, a novel device of the class described comprises a radiometer including a plurality of vanes, each having a radiant-energy reflecting surface and a radiant-energy absorbing surface opposite the reflecting surface. The vanes are similarly supported in a rarefied atmosphere for rotation about a common axis in response to incidence of radiant energy upon the vanes. Indicia of luminescent material are inscribed on the vanes to provide the effect of a continuous image in response to rotation of the vanes about the common axis, the luminescent material being of substantially the same color as the vane surfaces on which it is deposited in order not to detract from the efficiency of the radiometer.

The features of the present invention which

2

are believed to be novel are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood, however, by reference to the following description taken in connection with the accompanying drawing, in the several figures of which like reference numerals indicate like elements, and in which:

Figure 1 is a composite view, partly schematic and partly in fragmentary cross section, of an advertising display device constructed in accordance with the invention, and

Figure 2 is a composite detail view of a portion of the apparatus of Figure 1.

As shown in Figure 1 a display advertising device constructed in accordance with the present invention comprises a radiometer 10 and a source 11 of radiant energy. Radiometer 10 is of a type generally well-known in the art and comprises a plurality of vanes 12, 13, 14 and 15 supported by means of a frame 16 which is pivoted by means of a bearing 17 for rotation about a common axis. The entire system is supported within a glass envelope 18 which is partially evacuated to provide a rarefied atmosphere. Each of the vanes 12, 13, 14, and 15 is provided with a radiant-energy absorbing surface and a radiant-energy reflecting surface opposite the absorbing surface. For example, each of the vanes may comprise a thin sheet of mica or the like which is blackened on one side and polished on the other. The vanes 12, 13, 14 and 15 are similarly supported on frame 16; in other words, the blackened or radiant-energy absorbing surfaces of all vanes face in the same direction around the common axis. Envelope 18 is not fully evacuated but instead is evacuated to such an extent that the mean free path of the residual gas molecules is comparable with the transverse dimensions of each vane.

As is well-known in the art, when radiant energy impinges upon the blackened or absorbing surfaces of the vanes 12, 13, 14 and 15, the absorbing surfaces rise to a higher temperature than the reflecting surfaces. Consequently, residual gas molecules colliding with the blackened surfaces acquire greater rebound velocities than those impinging on the bright surfaces. Thus the reactionary force produced by the rebounding gas molecules is greater on the absorbing surface of each vane than on the reflecting surface, and a net torque is developed which causes the entire system to rotate in a direction away from the absorbing surfaces. For instance, if the front surface of vane 12 as shown in Figure 1 is the absorbing surface, the system rotates in a counterclockwise direction as viewed from above.

The radiant energy which may be used to drive the radiometer 10 may advantageously comprise a source of concentrated light or heat. For ex-

ample, source 11 may constitute an ultraviolet-ray lamp energized by a suitable power source here shown as a battery 20. Moreover, means such as a variable resistor 21 may be provided for controlling the intensity of the radiant energy emitted by source 11. In some applications, it may be desirable to provide collimating or focussing systems for the radiant energy. Such systems are well known in the art and are here indicated schematically as a single lens 22.

In accordance with the present invention, the several vanes of the rotating system of the radiometer 10 are inscribed with similar indicia 23, here shown as a letter Z for purposes of illustration, preferably representing a trade-mark, trade name, or other advertising message to be imparted to the public. Indicia 23 are inscribed in corresponding positions on vanes 12, 13, 14 and 15, as best shown in Figure 2. As a consequence, when the vanes rotate about the common axis due to the incidence of radiant energy, the appearance of a stationary image is achieved due to the persistence of vision as the vanes successively rotate through the field of view of the observer.

In accordance with another feature of the invention, other indicia 24, 25, 26, and 27, of generally similar configuration, are also inscribed on vanes 12, 13, 14, and 15, respectively, in progressively different positions thereon. Consequently, when the system rotates, the appearance of a moving image is achieved due to the progressive displacement of the successive indicia. For purposes of illustration, indicia 24, 25, 26, and 27 have been shown in suitable form to provide the effect of a moving lightning flash, although the moving image may represent any desired animation.

The speed of rotation of the vanes about the common axis is dependent upon the intensity of the incidence of radiant energy. A convenient control over the speed of rotation, and hence over the speed of the moving virtual image, is provided by resistor 21. However, it is also contemplated that the system may be operated with a radiant energy source of suitable constant intensity. Moreover, in some applications, no discrete radiant energy source 11 may be required, the radiant energy of the sun's rays being sufficient to impart the desired motion to the vane system. Furthermore, if the vanes should be found to rotate too rapidly, envelope 18 of radiometer 10 may be constructed of a filter glass or may be coated with a material having the desired radiant-energy transmission properties to reduce the rotation speed to the desired value.

The indicia may be inscribed on the several vanes in any of a number of ways. For example, paint of a color contrasting with that of the vane surface may be used. Moreover, paints of different colors may be used on the several vanes to provide unique color effects. Alternatively, the indicia may be inscribed on the vanes by removing material therefrom in accordance with the desired design, as by punching out or the like.

Since the operation of the radiometer is dependent upon the reactionary forces developed by rebounding gas molecules, and since the maximum speed which may be attained is determined by the temperature differential between the two surfaces of each vane, the provision of indicia of contrasting color or the removal of vane material to provide the virtual image may detract from the efficiency and maximum speed of the system.

In accordance with another feature of the invention, the desired effect may be provided without materially reducing the maximum attainable speed by inscribing the indicia with luminescent material of substantially the same color as the surface on which it is deposited. For example, phosphors of the type used for cathode-ray tube luminescent screens may be employed. When the indicia are so inscribed on the vanes, the collimated energy from source 11 may be in the form of a light wave of a wavelength suitable for activating the luminescent indicia; at the same time, the energy from source 11 induces the temperature differential between the opposite surfaces of the vanes which is required to cause the vane system to rotate. Unique color effects may be obtained by using phosphors of different glow characteristics on the several vanes.

Thus, the present invention provides a novel display advertising device which utilizes a radiometer to attract the attention of the public and in which the advertising message is carried by the radiometer itself where the observer's attention is naturally focussed.

While particular embodiments of the present invention have been shown and described, it is apparent that various changes and modifications may be made, and it is therefore contemplated in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. In an article of the class described: a radiometer comprising a plurality of vanes, each having a radiant-energy reflecting surface and a radiant-energy-absorbing surface opposite said reflecting surface, similarly supported in a rarefied atmosphere for rotation about a common axis in response to incidence of radiant energy upon said vanes; and indicia of luminescent material inscribed on said vanes to provide the effect of a continuous image in response to rotation of said vanes about said axis, said luminescent material being of substantially the same color as the vane surfaces on which it is deposited.

2. In an article of the class described: a radiometer comprising a plurality of vanes, each having a radiant-energy reflecting surface and a radiant-energy absorbing surface opposite said reflecting surface, similarly supported in a rarefied atmosphere for rotation about a common axis in response to incidence of radiant energy upon said vanes; indicia of luminescent material inscribed on said vanes to provide the effect of a continuous image in response to rotation of said vanes about said axis, said luminescent material being of substantially the same color as the vane surfaces on which it is deposited; a source of radiant energy; means for directing radiant energy from said source upon said vanes to cause simultaneously rotation of said vanes about said axis and luminescence of said indicia; said radiant energy source being readily adjustable to vary the speed of said vane rotation and the intensity of said luminescence.

EUGENE F. McDONALD, JR.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,507,137	Juhl	Sept. 2, 1924
1,945,789	Revis	Feb. 6, 1934
2,391,705	Isenberg	Dec. 25, 1945