April 22, 1958 A. V. CARBONE 2,831,580

DISPLAY DEVICE

Filed Nov. 24, 1954 2 Sheets-Sheet 1

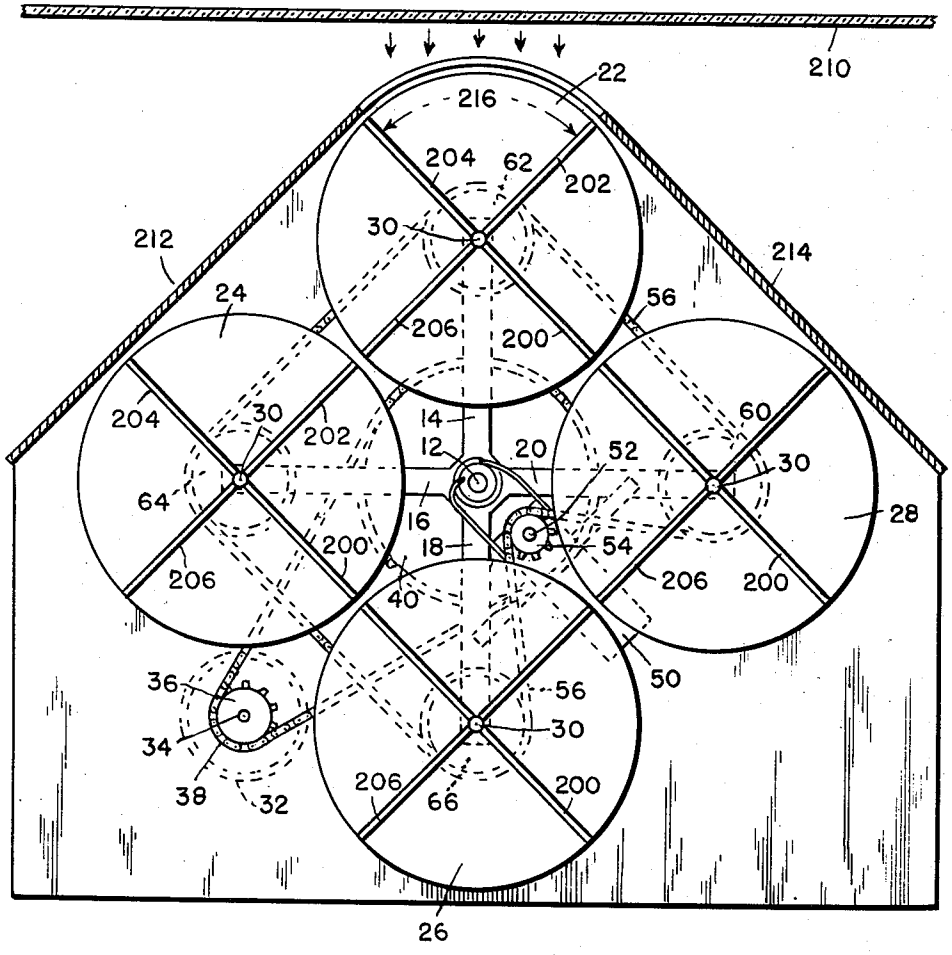


FIG. 1.

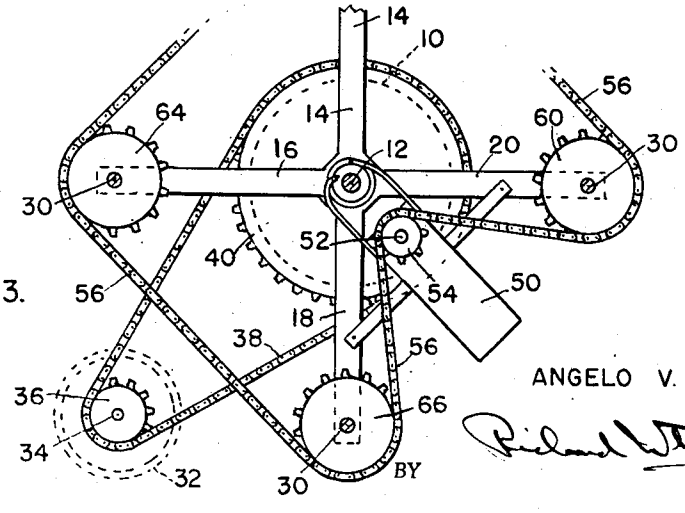


FIG. 3.

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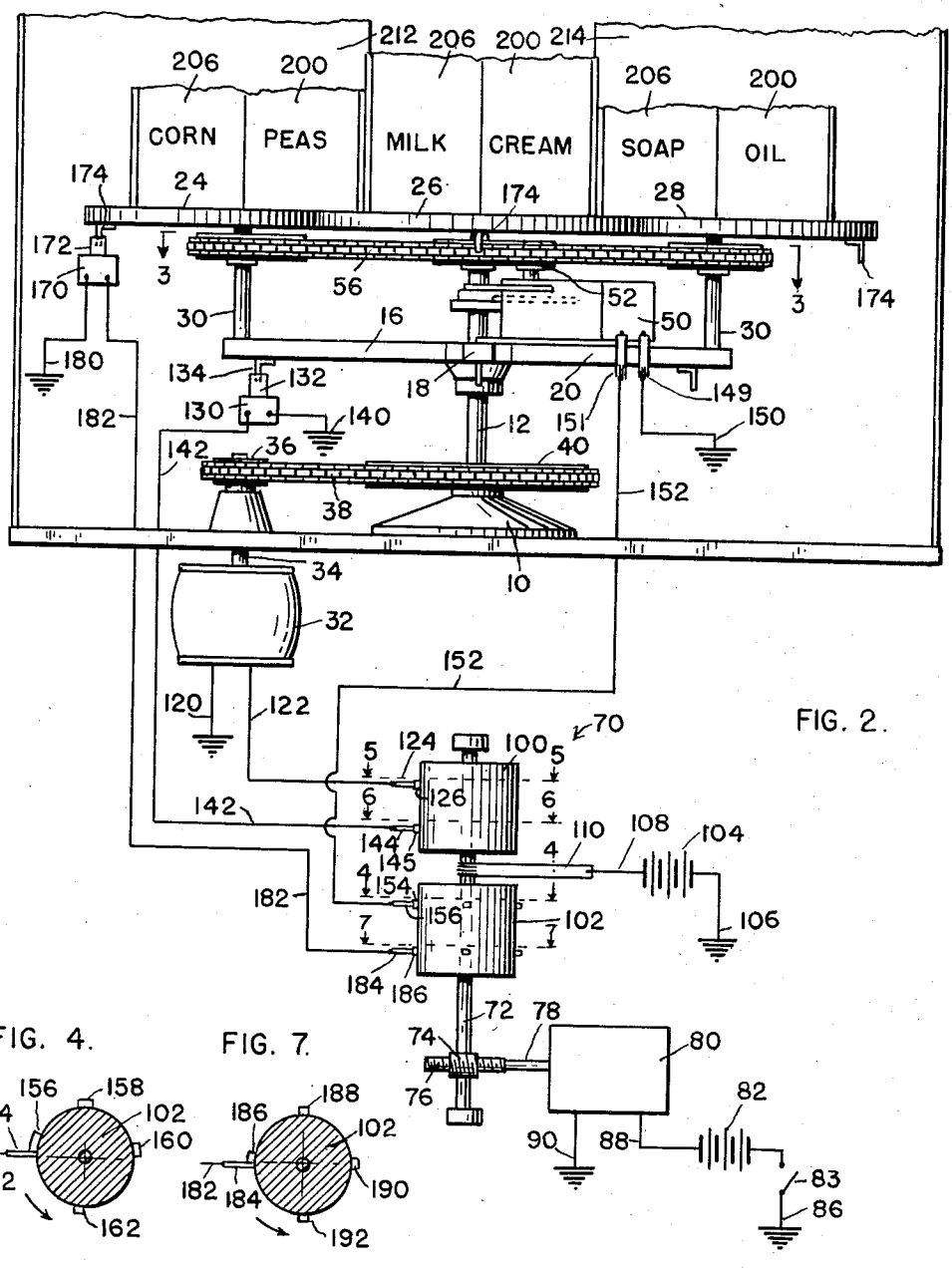


FIG. 2.

FIG. 4.

FIG. 7.

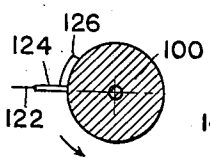


FIG. 5.

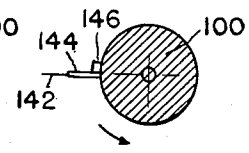


FIG. 6.

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DISPLAY DEVICE

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Application November 24, 1954, Serial No. 470,972

2 Claims. (Cl. 211—1.6)

This invention relates to advertising display devices and its primary object is to provide apparatus of that character, particularly adapted for use for purposes of display in store windows, which by intermittent actuations affords the exhibition of a series of a large number of individual lay-outs displayed in succession to the viewer.

In accordance with the preferred embodiment of my invention the device includes a series of platforms, each individually rotatable to bring different portions of each platform successively into view, the platforms being mounted on an intermittently movable support which advances after the complete rotation of an individual platform to bring the next successive platform into view, the apparatus being actuated by a novel timing mechanism and embodying novel elements which in combination, are effective in operation and unusually inexpensive in construction.

In the drawings:

Fig. 1 is a plan view of my display device;

Fig. 2 is an elevation view of the device showing diagrammatically certain electrically actuated elements;

Fig. 3 is a detail plan view of one of the drives partly in section taken on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2 showing one element of the timing mechanism;

Fig. 5 is a horizontal section on the line 5—5 of Fig. 2 showing another element of the timing mechanism, and

Figs. 6 and 7 are detail horizontal sections on the lines 6—6 and 7—7, respectively, of Fig. 2.

Referring to Figs. 1 and 2, the device is supported on a stand 10 in which the vertical shaft 12 is journalled. Fixed to and protruding horizontally from the shaft 12 to rotate therewith is a supporting frame composed, in the embodiment illustrated, of four arms 14, 16, 18 and 20, on which the circular, disc-like platforms 22, 24, 26 and 28 are rotatably mounted by means of a vertical shaft 30 for each platform, to which the platform is secured and which extends downwardly in a bearing formed on the extremity of its corresponding arm 14, 16, 18 and 20.

The shaft 12 is periodically rotated in a manner which will appear by motor 32 suitably mounted in stationary position and having a vertically extending shaft 34 carrying fixed to it a sprocket 36 (Fig. 3) about which chain 38 is entrained. The chain 38 is also entrained about sprocket 40 secured to the shaft 12. In this way the supporting frame composed of arms 14, 16, 18 and 20 will rotate in the counterclockwise direction as viewed in Fig. 1 whenever motor 32 is energized.

Platforms 22, 24, 26 and 28 are rotated by electric motor 50 mounted between the arms 18 and 20 of the supporting frame to rotate with the frame about the shaft 12 and having a drive shaft 52 carrying fixed to it the sprocket 54. Chain 56 trained about sprocket 54 to be driven thereby is also trained about sprocket 60 secured to the shaft 30 supporting platform 28 and, in like manner, about sprockets 62, 64 and 66 secured, respectively, to the several shafts 30 supporting the platforms 22, 24, and 26, and thence the chain returns around sprocket 54.

In this manner all of the platforms rotate whenever motor 50 is energized.

At 70 in Fig. 2 is indicated a timing device for effecting intermittent rotation of the supporting frame arms 14, 16, 18 and 20 and an intermittent rotation of the several platforms in correlation with the rotation of the supporting frame. The timer 70 has a shaft 72 carrying a worm wheel 74 driven by worm 76 on drive shaft 78 of motor 80 driven from a power source indicated diagrammatically at 32 connected at one terminal to ground through lead 86 and at the other terminal to the motor through lead 88. The other terminal of the motor 80 is grounded at 90. Starting switch 83 completes the circuit from power source 82 to ground as shown.

By this mechanism shaft 72 rotates slowly and steadily. For illustrative purpose I shall give an example of the relative time periods that may effectively be employed and in the example the shaft 72 rotates at a rate which may be of the order of about 1 revolution every two minutes.

Shaft 72 carries fixed to it to rotate therewith an upper drum 100 and a lower drum 102. The drums may be made of electrically conducting material and they are energized from a source of power diagrammatically shown at 104 which is grounded through lead 106 and connected by lead 108 to a brush 110 which engages the shaft 72. Suitable insulation is interposed between shaft 72 and ground through the motor 80 as by insulating the worm wheel 74 from shaft 72.

Considering first the intermittent drive of the motor 32 for rotating the supporting frame, one terminal of the motor is grounded at 120 and the other terminal is connected by lead 122 to contact 124 which protrudes into the path of an arcuately shaped contact 126 (see also Fig. 5) protruding from and electrically connected to the drum 100 in circuit with the power source 104. When contact is made between elements 124 and 126 during rotation of the drum 100, current flows from the source 104 through these contacts to the motor 32 to actuate the motor and rotate the supporting frame. This rotation continues for a period of time commensurate with the arcuate length of the contact 126 and when the contact 124 leaves the contact 126, the motor stops and the rotation of the supporting frame ceases. In the example given a period of the order of 5 seconds may suffice for this operation.

In order that the position at which the supporting frame comes to rest when the motor 32 stops may be accurately predetermined, my device includes stop mechanism including a solenoid 130 having a core 132 which protrudes into the path of the depending lug 134 secured to the supporting frame member 16.

In initiating rotation of the supporting frame, core 132 of the solenoid 130 must first be retracted from its position in the path of travel of the lug 134. For that purpose solenoid 130, grounded through one terminal at 140, is connected at its other terminal through lead 142 with a contact 144 which engages a contact 146 (Fig. 6) protruding from the drum 100.

The drum 100 is shown in the same position in Figs. 5 and 6 relative to the contacts 124 and 144 and it will be observed from a comparison of these views that energizing of the solenoid 130 to retract the core 132 takes place immediately prior to energizing of motor 32 and continues for a brief interval thereafter to assure that the core 132 is out of the way of lug 134 when rotation of motor 32 is initiated and then returns to its position in the path of lug 134 depending from the next succes-

sive arm, in this instance the arm 14, before that arm arrives in position in proximity to the core 132. To assure that timing, contact 146 should be no longer than about one half as long as contact 126. Upon further complete rotation of the drum 100, the solenoid core 132 is again retracted and the supporting frame rotated the distance required to move arm 20 to the position shown in Figs. 1 and 2 for the arm 16, and so on.

Considering now the actuation of the motor 50 to rotate the platforms simultaneously on their several supporting shafts 30, this motor is grounded through one terminal at 150, being connected thereto through brush 149 to permit the relative motion between motor 50, carried by the rotating frame, and the stationary ground. At the other terminal the motor is connected through brush 151 and lead 152 to contact 154 protruding into the path of arcuately shaped contact 156 protruding from the side of the drum 102. Drum 102 has four such arcuate contacts protruding from its surface in the path of contact 154 and the three other arcuate contacts are designated 158, 160 and 162. Whenever any one of these four contacts engages the contact 154, motor 50 is energized to drive chain 56 and rotating the platforms until contact is again broken with contact 154. As an example of the timing which may be employed the actuation of motor 50 may be for about 3 seconds occurring every ½ minute.

As was the case with the supporting frame above described, the rest position of the platforms is accurately predetermined upon deenergization of the motor 50 by a stop mechanism including a solenoid 170 having a retractable core 172 protruding into the path of lug 174 shown as depending from platform 24. This solenoid has one of its terminals grounded at 180 and the other terminal connected by lead 182 with the contact 184 which protrudes into the path of the arcuate contact 186 protruding from the drum 102. When contact is made between elements 184 and 186, core 172 of solenoid 170 is retracted out of the path of depending lug 174. The drum 102 and contacts shown in Figs. 4 and 7 are in the same relative positions and the parts are so arranged that contact is made between elements 184 and 186 immediately prior to contact between elements 154 and 156 and continues until after the motor 50 has been energized. Contact is then broken between elements 184 and 186 early enough to assure restoration of core 172 to its protruding position in the path of travel of the next succeeding lug corresponding to the lug 174 and for this purpose contact 186 should be no more than about one half as long as contact 156.

Drum 102 carries four contacts corresponding to contact 186 designated 188, 190 and 192 which correlate with the contacts 158, 160 and 162 in an apparent manner.

Each of the platforms 22, 24, 26 and 28 is divided into quadrants by partitions 200, 202, 204 and 206 presenting four sectors of approximately 90° each, of which one will be viewed at any given time. The numeral 210 indicates a store window through which the device is viewed and the apparatus may desirably be masked from view by the partitions 212 and 214 leaving an opening through which one quadrant sector of any platform only is viewed at one time with the parts in position illustrated in Fig. 1. This quadrant is designated 216 and extends between the partitions 202 and 204 of the platform 22.

With the timer rotating at about one revolution per two minutes quadrant 216 will remain in view for a brief period of slightly less than one half minute, corresponding to a quadrant of rotation of the drum 102 until solenoid 170 is energized by contact between elements 184 and 188, retracting core 172, when contact will be made between elements 154 and 158 and maintained for a period of time adequate to rotate all of

the platforms about 90° or until the sector delineated by partitions 200 and 202 of platform 22 occupies the space shown in Fig. 1 as occupied by sector 216. At this time the next succeeding bracket 174 will abut the core 172 of solenoid 170 which has in the meantime protruded outwardly from the solenoid when contact 184 left the contact 186.

Preferably the solenoid 170 is mounted in fixed position and each of the platforms 22, 24, 26 and 28 has four depending lugs spaced 90° apart and equidistant from the supporting shaft 30 so that its path of travel intersects the position of the core 172.

After the four sectors of platform 22 have thus been exposed to view, occupying for example a period of about two minutes of rotation of the timer 70, contact will be made between elements 144 and 146 to retract core 132 of solenoid 130 from the path of travel of depending lug 134, whereupon motor 32 will be energized by contact between elements 126 and 124 and this contact will be maintained for a period of time necessary to advance platform 28 to the position shown in Fig. 1 for the platform 22. Platform 28 will dwell in this position until its four quadrants have been exposed to view when the motor 32 will again be energized to bring platform 26 into view and the same operation will be repeated for platform 24.

In this manner the device will successively expose 16 areas to view through the window 210 employing apparatus which is reliable in operation and simple and inexpensive in construction.

I claim:

1. In an advertising display device, the combination of a series of rotatably mounted platforms, a rotatable support for the platforms, a pivotal mounting for the support about which the support may rotate, the platforms being mounted on the support equidistantly from the pivotal mounting so that rotation of the support brings the platforms successively into and out of a predetermined viewing position, fixedly mounted power operating means for rotating the support, timing mechanism for energizing said power operated means periodically to rotate the support at predetermined intervals to move one platform out of said predetermined viewing position and to move the next succeeding platform into said position, stop means to hold the support stationary between said rotation periods, a second power operated means mounted on the support to rotate therewith about the pivotal mounting for the support, means connecting said second power operated means to all of the platforms to rotate all of the platforms simultaneously, a second timing mechanism for energizing said second power operated means in timed relation to the operation of said first power operated means to rotate all of the platforms intermittently while said stop means holds the support stationary and a second stop means for holding the platforms stationary intermediate their said intermittent rotations and while the support is held stationary by said first stop means.

2. In an advertising display device, the combination of a series of rotatably mounted platforms, a rotatable support for the platforms, a pivotal mounting for the support about which the support may rotate, the platforms being mounted on the support equidistantly from the pivotal mounting so that rotation of the support brings the platforms successively into and out of a predetermined viewing position, fixedly mounted power operating means for rotating the support, timing mechanism for energizing said power operated means periodically to rotate the support at predetermined intervals to move one platform out of said predetermined viewing position and to move the next succeeding platform into said position, means to stop the movement of said support between said rotation periods, a second power operated means mounted on the support to rotate therewith about the pivotal mounting for the support, means connecting said second power op-

erated means to all of the platforms to rotate all of the platforms simultaneously, a second timing mechanism for energizing said second power operated means in timed relation to the operation of said first power operated means to rotate all of the platforms intermittently, and second means to stop the movement of the platforms.

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