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(54) **Advertising display board with interchangeable images.**

(57) A display board adapted for publicity use and the like, having the capacity for interchanging, in a continuous cycle, six or more display faces (F) composed of modular strips (1) movable along annular circulation paths (4) by means of motor-driven mechanisms (13, 22, 23)

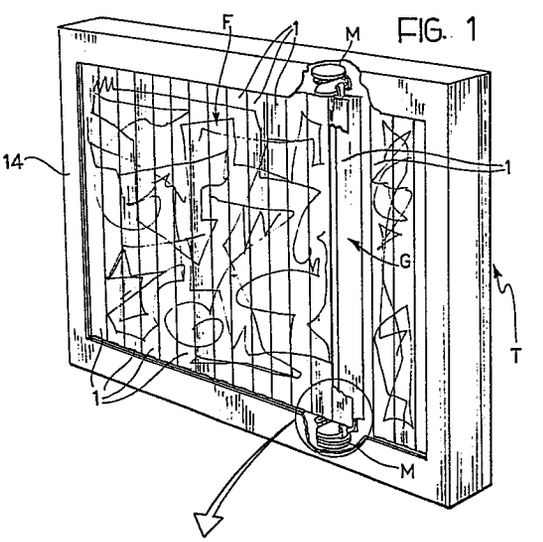

FIG. 1

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Description

Advertising display board with interchangeable images

The present invention relates in general to display boards adapted for the presentation of interchangeable advertising images and constituted by movable strips which can be combined and interchanged by means of motor-driven systems to form various planar images.

Advertising boards with movable display faces are known to exist and are used in very visible public places, such as squares, much-frequented streets, as well as in venues selected for important events (sporting or otherwise) which, due to the fact that they may be broadcast on television, reach a much larger public than is physically present. The multiplicity of images which can be presented on such display boards has the double function of, on the one hand, rationalising the use of the advertising spaces available, since it is possible to display more than a single advertising message on each space acquired, and, on the other hand, of making the recall of the advertisement itself more effective, it being recognised that a moving image has a greater effect in capturing the visual attention than a fixed image.

One existing type of mechanical display board normally interchanges two or three display faces, these being divided into strips arranged horizontally or vertically so as to rotate about longitudinal axes. Here one is concerned with flat band strips in the case of display boards with two display faces, and with prisms with equilateral-triangular sections in the case of display boards with three faces. Other types of display boards, whose image-interchange is much less pleasing from an aesthetic point of view, involve the rolling of webs tensioned between motor-driven rollers. Yet others are constructed with the use of mechanisms which move strips composed of articulated belt elements. These techniques, however, enable at most four or five images to be changed in a continuous cycle, if one excludes opto-electronic boards which, whilst offering greater possibilities as regards kinematic effects, are less visible in full daylight, are much more expensive to construct and operate and have limitations as regards graphics and the colouring of images.

The present invention proposes an original and innovative mechanical solution in the specific technology of the construction of display boards with motor-driven interchangeable strips.

This solution, defined in Claims 1 to 9, enables six or more different images to be interchanged on the display face of a display board and enables the interruptions in continuity of the images (spaces between the strips) to be reduced until they are almost eliminated. With suitable auxiliary devices, it also enables the time for which each image is displayed to be regulated at will or enables the images to be interchanged by movement of the display strips either simultaneously or in a programmable sequence to obtain special effects.

For an understanding of the particular technique of the invention, reference is made to the appended drawings, which are exemplary and non-limiting in character, and which are referred to in the following detailed description. They show:

in Figure 1, a perspective view of a display board cut away to show its internal mechanisms;

in Figure 2, a detail of one of the modular mechanisms for moving the strips, on an enlarged scale;

in Figure 3 a schematic plan view of Figure 2 from above;

in Figure 4 a partial section taken in the plane VI-VI of Figure 3;

in Figure 5 a side-elevational view taken on the arrow V of Figure 4.

As can be seen, the vertical strips 1 which make up the display face T of the display board and which are made of a light, rigid material, are mounted on movable carriages 2 in modular mechanical units. Each pair of strips located side by side and visible on the display face represents a double image element amd forms part of a module G which, in addition to the strips which are visible, also carries a series of other strips 1 grouped behind the display face F (three, four or more) which are subsequently substituted in succession for the visible strips. Each module G is constituted by two identical mechanical units M positioned one at the bottom and one at the top of the display board strips 1. Each mechanical unit M includes a plate 3 of rounded shape which carries an annular track 4 on its upper surface, around its outer edge. This track 4, which is preferably raised above the surface of the plate (so that it is more easily kept free of dirt), guides the movement of the series of carriages 2 each provided with a pair of pivoted wheels 5 located one after another on the track itself. The carriages 2, of which there are six or more according to the length of the track 4, are aligned along a section thereof, in close contact with each other but without being mutually interengaged. Each carriage 2 is characterised by being generally "C"-shaped, with an upper part 2-s which holds the pivoted wheels 5 and is thus above the track 4; the middle part 2-m descends outside the edge of the plate carrying the track and the lower part 2-i extends beneath the plane of the plate itself. The lower part 2-i has a threaded pin 6, which is tightened until its point touches the lower surface of the plate 3, to prevent the carriage 2 from moving. The function of these carriages 2 is to support the ends of the movable strips 1 of the display board and there are therefore two of them for each vertical strip (one at the bottom and one at the top). It follows that the attachments for the strips, which are constituted by simple channel-profiles 7, are fixed to the upper parts of the carriages located at the bottom of the display board T, and to the lower parts of the carriages located at the top (carriage suspensions). The movement of the carriages 2 along the track 4 in each modular unit M is driven by a rotary disc 8 provided with a pivoting arm 9 provided for engage-

ment with an entrainment pin 10 provided on each carriage 2. The arm 9 is housed in an aperture 20 formed in the rotary disc 8 and pivots about a radial axis 21 in the disc itself. The disc 8 is situated in a plane parallel to the plate 3 which guides the carriages and faces a fixed disc 11 on which there is formed a raised part in the shape of a sector of a circular ring 12. The relative positioning of the rotary disc 8, the fixed disc 11 and the semi-annular raised part 12 is such that, during rotation of the rotary disc 8, the pivoted arm 9 is tipped from a raised state in which it is engaged with the pins 10 of the carriages to an inoperative, lowered state, and vice versa. The rotary disc 8 can be driven in different ways in dependence on the specific requirements for each display board to be constructed; it can in fact be operated by a single electric motor 13 through direct gearing 22 meshed with peripheral teeth 23 of the rotary disc 8, or by a chain or a belt; or drive may be derived from a transmission member connected to several modules M (chain, worm screw, etc.).

Starting from the condition illustrated in Figure 3, with the positions of the carriages 2 established by small reference notches (not illustrated) formed in the guide track 4 under the wheels 5 of the first carriage 2-A and of the last carriage 2-Z, which prevent their accidental advance, the mechanism operates in the following manner:
the rotary disc 8, starting from rest, with the arm 9 in the lowered rest position, rotates and completes a half-turn, approximately 180°, without engaging any carriage 2; the arm 9 then comes into contact with the semi-annular raised part 12 of the fixed disc 11 and tips about its own axis 21 through 90° into the raised position until it engages the entrainment pin 10 of the first carriage 2-A; it then releases it from its position and pushes it along the front half of the track 4 until it is brought into contact with the last carriage 2-Z of the series which is stationary on the track 4. The thrust continues, setting the whole train of runners in motion until the first carriage 2-A has assumed the position which was previously occupied by the last carriage 2-Z. At this point the second carriage 2-B will also have reached the position previously occupied by the first carriage 2-A and two different faces of the strips 1 of the display board T moved thereby will be presented. This position also corresponds to the gap in the raised part 12 which had been holding the arm 9 in the tipped position, and the arm returns to the lowered position (possibly biassed by an auxiliary spring, not illustrated) and is released from the entrainment pin 10 of the first carriage 2-A. Here the rotation of the motor-driven disc 8 can be stopped (for example by means of a microswitch, not illustrated) for a time interval (the time for which the images are presented on the display board) programmed by a timer (also not illustrated). When it is restarted, the phases of movement described above will be repeated exactly and may proceed in a continuous cycle. The synchronising of the gearing of the mechanical units M situated at the bottom and at the top of each individual module G ensures the regularity of movement of the strips 1 of the display board T, to both surfaces of which portions of the whole image are obviously applied, for example by gluing.

The display board T may be composed of an indefinite number of modules G, particularly if each of them is driven individually. With suitable transmission members, however, a single motor can, as stated, drive a group of modules G or all the modules C of the display board T.

The individual driving of each module or of small groups of modules G enables, inter alia, the piloting of the motors to be programmed with the aid of a microprocessor, in a manner within the capability of an expert in the art, so as to interchange the images in variable sequences (all the modules simultaneously, in waves, in sections, etc.).

All the mechanical units described above are fixed to a support frame 14 which frames the display board T and can be housed in a protective casing. The display face F can be suitably protected from atmospheric agents by a transparent sheet.

It can be seen that it is possible, by increasing the length of the track 4, to produce mechanical modules G which are able to accommodate as many as seven or eight or even more carriages 2 for supporting the strips 1 of the display board T, with a consequent increase in the number of images which can be presented by the display board. In fact this is limited technically solely by the friction which comes into play in dependence on the height and hence the weight of the strips 1 of the display board.

Finally, it should be mentioned that, with suitable structural variants, which are nevertheless derived from the same structural concept as that described, it is possible to produce display boards with horizontal strips, having the same operative characteristics.

Claims

1. An advertising display board with interchangeable images defined by movable strips which can be combined and interchanged by motor-driven control means to form different planar images in succession, characterised in that it comprises a plurality of contiguous modular mechanical units (G), each of which defines an annular circulation path (4) along which a plurality of the strips (1) is movable by the drive means (13, 22, 23) for successive positioning in pairs located side by side in the plane of the planar image (F), the other strips being kept in the zone of the circulation path (4) behind the plane of the planar image (F).

2. A display board according to Claim 1, characterised in that there are more than three strips (1) and there are preferably six strips.

3. A display board according to Claim 1 or Claim 2, characterised in that each modular unit (G) includes two annular guides (4) situated at opposite ends of the strips (1), and in that each strip (1) is provided with a pair of end carriages (2) which are movable along the two guides (4).

4. A display board according to Claim 3,

characterised in that a rotary disc (8) is operatively associated with each of the annular guides (4) and is operated by the motor-driven control means (13, 22, 23) and carries cam means (9) for entrainment of the corresponding carriages (2) of the strips (1).

5. A display board according to Claim 4, characterised in that the cam entrainment means include a catch element (9) which pivots between a raised operative position and a lowered rest position, a cam (12), which is stationary relative to the rotary disc (8), for causing pivoting of the catch element (9) between its raised and lowered positions during rotation of the rotary disc (8) and abutment members (10) carried by the carriages (2) and engageable by the pivoting catch element (9) in its raised position.

6. A display board according to Claim 4, characterised in that the motor-driven control means include a plurality of motors (13) for rotating the rotary discs (8).

7. A display board according to Claim 4, characterised in that the motor-driven control means include a single motor for driving the rotary discs (8) simultaneously.

8. A display board according to one or more of the preceding claims, characterised is that the strips (1) extend vertically.

9. A display board according to one or more of the preceding claims, characterised in that the strips (1) extend horizontally.

FIG. 1

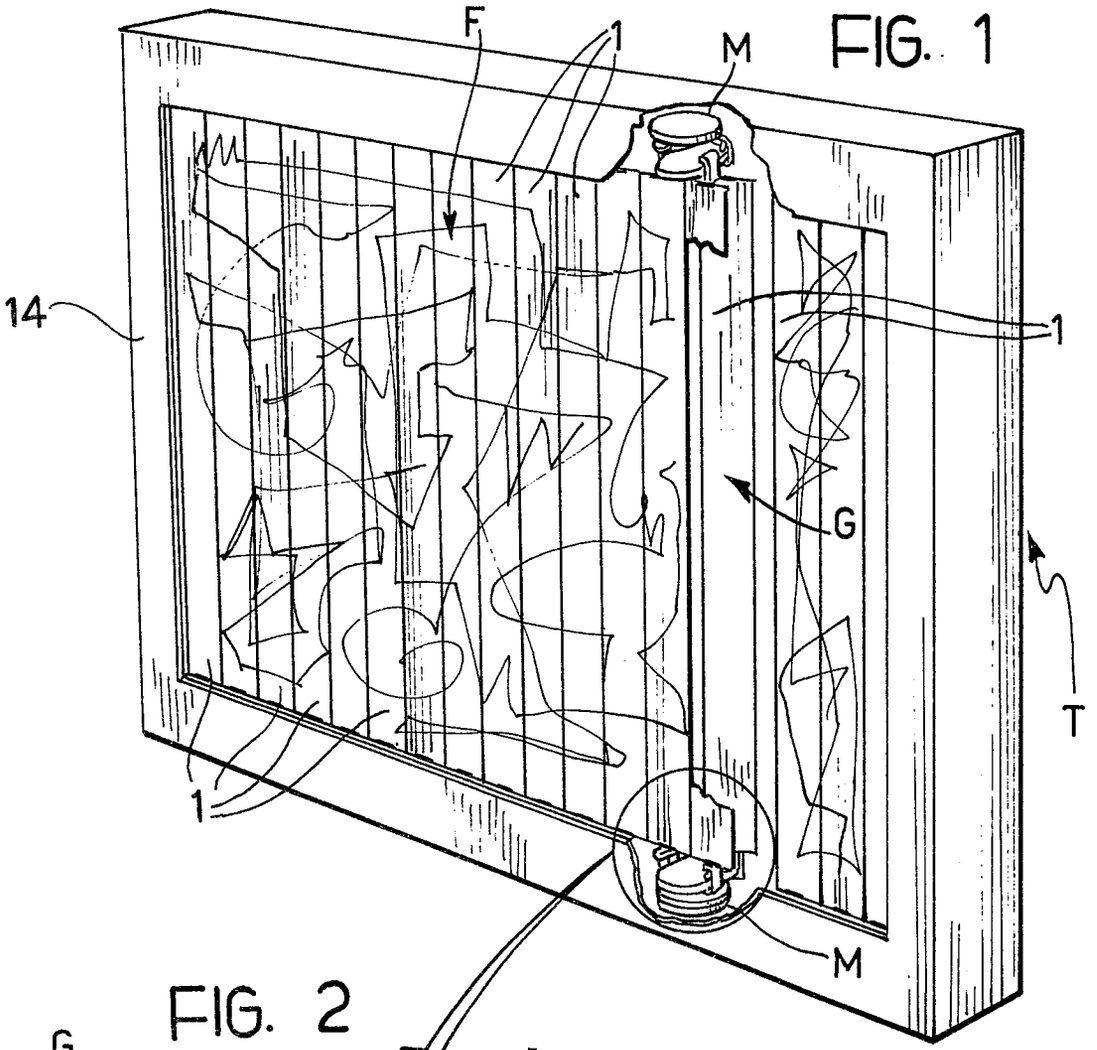

FIG. 2

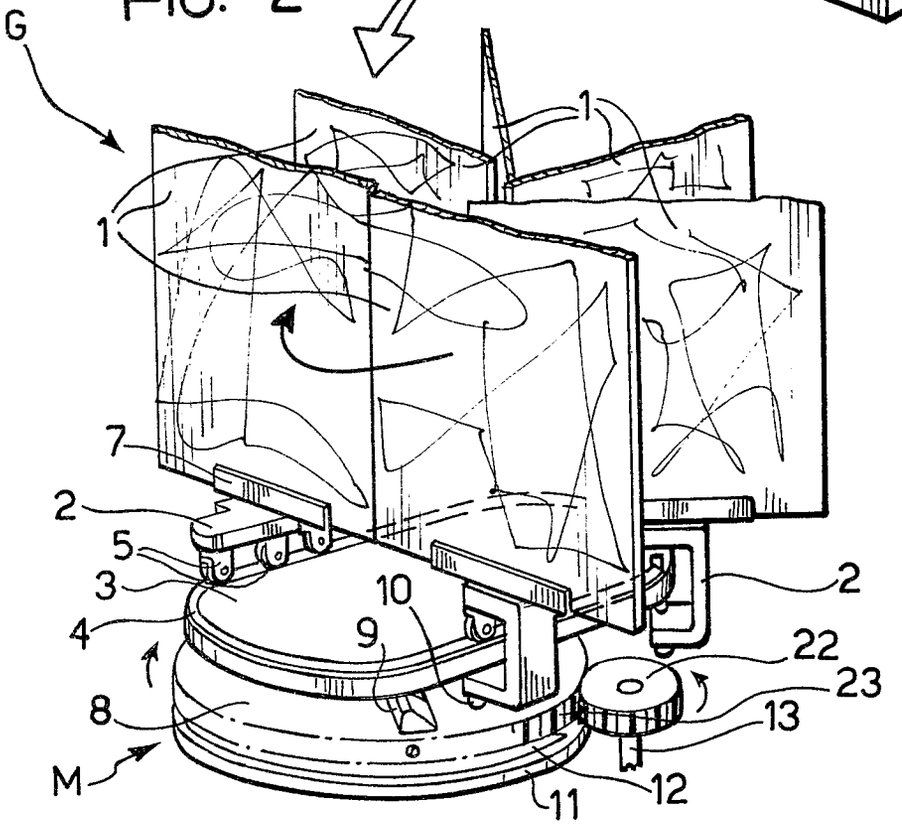

FIG. 3

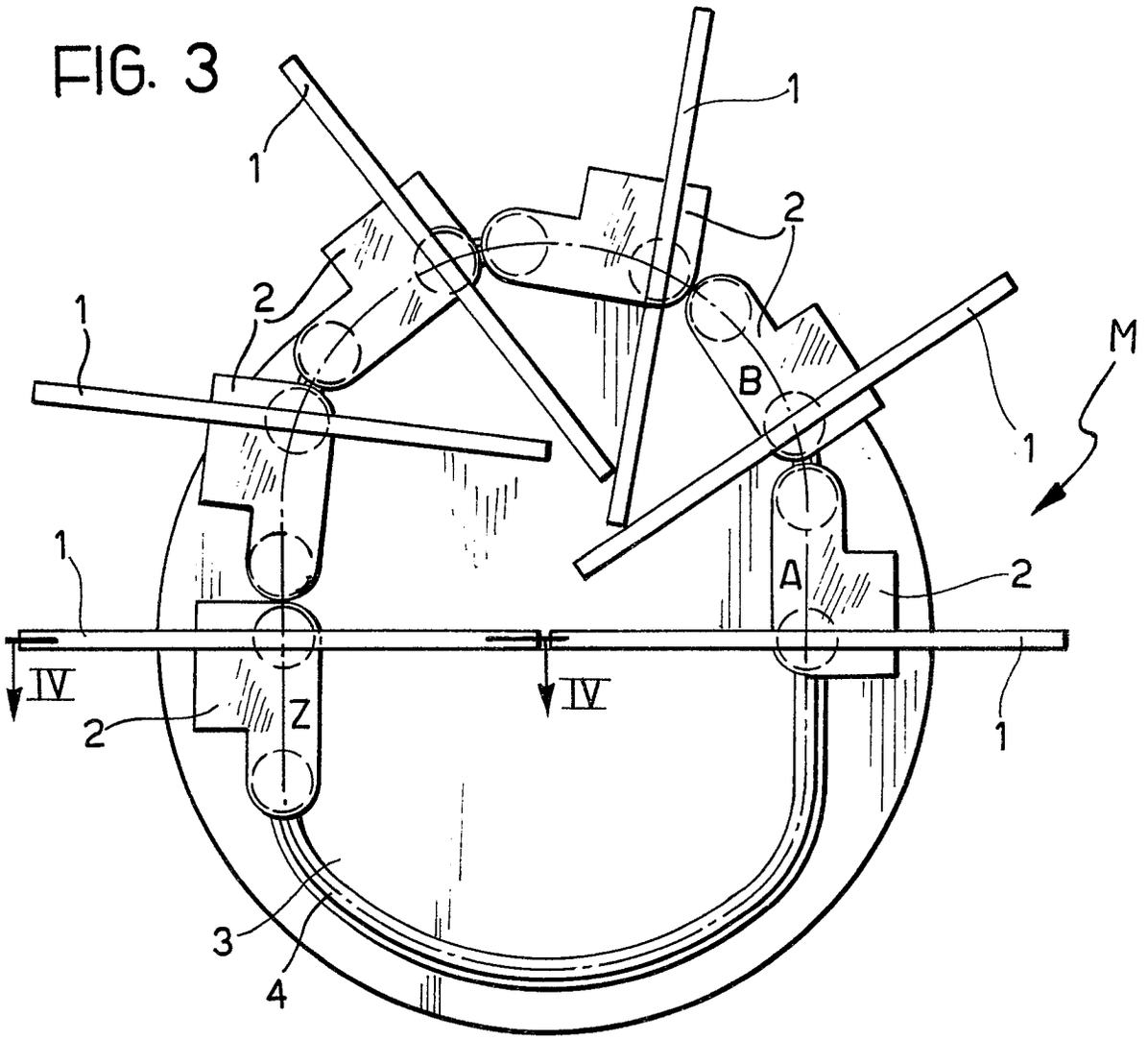

FIG. 4

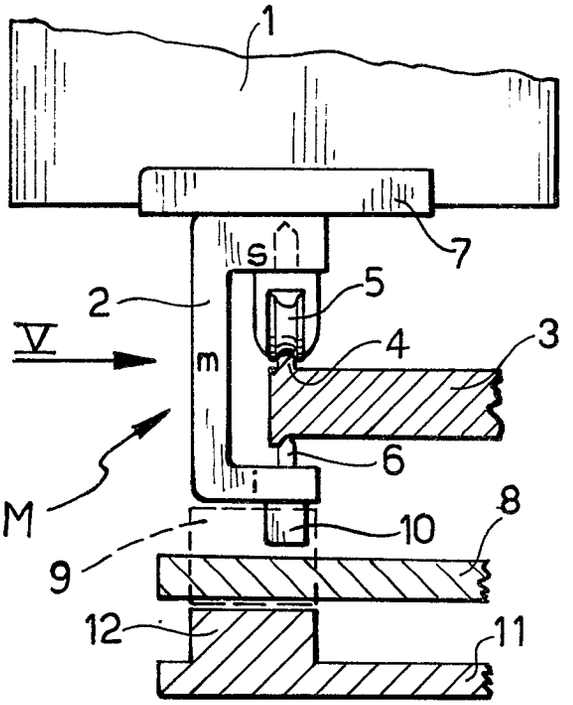

FIG. 5