United States Patent [19]

Banach

[11] **3,854,123**

[45] **Dec. 10, 1974**

[54] **REMOTELY CONTROLLABLE TUNING SYSTEM FOR TELEVISION TUNERS**

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[73] Assignee: **Zenith Radio Corporation,** Chicago, Ill.

[22] Filed: **Apr. 2, 1973**

[21] Appl. No.: **347,289**

[52] **U.S. Cl.**..... **340/171 R,** 178/DIG. 15, 325/393

[51] **Int. Cl.** **H04b 1/16**

[58] **Field of Search**..... 340/171 R; 178/DIG. 15; 325/393, 391

[56] **References Cited**

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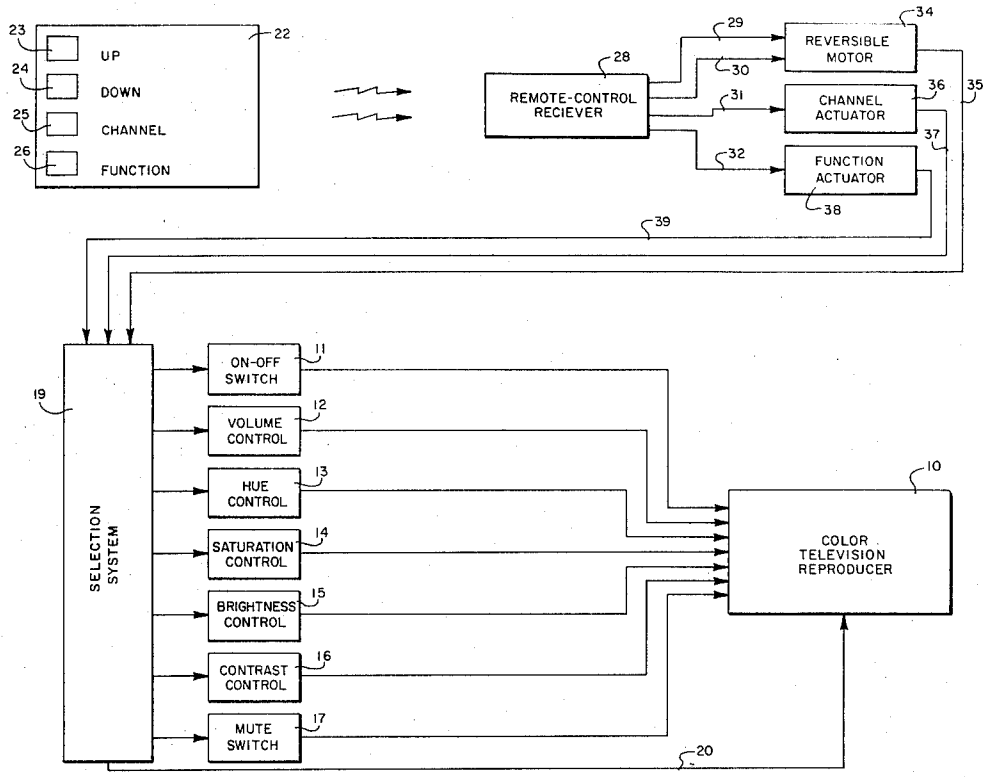
Primary Examiner—Harold I. Pitts

Attorney, Agent, or Firm—Nicholas A. Camasto; John J. Pederson

[57] **ABSTRACT**

A television receiver has its usual plurality of different functions which are to be controlled. These may include the selection of different channels and/or the adjustment of different performance parameters such as volume, brightness, contrast, color quality, muting and on-off. A plurality of operators are individually spaced successively apart to control the different functions upon receipt of an appropriate impulse which may be either mechanical or electrical. To deliver such an impulse, an apparatus is movable to different positions that correspond to the different operators. External command signals are used to selectively control movement of the apparatus between the different positions and to effect delivery of the impulse at any given position.

14 Claims, 6 Drawing Figures



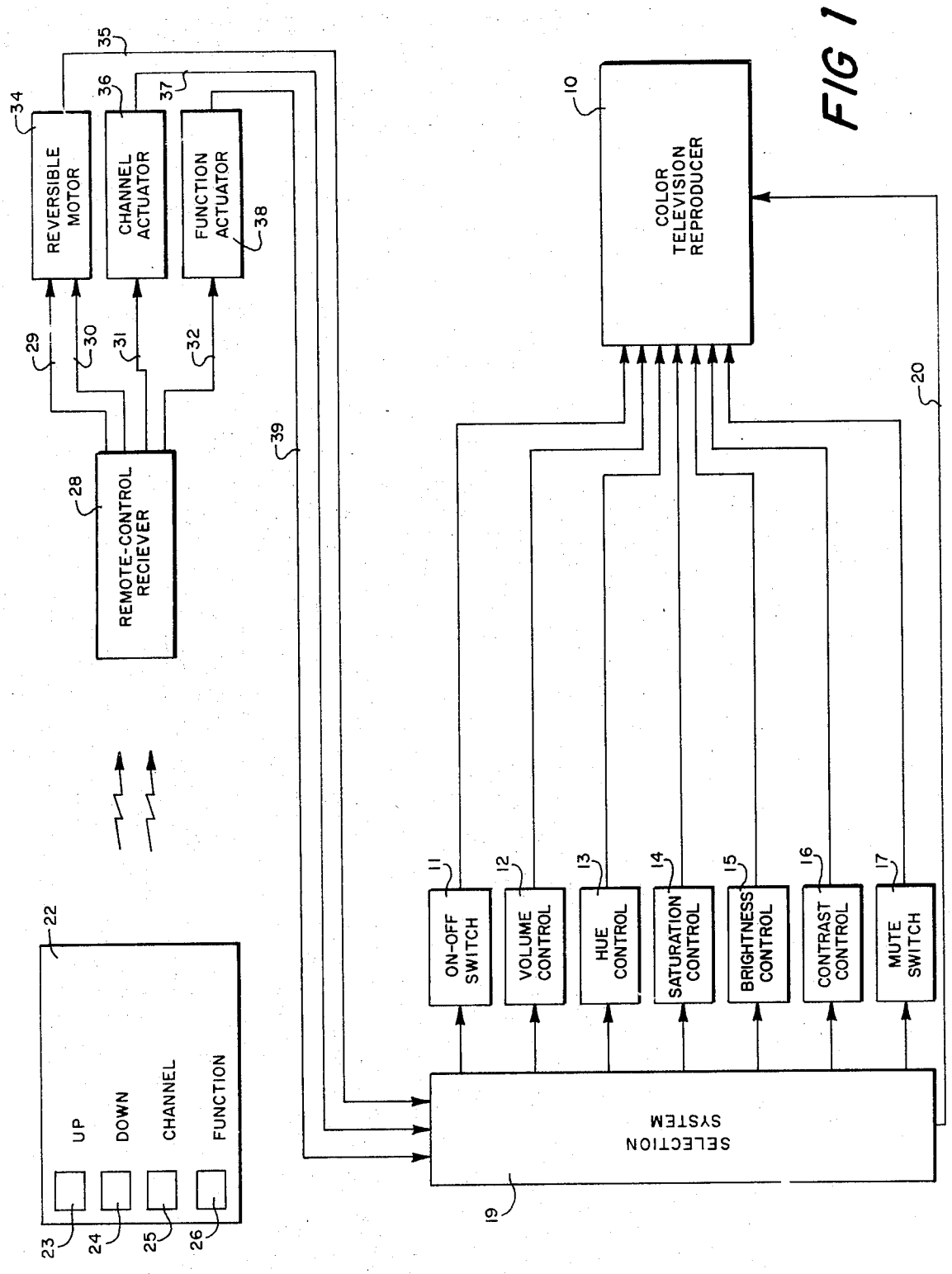

COLOR TELEVISION REPRODUCER
10
ON-OFF SWITCH
11
VOLUME CONTROL
12
HUE CONTROL
13
SATURATION CONTROL
14
BRIGHTNESS CONTROL
15
CONTRAST CONTROL
16
MUTE SWITCH
17
SELECTION SYSTEM
19
20
REVERSIBLE MOTOR
34
CHANNEL ACTUATOR
36
FUNCTION ACTUATOR
38
35
37
29
30
31
32
REMOTE-CONTROL RECIEVER
28
39
22
UP
DOWN
CHANNEL
FUNCTION
23
24
25
26

FIG 1

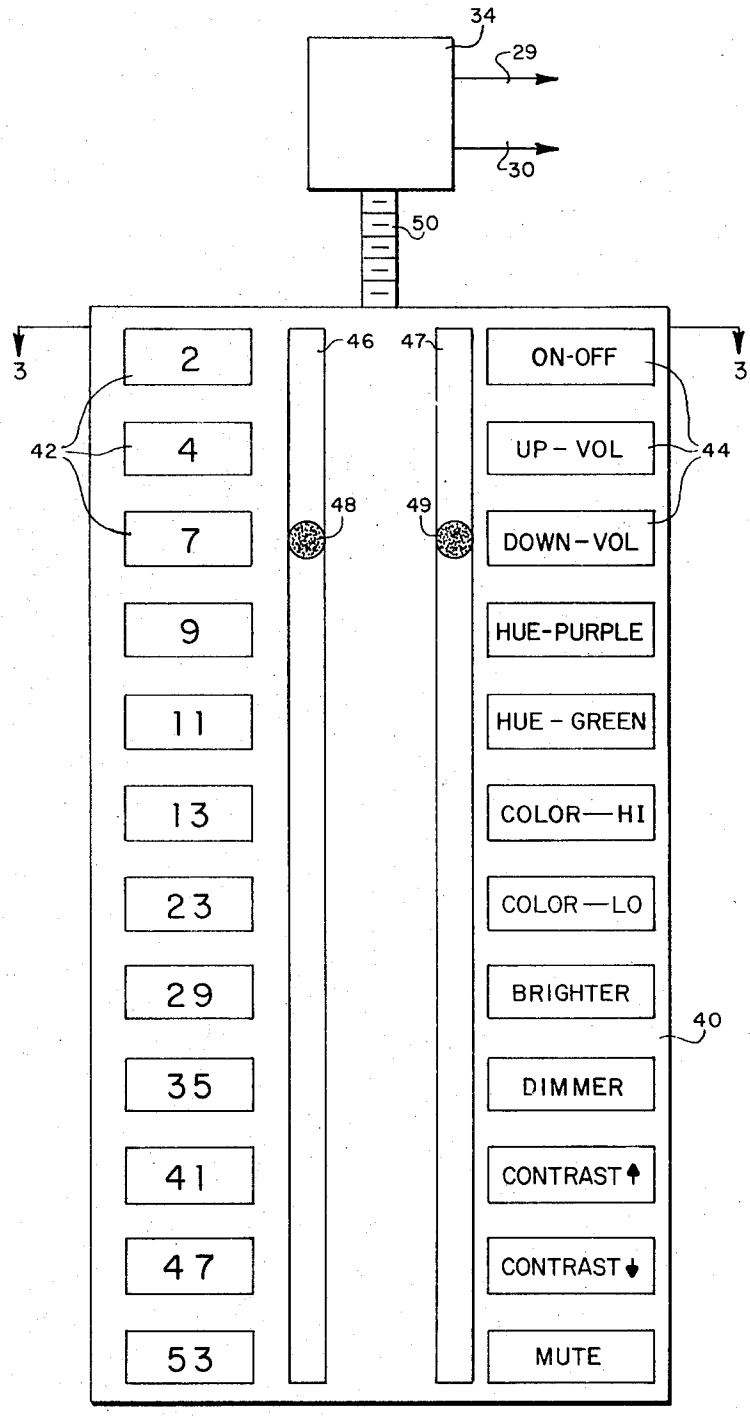

34
29
30
50
3
3
46
47
42
44
48
49
2
4
7
9
11
13
23
29
35
41
47
53
ON-OFF
UP - VOL
DOWN - VOL
HUE-PURPLE
HUE - GREEN
COLOR — HI
COLOR — LO
BRIGHTER
DIMMER
CONTRAST ↑
CONTRAST ↓
MUTE
40

FIG 2

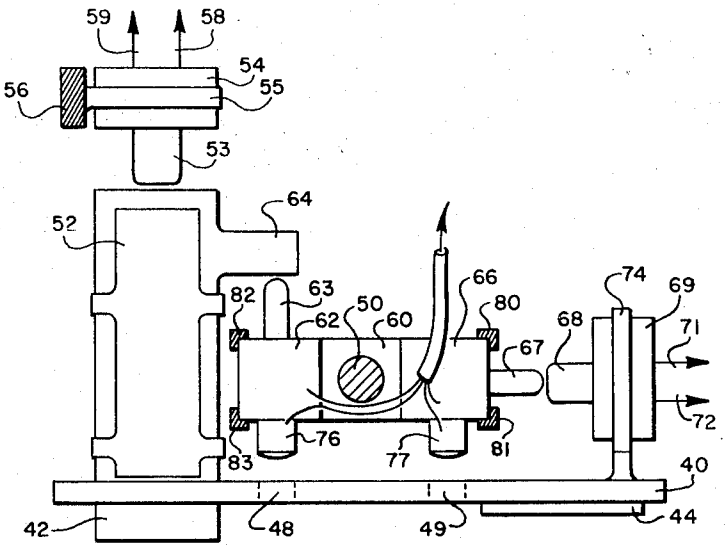


FIG 3

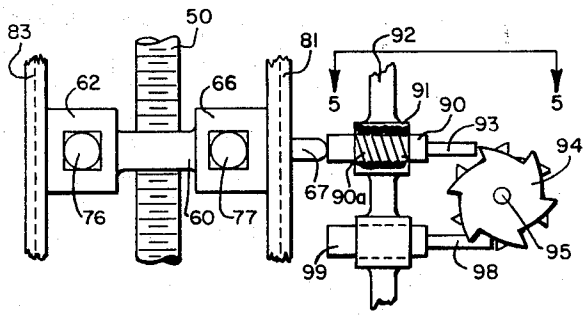


FIG 4

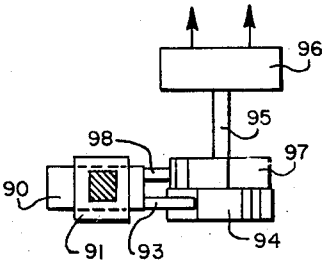


FIG 5

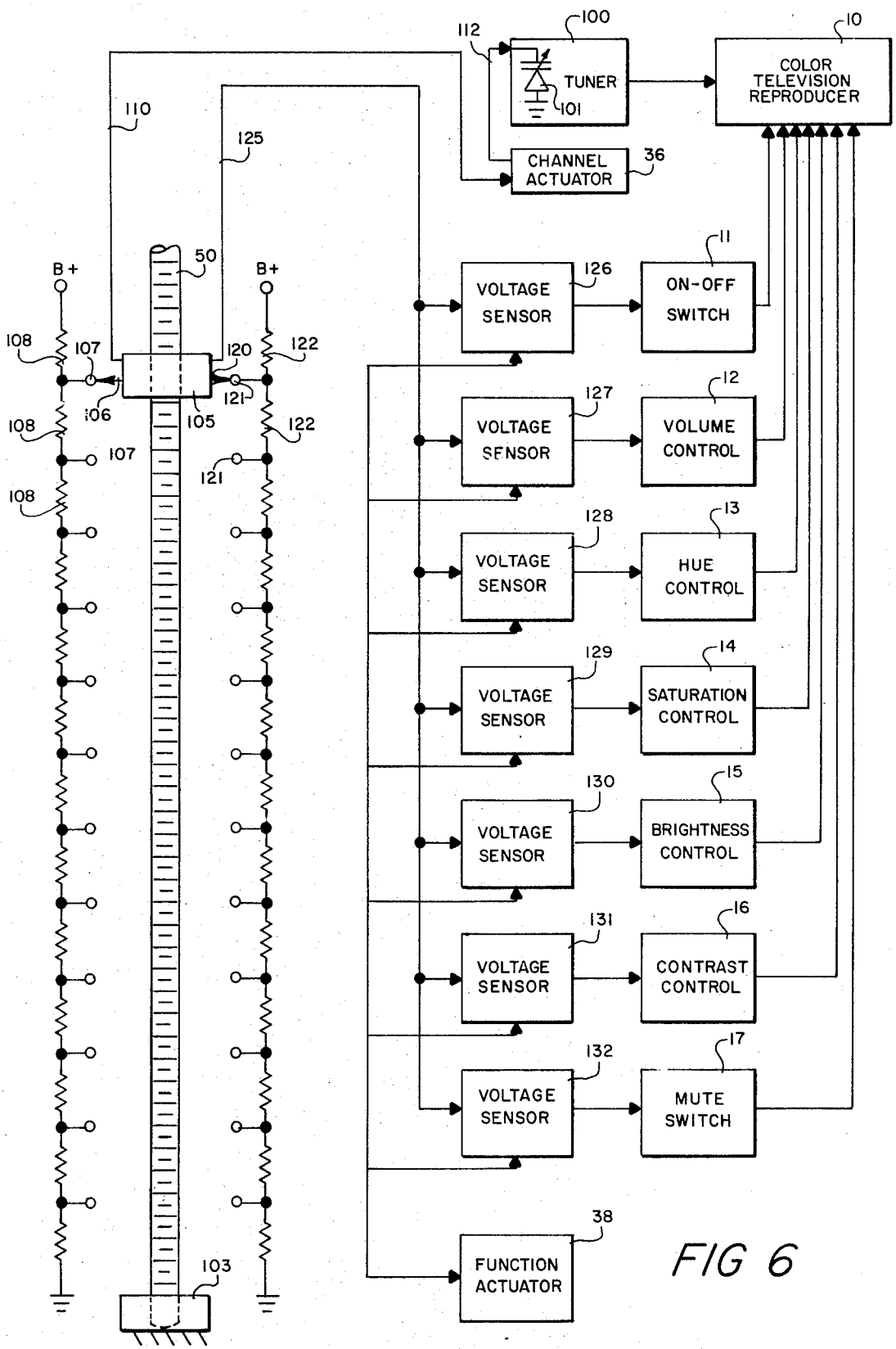

100
TUNER
101
112
10
COLOR TELEVISION REPRODUCER
110
125
CHANNEL ACTUATOR
36
50
B+
B+
108
107
120
122
106
121
105
VOLTAGE SENSOR
126
ON-OFF SWITCH
11
127
VOLUME CONTROL
12
128
HUE CONTROL
13
129
SATURATION CONTROL
14
130
BRIGHTNESS CONTROL
15
131
CONTRAST CONTROL
16
132
MUTE SWITCH
17
38
FUNCTION ACTUATOR
103

FIG 6

REMOTELY CONTROLLABLE TUNING SYSTEM FOR TELEVISION TUNERS

BACKGROUND OF THE INVENTION

The present invention pertains to television function-selection systems. More particularly, it relates to such systems which are particularly adapted for remote control.

Since first offered in a customer-acceptable form, the remote control of television receivers has proven to be a most attractive feature. Many viewers have enjoyed being able to change channels, mute the audio signal from the receiver, and adjust volume or the like directly from their viewing position remote from the receiver itself. While the remote like may be accomplished by a variety of different systems, including wires, light-operated photocells and radio signals, probably the most widely acclaimed television remote control system is that which was so successfully introduced by the assignee of the present application and which involved the use of ultrasonic signals. In that approach, manually-operable pushbuttons in a hand-held transmitter unit activate respective mechanical vibrators which, in turn, generate ultrasonic signals of respective different frequencies that are projected to the television receiver. At the receiver, those signals are segregated with respect to their different frequencies and utilized to develop respective different function-control signals. Typifying such a transmitter are the embodiments disclosed in U.S. Pat. No. 2,821,955 issued in the name of R. C. Ehlers et al., on Feb. 4, 1958. A highly advantageous receiver approach is that disclosed in U.S. Pat. No. 2,821,954 issued in the name of R. Adler also issued on Feb. 4, 1958.

Initially, it was customary to employ the remote control system for the purpose of changing channels, adjusting volume, turning the television receiver off and on and muting the audio, the latter especially to eliminate annoying commericals. Subsequently, other control functions were added. These included the control of such parameters as hue and saturation of color receiver displays. To accomplish the inclusion of these additional control functions without having to add a corresponding number of different control frequencies, one approach has been to use combinations of a basic set of control signals, transmitted either in certain sequences or coincidentally. In this way, for instance, four basic control signals may be utilized to control a larger number of specific different function. However, this has led to significant complexity at the receiver, while at the same time allowing for the possibility of greater confusion of the inexperienced user. Moreover, the recent expansion in usage of the many UHF channels, as compared to the original common usage in a given area of only a few VHF channels, has greatly increased the problems connected with selecting a desired channel, both manually at the receiver itself and remotely from a distant point.

OBJECTS OF THE INVENTION

It is, accordingly, a general object of the present invention to provide a new and improved television function-selection system which aids in alleviating the complexities and problems noted above.

It is another object of the present invention to provide a new and improved television function-selection system which enables the selection and control of a very large number of functions while requiring but a comparatively small number of command signals or command operations.

A further object of the present invention is to provide a new and improved television function-selection system in which a significant portion of the apparatus utilized to achieve selection from among the different available channels also is utilized, in an alternative mode, to control the operation or selection of a variety of other functions.

SUMMARY OF THE INVENTION

A television function-selection system constructed in accordance with the present invention includes a television receiver that has a plurality of different functions to be controlled. A corresponding plurality of operators individually are spaced successively apart with each being responsive to an immpulse for individually operating respective different ones of those functions. Included are means movable to selected different ones of a plurality of different positions individually corresponding to respective different ones of the operators and, at each position, selectively delivering the impulse to the corresponding operator. Finally, means respond to external command signals for selectively controlling movement of the movable means between the different positions as well as controlling delivery of the impulse to the operator.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of this invention which 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 conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements, and in which:

FIG. **1** is a block diagram of a remotely-controlled color television reproducer;

FIG. **2** is a front-elevational view of a function-control panel utilized in the system of FIG. **1**;

FIG. **3** is a cross-sectional view taken along the line **3—3** of FIG. **2**;

FIG. **4** is a fragmentary cross-sectional view taken of a portion of the apparatus in FIG. **2** with its front panel removed;

FIG. **5** is a fragmentary cross-sectional view taken along the lines **5—5** in FIG. **4**; and

FIG. **6** is a schematic diagram of an arrangement alternative to the electro-mechanical approach particularized in FIGS. **3–5.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. **1** illustrates an exemplary overall arrangement that includes a remotely-controlled television receiver. Thus, a color television reproducer **10** is shown as having means to control or adjust a variety of different functions. These include an on/off switch **11,** a volume control **12,** a hue control **13,** a saturation control **14,** a brightness control **15,** a contrast control **16** and a mute switch **17.** Each of the names of these controls is used herein in accordance with its ordinary terminology. For example, the hue control determines the emphasis within the color spectra which generally runs

from purple to green. Saturation, on the other hand, refers to the level of color. Each of function controls **11–17** is individually governed by operation of a selection system **19.** In addition to control of the various functions specifically illustrated, selection system **19** also serves to control operation of the tuner (not shown) in reproducer **10** so as to select among the number of different television channels; the channel-selection signal is fed to reproducer **10** from selection system **19** over a path **20.**

To the extent desired, selection system **19** may include manually operable elements, such as pushbuttons or knobs, for directly controlling the different functions at the television receiver. In themselves, these different controls may be entirely conventional. In addition, however, the arrangement of FIG. **1** includes a remote control system capable of also selectively governing operation of the different control functions. To that end, a remote control transmitter **22** includes four different manually-operable pushbuttons **23, 24, 25** and **26** respectively labeled "up", "down", "channel" and "function." While any of the different modes of remote control signal transmission mentioned in the introduction may be utilized, as herein contemplated transmitter **22** is of the ultrasonic type such as disclosed in the Ehlers, et al., patent mentioned above. Correspondingly, the system includes a remote-control receiver **28** of the kind disclosed in the aforementioned Adler patent. Accordingly, receiver **28** segregates the four different signals of which transmitter **22** is capable of generating into a corresponding number of control paths **29, 30, 31** and **32.** The signals corresponding to up or down commands, obtained respectively by depressing pushbuttons **23** or **24,** are routed over corresponding paths **29** and **30** to a reversible motor **34;** depression of pushbutton **23** causes reversible motor **34** to rotate its shaft in one direction, while depression or actuation of pushbutton **24** causes motor **34** to rotate its shaft in the opposite direction. That shaft movement is fed into selection system **19** as indicated by a path **35.** Depression of channel pushbutton **25** results in energization of a channel actuator **36** which, in turn, is coupled to selection system **19** over a path **37.** Finally, actuation of function pushbutton **26** results in the energization of a function actuator **38** which governs certain operations within selection system **19** by way of a path **39.**

As labeled in FIG. **1,** channel actuation has for convenience been separated from what is denominated as function actuation. It is to be understood, however, that the selection from among different channels is also a matter of one variety of function selection. In any event, the overall manner of operation of the system of FIG. **1** is such that pushbutton **23** and **24** effect operation of motor **34** in a manner to enable the selection of any one of a possible number of different channels. When the desired channel has been enabled, subsequent depression of pushbutton **25** then effects the actual selection of that channel for reception by the television receiver. Alternatively, or at the same time, pushbuttons **23** or **24** are utilized again to operate reversible motor **34** in a manner so as to enable the selection of any one of the several different available ones of controls **11–17.** Subsequently, when the desired control has thus been enabled, pushbutton **26** is depressed as a result of which function actuator **38** causes that particular specific function to be operated or controlled. The manner in which these different selections may be achieved in practice will become more apparent following discussion of the subsequent figures.

In the United States, standard television stations are each assigned a specific one of the different available channels which are numbered from 2 to 83. Even in most large metropolitan areas, however, the number of satisfactorily-receivable stations usually is limited to about five or six. At most, the viewer is probably able to receive no more than about 12 stations. In any event, the number of stations which a viewer may receive in any given geographical area is much less than the maximum 82 channels assignable to broadcasters. Accordingly, a number of different television tuning systems have been produced which allow the user or installer to preset the television receiver so that, at least upon any kind of automatic or remote-controlled tuning, selections may be made from only among those channels which are utilized locally. This permits skipping the unused channels entirely.

However, present regulations in the United States complicate the design of such tuning systems. For example, the tuning mechanism must accommodate both UHF and VHF channels, and it must be approximately as easy to tune a UHF channel as it is to tune a VHF channel. With any repeated access system, there must be a minimum of six UHF channels. In the case of a single-control tuning system, there must be a total of at least 11 discrete channel positions, any of which is readily adjustable without tools, to receive any UHF channel.

The arrangement of FIG. **2** enables satisfaction of such requirements. It involves the use of a limited number of possible receiving channels which may be preset to the different local channels. In more detail, that which is shown in FIG. **2** includes a selector panel **40** that desirably is mounted upon the external front surface of the cabinet which houses reproducer **10.** Projecting through panel **40** are a plurality of pushbuttons **42** respectively designated by the individual different channel numbers to which each is assigned for purposes of selection. Without more, these different pushbuttons may be manually depressed just for that purpose as in any other conventional pushbutton tuning mechanism. For example, depression of the pushbuttons **42** designated by the numeral four causes the tuner associated with reproducer **10** to select the station on channel four for viewing and listening. Thus, and in a manner well known as such, each different pushbutton permits a respective different frequency-selective element to become operative within the television tuner. Typically, that element might be a resistor controlling a varactor, a capacitor or an inductor.

Also spaced along panel **40,** in this case in a column parallel to that formed by pushbuttons **42,** are a series of labels **44** each of which includes a designation of a respective different operational parameter to be controlled in the television receiver. In themselves, the different designations are self-explanatory. It may be noted, however, that in some cases, such as an on/off and mute, a single label is assigned. In others, such as volume or hue, one label indicates control of that function in one direction while an immediately adjacent label designates control of that function in the opposite direction.

Also included in panel **40** are a pair of elongated translucent windows **46** and **47** respectively aligned alongside the column of pushbuttons **42** and the col-

umn of labels **44.** At a particular position within each of the windows are respective light spots **48** and **49** which serve to indicate the corresponding functions enabled for selection at any given light. That is, the position of light spots **48** and **49** as drawn in FIG. **2** indicate to the viewer, who may be located a number of feet from the television receiver, that channel seven is enabled for selection by use of his remote control transmitter or that, alternatively, use of his remote control transmitter will enable him to reduce the volume. Also shown in FIG. **2** is reversible motor **34** the shaft of which depends downwardly from the motor generally between the respective columns of pushbuttons **42** and labels **44** as well as between windows **46** and **47.** In this particular embodiment, the motor shaft is in the form of a lead screw **50.**

Referring to FIG. **3** for more detail, pushbutton **42** is movably carried within a slide **52** affixed to the back side of panel **40.** Depression of the illustrated one of pushbuttons **42** results in the corresponding depression of the plunger **53** of an on-off switch **54** mounted in a bracket **55** affixed to a stationary support **56.** A pair of leads **58** and **50** are electrically connected upon depression of plunger **53.** Accordingly, leads **58** and **59** when electrically connected serve to complete an electrical circuit for the appropriate frequency-determining element in the television tuner. For example, a simple resistance may be connected in a varactor energization network to change the capacitance of the varactor to the desired frequency-determining value.

Driven along lead screw **50** is a nut **60** on one side of which is affixed an operator in the form of a solenoid **62** having an armature **63.** Upon energization of solenoid **62,** plunger **63** is driven rearwardly of panel **40** so as to urge against a lug **64,** projecting laterally from the rear end portion of pushbutton **42,** and thereby electromechanically depress pushbutton **42** against plunger **53.** That is, plunger **53** of switch **54** may be operated either by manual depression of pushbutton **42** or by energization of solenoid **62.**

Affixed to the opposite side of nut **60** is another solenoid **66** from which projects an armature **67.** As shown, armature **67** is aligned with the plunger **68** of a switch **69** which in this case serves the function of on-off switch **11** in FIG. **1.** That is, each successive depression of plunger **68** alternatively opens and closes the connection between a pair of leads **71** and **72** in order to govern that function of reproducer **10.** Switch **69** is mounted from the back side of panel **40** by a bracket **74.** Another switch, identical to switch **69,** is included in back of the mute position at the bottom of panel **40** and opposite the channel designated **53.** Thus, when lead screw **50** is rotated so as to move solenoid **66** to the lower-most position in back of panel **40,** energization of solenoid **66** serves instead to control the mute function. At the same time, alternative or simultaneous energization of solenoid **62** would effect depression of the pushbutton designated **53** so that channel would be selected.

Mounted on the casing of solenoid **62** and facing window **48** is an indicator lamp **76.** Similarly mounted on solenoid **66** and facing window **49** is another indicator lamp **77.** When desired, only one window and the corresponding indicator lamp are all that is necessary. As illustrated, however, the use of the two different light spots **48** and **49** assists the viewer in determining from a distance the parameter or function enabled for control.

For the purpose of constraining rotation of the assembly including nut **60** and solenoids **62** and **66,** and thus causing that assembly to traverse lead screw **50** as the latter rotates, angle-shaped guide rails **80, 81, 82** and **83** are located at the respective four corners of the assembly. While guide rails **80–83** might also serve as electrical connective elements, in this case the leads for energizing the indicator lights and the solenoids are in the form of a simple flexible cable.

In the particularized example of FIG. **4,** motor **34** has been energized and the nut and solenoid assembly is positioned adjacent to the label designating a change of volume in the up, or louder direction. In this case, plunger **67** is aligned with an anvil **90** slidably received in a journal **91** carried by a rigid support **92;** anvil **90** is biased toward plunger **67** by a spring **90a.** Projecting outwardly from anvil **90** is a flexible stem **93** which serves in operation to drive an opposed cog in a ratchet wheel **94** mounted on the shaft **95** of a potentiometer **96** as shown in FIG. **5.** Thus, each energization of solenoid **66** causes plunger **67** to strike anvil **90** and thus move stem **93** to effect rotation of shaft **95** by one ratchet notch. In turn, each such advance in rotation of the ratchet wheel results in a stepped increase in volume by a preselected amount. Also affixed to shaft **95** is a second ratchet wheel **97** which has its cogs oriented for rotation of the shaft in the opposite direction by means of a stem **98** affixed to an anvil **99** located in the next position below anvil **90.** That is, in order to lower the volume, it is only necessary to command motor **34** to move the nut and solenoid assembly to the next lower position adjacent the label designating volume down, whereupon energization of solenoid **66** causes the volume to be lowered one step. Of course, ratchet wheels **94** and **97** are each mounted upon or coupled to shaft **95** by a suitable ratchet clutch so that either wheel is able to drive the shaft in its respective direction of control. Similar ratchet wheel assemblies are located at each of the other function positions that require a rotary action.

Of course, different mechanical arrangements may be utilized to achieve the specific operations illustrated. For example, a geneva drive may be substituted for lead screw **50.** In that case, movement of solenoids **62** and **66** will occur in discrete steps from one position to the next. As an added feature, shaft **95,** and the analogous ratchet wheel shafts at others of the control positions, may extend through the front panel and have knobs affixed to permit manual control of the different functions. As an alternative to the use of rotary action in connection with any function, pushbutton switches may be used in association with stepping circuits.

Considering FIGS. **1** through **5** together, the overall principle of operation may be reviewed. Upon operation of transmitter **22,** by depression of either of pushbuttons **23** and **24,** motor **34** is energized in the appropriate direction to cause solenoid **62** and **66** effectively to scan, from one channel number to the next, while at the same time scanning the locations corresponding to the different other parameters that may be controlled. When the solenoids reach the position corresponding to the desired function the viewer simply presses either pushbutton **25** or pushbutton **26** to effect operation of the corresponding channel actuator **36** or function actuator **37.** That is, channel actuator **36** in this case is so-

lenoid **62,** while function actuator **38** is solenoid **66.** Thus, the same apparatus which is utilized to achieve selection from among the different available channels also is utilized to enable selection of any one of the other parameters to be controlled. As illustrated, 12 different parameters are each separately controllable in addition to channel selection in either an up or down direction. Yet, all this is accomplished with but four different remote control signals. Another advantage, as compared with some prior systems, is that actual channel selection occurs only after the channel has been enabled; that is, there is no need to sequence through a number of undesired successive channels to reach a desired channel.

In contrast with the primarily electro-mechanical approach detailed in FIGS. **3–5,** FIG. **6** illustrates a system which is primarily electrical. In this case, reproducer **10** is again subject to both local and remote control of a plurality of functions **11–17** the same as in the case of FIG. **1.** Its tuner **100** is specifically of the type in which a varactor **101** is the primary frequency-determining element.

Varactor-controlled tuners are now commerically available and require no operational description. It will, therefore, suffice merely to maintain that the varactor exhibits a change in capacitance in response to a change in the potential applied across its terminals. By using the varactor to establish the capacitance in a frequency-selective circuit, it thus becomes necessary only to adjust the level of the applied potential in order to change the selected frequency.

Shaft **50,** in this case, is shown more completely as being journaled at its lower end in a stationary bearing **103.** A nut **105** is suitably constrained to ride up or down lead screw **50** as the latter is rotated. Projecting outwardly from one side of nut **105** is a tap or contact **106** movable by the nut to successively electrically wipe different ones of a plurality of fixed contacts **107.** Fixed contacts **107** are respectively connected to individual different junctions between a series of resistors **108** which together form a voltage divider connected between a source of positive potential B+ and ground. Movable contact **106** is connected by a lead **110** to channel actuator or switch **36** which, in turn, is operable to supply the potential on movable contact **106** to varactor **101** by way of a lead **112.**

In operation, pushbuttons **23** and **24** of transmitter **22** are used as before to command energization of reversible motor **34** and consequent rotation of shaft **50.** Each of fixed contacts **107** corresponds to a specifically assigned one of the respective different channels. Thus, movement of nut **105** in response to the up or down command signals serves to select from the appropriate one of fixed contacts **107** a channel-determining potential that may be fed to tuner **100** to control the tuning capacitance presented by varactor **101.** When nut **105** has been positioned to the desired channel position, subsequent depression of channel-selection pushbutton **25** effects switch closure in channel actuator **36** to feed the frequency-determining potential to the varactor. As illustrated in FIG. **6,** the voltage divider network has been simplified for convenience of illustration. In actual practice, where tuner **100** may have entirely separate portions for respective receiving channels in the VHF and UHF portions of the spectrum, it is contemplated that the system would also include a suitable arrangement, which may be as simple as a switch operated upon the passage of nut **105** past a selected position, to enable changing between VHF and UHF operation of the tuner.

A more sophisticated voltage-divider arrangement, which accommodates different voltage ranges required in view of unequal frequency spacings between different ones of the channels, is described and claimed in the copending application of Melvin C. Hendrickson, Ser. No. 331,921, filed Feb. 12, 1973 (1,728), and assigned to the same assignee as the present application. Also featured is a means for achieving a fine-tuning voltlage adjustment without altering the voltage distribution within the divider itself. Such features of that application may be adapted to the embodiment of FIG. **6.**

Selection from among the different other control parameters is achieved in an analogous matter. Thus, another movable contact **120** is carried by nut **105** in a location to wipe successively across a plurality of fixed contacts **121.** Contacts **121** are individually connected to respective different junctions between a corresponding plurality of resistors **122** again connected in series to form a voltage divider which extends between B+ and ground. In this case, the potential derived by movable contact **120** at any given time is fed by a lead **125** to each of a plurality of voltage sensors **126—132** associated respectively with function controls **11–17.** As will be apparent, each voltage sensor responds only to a corresponding level of voltage on the voltage divider selected by movable contact **120.** Each of sensors **126–136** also is enabled to operate only in response to energization of function actuator **38.** Thus, the only one of voltage sensors **126–132** which will operate at any given time is the one corresponding to the input voltage level selected by movable contact **120** from the voltage divider composed of resistors **122.** Moreover, that particular voltage sensor is only armed by the appropriate voltage until such time as pushbutton **26** is depressed so as to energize actuator **38.** When both armed and enabled to operate, the particular voltage sensor fires or operates the associated control function. Alternatively, any one or more of sensors **126–132** may be chosen so as to operate automatically upon application of the proper voltage but without enabling by actuator **38.**

A variety of known control circuits are available which may be utilized in the place of any of voltage sensors **126–132** or controls **11–17.** The sensors need only function as gates that have upper and lower thresholds. In principle, the controls may be stepping or ramp circuits that respond to the gate voltage. A variety of voltage or current responsive control circuits are known that may be employed to adjust a resistance or capacitance in a variable gain stage for governing the function being controlled.

Whatever specific approach is followed as to any of the different details and alternatives, it will be observed that the system described and illustrated enables control of a large multiplicity of functions with but a few control signals. At the same time, the addressing is such as to avoid any necessity of sequencing through different successive functions. Moreover, the very same system used for the purpose of addressing different channels to be selected also may be utilized to address a number of different control functions or parameters. In all cases, the general approach affords a wide flexibility of design to the manufacturer. That is, the manner of

construction and assembly of the different parts in the electro-mechanical version detailed in FIGS. 3–5 may vary widely in correspondence with the economics of component and fabrication costs. Analogously, the primarily electrical approach of FIG. 6 also affords a great degree of flexibility. As one example, the linear motion of the lead screw and its nut as illustrated may readily be replaced by a rotary switch. Presently available techniques permit printing of the different fixed contacts in an annular array for access by a circularly movable contact. Resistors **108** and **122** may be printed and interconnected directly on the substrate carrying the fixed contacts. An example of such an arrangement is included in the aforementioned Hendrickson application.

While particular embodiments of the present invention have been shown and described, it is apparent that changes and modifications may be made therein without departing from the invention in its broader aspects. The aim of the appended claims, therefore, is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A television function-selection system comprising:

a television receiver having a plurality of different functions to be controlled;

a corresponding plurality of operators individually spaced successively apart and each responsive to an impulse for individually operating respective different ones of said functions;

movable means, including a selectively rotatable lead screw and a nut movable along said lead screw upon rotation thereof, movable to selected different ones of a plurality of different positions individually corresponding to respective different ones of said operators and, at each position, selectively delivering said impulse to the corresponding operator;

and means responsive to external command signals for selectively controlling movement of said movable means between said different positions and delivery of said impulse to said operators.

2. A system as defined in claim **1** further includes an actuator carried by said lead screw for movement to said different positions to deliver said impulse.

3. A system as defined in claim **1** in which at least one of said operators is a movement responsive switch, and in which said movable means includes a solenoid having a plunger that moves to actuate said switch.

4. A system as defined in claim **3** which further includes means for also manually actuating said switch.

5. A system as defined in claim **1** in which at least one of said operators includes a rotatable shaft having a shaft rotator, and in which said movable means includes a solenoid having an armature that moves to actuate said shaft rotator.

6. A system as defined in claim **5** in which movement of said movable means to one of said positions enables actuation of said shaft rotator in one direction and movement of said movable means to another of said positions enables actuation of said shaft rotator in the opposite direction.

7. A system as defined in claim **1** in which said operators individually include respective different ones of a plurality of voltage-responsive sensors and in which said movable means includes means for developing a plurality of different voltages in correspondence with respective different ones of said positions and, at each different position, supplying the corresponding voltage to the respective sensor.

8. A system as defined in claim **1** in which said operators individually include respective different ones of a plurality of voltage-responsive sensors, in which said system includes a voltage divider, and in which said movable means includes a tap movable among different positions on said divider to feed respective different voltages to said sensors.

9. A system as defined in claim **8** in which said system further includes means separate from said movable means and said voltage divider for enabling operation of said sensors.

10. A system as defined in claim **1** which further includes a scale distributed in correspondence with said different positions and in which an indicator is moved along said scale by said movable means to indicate the one of said operators to which said impulse is delivered.

11. A system as defined in claim **1** in which said movable means includes function-selection means for selectively controlling movement of said movable means to the different ones of said positions and actuation-selection means for selectively controlling the delivery of said impulse to the one of said operators corresponding to the selected one of said positions.

12. A system as defined in claim **1** in which said movable means includes means for automatically enabling operation of said operator to said impulse upon location of said movable means at the corresponding position.

13. A system as defined in claim **1** in which said operators are distributed into two groups in each of which a respective plurality of the operators individually are spaced successively apart, in which each of said different positions individually corresponds to a respective one operator in each of said groups, and which includes means for selectively delivering an impulse to either one of the pair of operators corresponding to the selected one of said positions.

14. A system as defined in claim **13** in which one of said two groups of operators functions to select channels of television channels and the other of said two groups of operators functions to control reproduction qualities of said television receiver.

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