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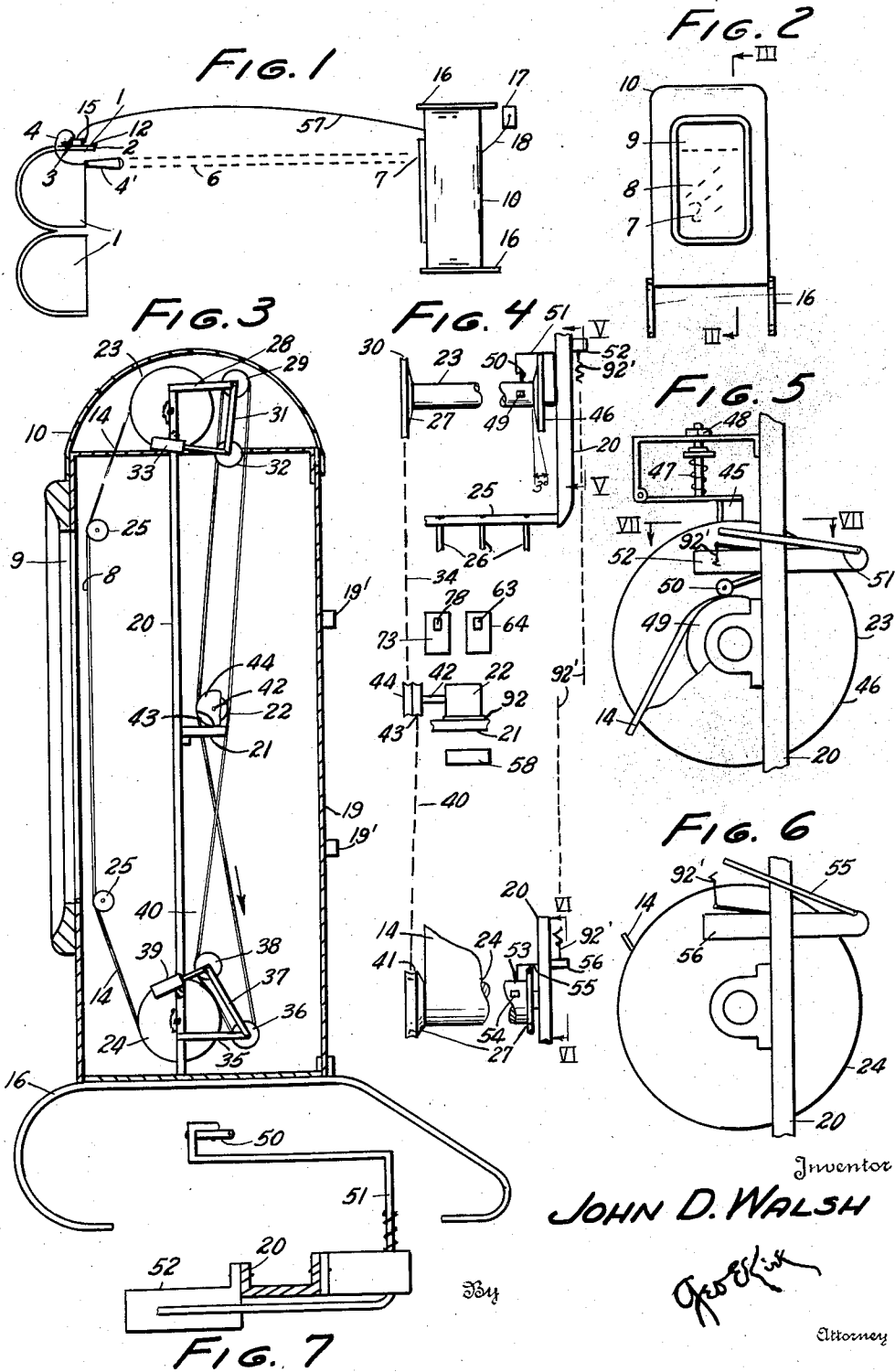
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SCHEDULING STRIP TRAVEL FOR VIEWING

Filed June 17, 1953

2 Sheets-Sheet 1



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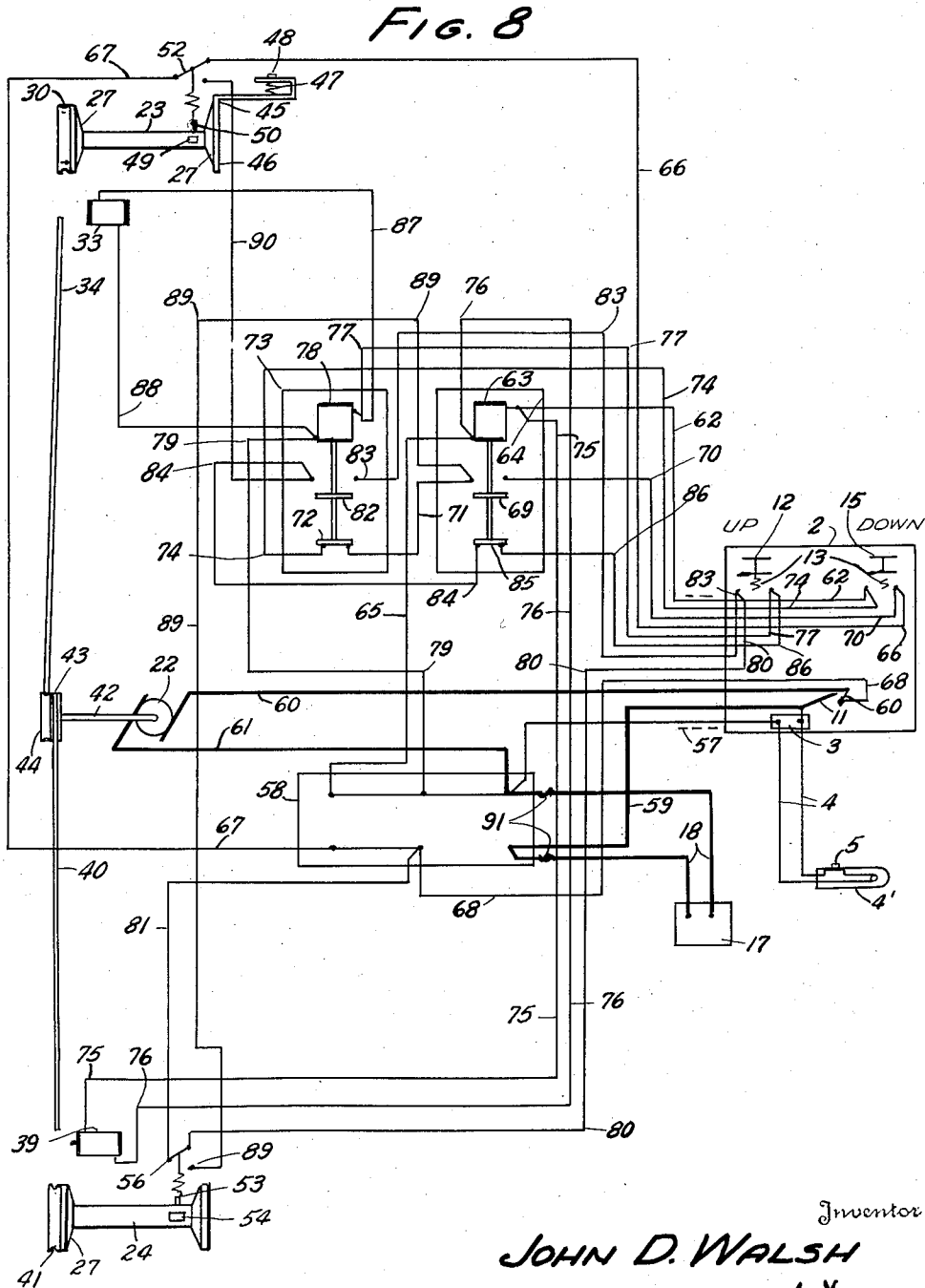
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2 Sheets-Sheet 2



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The mechanical device

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SCHEDULING STRIP TRAVEL FOR VIEWING

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9 Claims. (Cl. 242—55)

This invention relates to a display device. More particularly, it deals with a device which may display commercial merchandise, such as fabrics, decorations and wall coverings, and/or a strip of information bearing material including a speech prompting device.

It is an object of this invention to provide an efficient, simple, effective, economic, and remote controllable display device.

Another object of this invention is to provide a display device having a continuously running driving means and automatic reversing means therein so that the material being displayed may be continuously observed.

Another object of this invention is to provide a display device having an electrical lockout control means so that it is impossible to actuate both driving drums simultaneously to damage the material being displayed thereon.

Generally speaking, the display device of this invention comprises a viewing strip windable back and forth on two spaced drums, driving means adjacent said drums which are continuously connected to and driven by an electric motor, electrically controllable clutch means for actuating said driving means into driving engagement with said drums for driving them in either direction at will or stopping them, an electric lockout control means for operating said clutch means so that when one clutch is engaged to drive one drum the other is disengaged from driving the other drum and vice versa, and reversing means connected to each drum to detect when said strip is unwound from that drum and to automatically disengage the clutch means for driving the other drum and engage the clutch means for driving the unwound drum to rewind said strip thereon.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a plan view of an embodiment of this invention adapted for merchandise display;

Fig. 2 is a front view of the window side of the cabinet in the embodiment of Fig. 1;

Fig. 3 is an enlarged vertical section through the cabinet of Fig. 2 in the region of the line III—III in Fig. 2;

Fig. 4 is a partial view from the right looking into Fig. 3, omitting the cabinet and showing some features of the strip carrier and controls;

Fig. 5 is an enlarged view of the brake and microswitch for the upper roll or drum, from the line V—V in Fig. 4;

Fig. 6 is an enlarged view similar to Fig. 5, but for the lower roll, and from the line VI—VI in Fig. 4;

Fig. 7 is a plan view of the microswitch from the line VII—VII in Fig. 5;

Fig. 8 is an electrical wiring diagram of the general controls for the device of this invention.

Referring now to Fig. 1, observer positions or chairs 1 provide a mounting for a control panel 2 where a connection 3 assembles an electric conductor means 4 to a flashlight 4'. Said light 4' has a switch 5 for a clerk or observer to direct the light rays 6 to a location 7 to be identified on the display section 8 disclosed at a viewing window 9 of the cabinet 10. At the panel 2, there is a main switch 11 (see Fig. 8) to cut in electric power for the equipment to be used. A push button switch 12 has a kick-in or self-recovering spring 13, and when it is depressed, the direction of travel of the strip 14 having the display section 8 is in the Up direction. A similar switch 15 at the panel 2 is for effecting the Down direction of travel of the strip 14 in the cabinet 10, and said switch 15 also has a self-recovery spring 13. Since the cabinet 10 may be readily portable due to its ability to be shifted on slide bases or runners 16, it may be located so that a connection 17 at an electric outlet connects in power means line 18 to said cabinet 10, which power means or electric current supply may be 60 cycle 110 volts alternating current.

Referring now to Fig. 3, the cabinet 10 is shown with a rear or back section 19 which may be removed for access to the cabinet interior by lifting the section 19 upward and then outward by means of the handles 19' thereon. Medially of the frame work 20 in the cabinet 10, there may be a bracket 21 for mounting a motor means 22. In said cabinet, there may be positioned an upper drum 23 and a lower drum 24 having a strip 14 extending therebetween. The strip 14 as it wraps and unwraps from the drum 23 may have an observation section, such as a display section 8 at the window 9 adjacent thereto and parallel with said strip 14, said strip 14 being held by guide bars or rollers 25 as it wraps or unwraps about the drum 24. For wide strip stock, such as wallpaper having a 19" width, and with the bar 25 not rotating, three tapes 26 (see Fig. 4) may provide a back support between bars 25 to reduce the tendency of the display to be damaged.

The backing provided by tapes 26 at the viewing window provides holding means for maintaining the strip 14 taut at this exposure region so as to prevent flutter of said strip 14. Since the backing may need to be quite strong, especially if said strip 14 is written on at the window 9, there should be provided reinforcing means to prevent puncture of said backing. In order that such hazard will not arise from a hand-held pointer, the light ray 6 provides specific identity region 7. With illumination for the window at the viewer station at the seats 1, a pointer need not contact the strip 14 and therefore will not cast a shadow thereon. In instances where it may be advantageous to illuminate the screen by its rear portion, the strip 14 may be transmissive or transparent, and such back illumination may be accomplished by fluorescent type lights.

It may be desirable to position said display device at other than vertical positions, such as horizontal. This may be accomplished by reflective viewing, that is using two mirrors to re-orient the image.

The flanges 27 of the drums 23 and 24 have an inward 3° taper which maintains said strip 14 in alignment so as to prevent fouling or damage to the strip 14 as it is wound or unwound on the drums 23 and 24. The strip carrying drums 23 and 24 are maintained in the frame on parallel shafts, so as to prevent sideways crowding or mis-alignment of said drums when relatively wide strip stock is used thereon. The straight travel direction achieved by the strip 14 as it travels in either direction on said drums and in its multiwraps at the drums maintains the edges of the strip uncrimped.

The strip 14 when being wound on the drums 23 or 24 may be blank or may have supplemental notations written thereon by directly inscribing such notations at the window 9, if the strip means 26 or a back support is sufficiently rigid to do so. Furthermore memoranda may be attached to said strip 14. The strip 14 may comprise a plurality of sections, such as wallpaper having a sufficient dimension to show a full design, even though there may be contained strips or portions for the border, ceiling, or applique. If the nature of the matter to be displayed is better served by anchoring said subject matter along a strip, such may be adopted. Furthermore, the strip itself may carry legend matter for showing an address or speech, which may be read off by the speaker.

A bracket 28 locates a follower pulley 29 coplanar with a pulley groove section 30 on the drum 23. Depending from the bracket 28, there is a swing arm 31 having at its lower end a pulley 32 adapted to be actuated by an energized solenoid 33 to bring the endless driving belt 34 into frictional driving contact with said drum groove section 30 for rotating the drum 23 in an upward winding direction for the strip 14.

In proximity to the lower drum 24, there also is a fixed bracket 35 similar to the bracket 28 mounting a follower pulley 36 and an upwardly directed swing arm 37 terminally carrying a pulley 38 which may be drawn by a solenoid 39 when it is energized, to push a driving belt 40 into frictional guiding contact with a groove section 41 on the lower drum 24. The embodiment shown in Fig. 3 discloses that the strip 14 is traveling downward past the window 9. However, said strip 14 may also travel in an upward direction. Fixed on the shaft 42 of the motor 22, there may be a pulley 43 for actuating the downwardly extending belt 40; and adjacent to the pulley 43 and fixed therewith there may be a pulley 44 for actuating an upwardly extending belt 34.

The occurrence of any electrical sound disturbance through the mounting 92 for the power motor 22 on the bracket 21 in the frame 20 is minimized, since the mounting 92 is a diaphragm spanning an opening in the bracket 21, which mounting may be rubber or the like having sufficient strength to position the motor 22 while sustaining the motor 22 from sagging into the opening in the bracket 21. The motor 22 may be either slow speed or have a built-in speed reduction. The solenoids 33 and 39 may be of screw type, or have the characteristics of a stalled motor in their thrown or holding-in action. When the unit is used in public, such as in a store, unauthorized tampering may be prevented by having the cut-in primary switch of a key type.

Since the drums 23 and 24 may carry a strip up to 200 feet in length, upon starting, momentum may be developed which may tend to carry the section 8, which is desired to be observed, past the window 9. In order to minimize such a hazard, a brake 45 (see Fig. 5) abuts against a frictional rim or face 46 of the drum 23. A spring 47 may be adjusted by a nut 48 to predetermine the amount of drag to be used in holding the equipment for the desired operation, such as step-by-step exposures at the window 9.

The display device of this invention may be set up for continuous operation, including automatic reversal, when a strip end is reached by the drum unwrapping operation, which strip end may be attached to said drum and may have a tapered or slotted portion therein. This operational practice may be taken into account when the strip 14 on a drum 23 or 24 is unwrapped therefrom, thereby exposing an opening or port 49 in the tubular shaft of the drum 23 or 24 (see Fig. 8). Since a roller 50 has been riding on the strip 14 as it was being unwrapped, and as the opening 49 beyond the end of the strip 14 or through said tapered or slotted portion in the end portion of said strip 14 is exposed, the roller 50 drops thereinto; and since it is spring actuated through its mounting 51, the microswitch 52 is actuated. The strip 14 then has

its direction of travel changed to wrapping about the drum 23 and unwrapping from the drum 24. As the limit of unwrapping is approached at the drum 24, the roller 53 shifts into a port 54 in the tubular core of the drum 24. A rockable mounting arm device 55 (see Fig. 6) from the roller 53 then operates a microswitch 56 to actuate automatic reversal of the strip travel direction in said display device. Spring means normally direct the rollers 50, and 53 to abut against the wraps of the strip 14, so that said rollers 50 and 53 will immediately enter their ports as soon as such are exposed.

The electrical control

The cabinet 10 may be placed at any desired location, such as in a salesroom, and the power connection 17, 18 may be assembled thereto. Viewer or demonstrator seats 1 may be placed at a convenient range for checking the exposures 8 through the window 9. The panel 2 may be attached to a seat 1 with a multi-wire cable connection 57 from the panel 2 to a cabinet 10.

The transmission apparatus effecting the cutting-in and cutting-out through the frictional application of the constantly live or driving belts 34 and 40, may serve as clutch connections which are independently operable through the wiring inter-connections in the control units, so that neither clutch nor drive may be cut in until the other is cut out.

With each solenoid 33 and 39 initially de-energized, the first step is to connect the power supply to the motor 22 which drives the endless belts 34 and 40. This operation may be accomplished by throwing switch 11 at the panel 2 into its On position. A power supply conductor 18 extends to a terminal panel 58 with a line 59 (see Fig. 8) therefrom through the cable 57 to one side of the switch 11. From the other side of the On switch 11, a conductor 60 extends in the cable 57 to the motor 22. From the other side of the motor 22, a conductor 61 extends to the panel 58 and then through the other current supply conductor 18 thus completing the motor operating circuit for the device. The electric wiring from the power supply has a fuse means 91 (see Fig. 8) between the conductors 18 and the panel 58 and the cabinet 10, which serves as a safety provision.

It is assumed that in neither drum 23 nor 24 is a port 49 or 54, respectively, exposed and therefore, that the microswitches are not to be effected through the depressing of the Down push button 15. A conductor 62 therefrom extends to a relay 63 at the panel 64 with line 65 from the relay 63 through the panel 58 where it is connected to the current supply 18. At the other side of the switch 15, there is a conductor 66 extending to the switch 52 and thence by a conductor 67 to the panel 58, with a conductor 68 to the panel 2 through the closed switch 11 to the conductor 59 which again extends to the panel 58 for completing the circuit through the other supply 18. The relay or coil 63 is energized, and with the closing of the switch 15 at the coil 63, a switch 69 is closed thereby connecting the conductor 70 from the switch 15 to a conductor 71 in the switch 69. The conductor 71 extends to a switch 72 at a panel 73 with a conductor 74 therefrom back to the switch 15. The energizing of the coil 63 at the closing of the switch 69 has provided a by-pass connection for the conductors 66 and 62 by the conductors 70 and 74, and the coil 63 remains energized even if the switch 15 has been depressed momentarily.

From the coil 63, a conductor 75 extends to solenoid 39 and a conductor 76 from the other side of the coil 63 places the solenoid 39 in parallel with the energized coil 63. This means that the roller or pulley 38 has pushed the belt 40 over to ride in the groove 41 of the drum 24 and therefore drum 24 begins winding the strip 14 thereon and thereby unwraps the strip 14 from the drum 23. During this unwrapping operation, which may be continuous, the observers may identify specific features

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through the use of the flashlight 4' for illuminating specific areas 7. Should it be desirable to stop the strip 14 at a particular position, the switch 11 may be thrown to the Off position. Inasmuch as the switch 15 was only momentarily actuated, the strip 14 does not start to move upon the actuation of the switch 11 to its On position, since the opening of the switch 11 de-energized the coil 63.

It may also be desirable to reverse the strip 14 such as for re-checking a portion which has already been viewed. Upon depressing of the Up switch 12, a conductor 77 is connected to a relay coil 78 on the panel 73 and a conductor 79 on the coil 78 is connected to the panel 58 and therefrom to one side of the current supply 18. Also from the switch 12, there is a conductor 80 to a closed switch 56 which is connected to a conductor 81 back to the other side of the panel 58 for connection through the conductor 68, the closed switch 11 to the conductor 59 having been connected to the other side of the current supply 18. The circuit is thus completed at this momentary closing of the Up switch 12 for the coil 78 to be energized, which opens the switch 72 to control functioning from the Down switch 15. The energized coil 78 closes a switch 82 to connect a conductor 83 from the switch 12 to a conductor 84, then to a switch 85 which closed as the coil 63 was deenergized and thence by conductor 86 to the switch 12. The closing of the switch 82, due to energizing of a coil 78, is a by-pass for the switch 12 during its momentary closing, which has been effected to actuate upward travel of the strip 14, since the energized coil 78 is in parallel with the solenoid 33 through the conductors 87 and 88.

During the upward travel of the strip 14, if it were not desirable to stop said strip 14 for checking a particular design or region near the position where the reverse took place, the strip may be allowed to run to the limit of winding upon the drum 23 and unwinding from the drum 24, so as to operate the automatic stop initiated by the roller 53 riding into the port 54 when the end of the strip is approached at the drum 24. This riding of roller 53 into port 54 changes the position of the switch 56 by cutting out the conductor 80 and cutting in a conductor 89, which extends to the open switch 69 at the energized coil 63. The opening of the switch 56 to the conductor 80 and cutting in the conductor 89 de-energizes the coil 78. The conductor 89 to the open switch 69, now independent of the switch 69, has a connection via the conductor 71 to the closed switch 72 and thence via the conductor 74 to the open switch 15 and from thence via the conductor 62 to energize the coil 63, since the circuit is now completed by the conductor 65 to the panel 58 to a supply conductor 18. The conductor 81 from the other side of the switch 56 from the conductor 89, has a connection to the panel 58 and the other current supply conductor 18, permitting the coil 63 to be automatically energized, and the strip 14 is therefore unwound from the drum 23 and wound upon the drum 24.

When the strip 14 unwinding from the drum 23 exposes the port 49, the switch 52 is actuated to disconnect the conductor 66 and to connect in a conductor 90 to the open switch 82; but there is a connection to the conductor 84 past the closed switch 85, since the opening of the conductor 66 at the switch 52 has de-energized the coil 63. From the switch 85, the conductor 86 extends to the open switch 12, and from there via the conductor 77 to the coil 78, which is to be energized as conductor 79 therefrom is connected to the panel 58 for opposite supply conductor 18, which is connected to the conductor 67 from switch 52.

The sensitivity of the microswitches 52 and 56 in the electric non-drive in a drum control may have an extensible tension means 92' (see Figs. 4, 5 and 6) so that as one switch is closed, there will be a slight slack for the other to be opened. These are electrical by-pass or sequential control mechanism reacting with the inde-

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pendently positionable drive effecting means 33 and 39; reversal of said strip 14 being accomplished either manually or automatically. In normal practice with said device being in its vertical position, the single drag or brake 45 is sufficient to stop said drums 23 and 24 when it is so desired. In the event that said device may be positioned horizontally, any over-running by the other drum may be avoided by locating another drag or brake thereon.

While there are described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of this invention.

What is claimed and it is desired to secure by Letters Patent is:

1. In a remote controllable viewing strip device windable back and forth on two spaced drums, the improvement comprising: a continuously running driving motor, independent and separate opposite rotating friction driving means adjacent each of said drums continuously connected and driven by said motor, means for movably mounting each said driving means for movement radially of its corresponding drum into and out of frictional driving engagement with a rotatable surface of said corresponding drum, separate electrically controlled clutch means for moving said driving means into and out of frictional driving engagement with a rotatable surface of said corresponding drums, electrical lock-out control circuits having separate manual switches for selectively operating said clutch means so that when one clutch is engaged to drive one drum the other is disengaged from driving the other drum and vice versa, manual switch means for controlling the disengagement of said clutch means and the stopping of said motor, and electrical reversing means connected to each drum to detect when said strip is substantially unwound from that drum and to automatically disengage the clutch means from driving the other drum and engage the clutch means for driving the unwound drum to rewind said strip thereon.

2. A viewing strip device according to claim 1 including guide means for said strip between said drums.

3. A viewing strip device according to claim 1 including separate by-pass holding circuits for said manual switches.

4. In a remote electrically controlled viewing strip device windable back and forth on two spaced drums, the improvement comprising: a manual control panel remote from said drums and strip and having an up switch, a down switch, and an off and on switch; a driving means adjacent said strip for alternately driving said drums in opposite directions controlled by said off and on switch, said driving means comprising separate rotating means movable radially with respect to its corresponding drum into and out of frictional engagement with a rotatable surface of said drum, a first electrically operated clutch means adjacent one of said drums and controlled by said up switch when said driving means is operating for moving said driving means to rotate one of said drums, a second electrically operated clutch means adjacent the other of said drums and controlled by said down switch when said driving means is operating for moving said driving means to rotate said other of said drums, and electrical lock-out circuits between said clutch means so that only one of said clutch means may be operated at one time, said electrical lock-out circuits including separate relays energized in multiple with the corresponding operated clutch means, and contacts operated by each said relay for breaking the energizing circuit of the other relay and its corresponding clutch means.

5. A viewing strip device according to claim 4 including separate by-pass holding circuits for said up switch and said down switch for maintaining their corresponding clutch means engaged after the manual release of said switches.

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6. A viewing strip device according to claim 4 including an automatic electrical control means adjacent each drum operable when said strip is substantially unwound from that drum to disengage the clutch means for driving the other drum and to engage the clutch means for driving said substantially unwound drum to rewind said strip thereon.

7. A viewing strip device according to claim 6 wherein said automatic control means includes electrical switches and means on said drums uncovered by the substantial unwinding of said strip from that drum for operating said switches.

8. A viewing strip device according to claim 4 wherein said relays include additional contacts for establishing separate by-pass holding circuits for the correspondingly operated clutch means controlled by the corresponding one of the up and down switches.

9. In a remote electrically controlled viewing strip device windable back and forth on two spaced drums, the improvement comprising: a manual control panel remote from said drums and strip and having an up switch, a down switch, an off and on switch; a driving means adjacent said strip for alternately driving said drums in opposite directions controlled by said off and on switch, said driving means comprising a continuously operated motor and separate rotating means movable radially with respect to its corresponding drum comprising idler pulleys mounted adjacent each of said drums, belts connecting said motor with said idler pulleys, one of which belts being crossed to reverse the direction of movement of its idler pulley with respect to that of the other idler

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pulley, whereby said clutch means move said idler pulleys and said belts thereon adjacent their corresponding drums into and out of frictional driving engagement with the rotatable surfaces of said corresponding drums, a first electrically operated clutch means adjacent one of said drums and controlled by said up switch when said driving means is operating for moving said driving means to rotate said one of said drums, a second electrically operated clutch means adjacent the other of said drums and controlled by said down switch when said driving means is operating for moving said driving means to rotate said other of said drums, and electrical lock-out circuits between said clutch means so that only one of said clutch means may be operated at one time.

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