

[54] KEYBOARD ACTUATED LIGHTING INSTRUMENT

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84/464, 84/470

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[58] Field of Search 240/10 R, 10 T;
40/130 R, 130 N, 130 L, 132 R, 132 C, 132
D, 132 E; 84/464, 470, 478

[56] References Cited

UNITED STATES PATENTS

3,196,732	7/1965	Conner	84/478
3,228,278	1/1966	Wortman	84/464
3,346,732	10/1967	Crusius	240/10 R X
3,425,146	2/1969	Winstanley	240/10 R X
3,611,603	10/1971	Gesner III	240/10 R X
1,886,341	11/1932	Kirk	40/130 N
3,156,990	11/1964	Dock	40/132 D

Primary Examiner—Joseph F. Peters

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[57] ABSTRACT

A keyboard actuated lighting instrument, generally

drum shaped, includes a circular shaped translucent member. A first cylindrical housing has one end thereof affixed to the translucent member. A second cylindrical housing, having a radius smaller than that of the first housing, is oriented concentric with the first housing so as to abut with the translucent member. A first plurality of partitioning members are affixed to and radially extend from the second housing to the first housing, the partitioning members having ends thereof in abutment with the translucent member. A first plurality of different colored lamps are housed in the annular ring formed by the housings, one and one only of the lamps being housed, respectively, in each sector formed by the partitioning members. A second plurality of different colored lamps are oriented within the second housing. A circular wall is coupled to the opposite end of the first housing. Each one of a first plurality of switches, corresponding in number to the first plurality of lamps, is coupled to a single different lamp. Each one of a second plurality of switches, corresponding in number to the second plurality of lamps, is coupled to a different single lamp. Suitable means couple the first and second pluralities of switches to the exterior of the circular wall. Provision is made to electrically couple a potential source to the lamps and switches.

3 Claims, 6 Drawing Figures

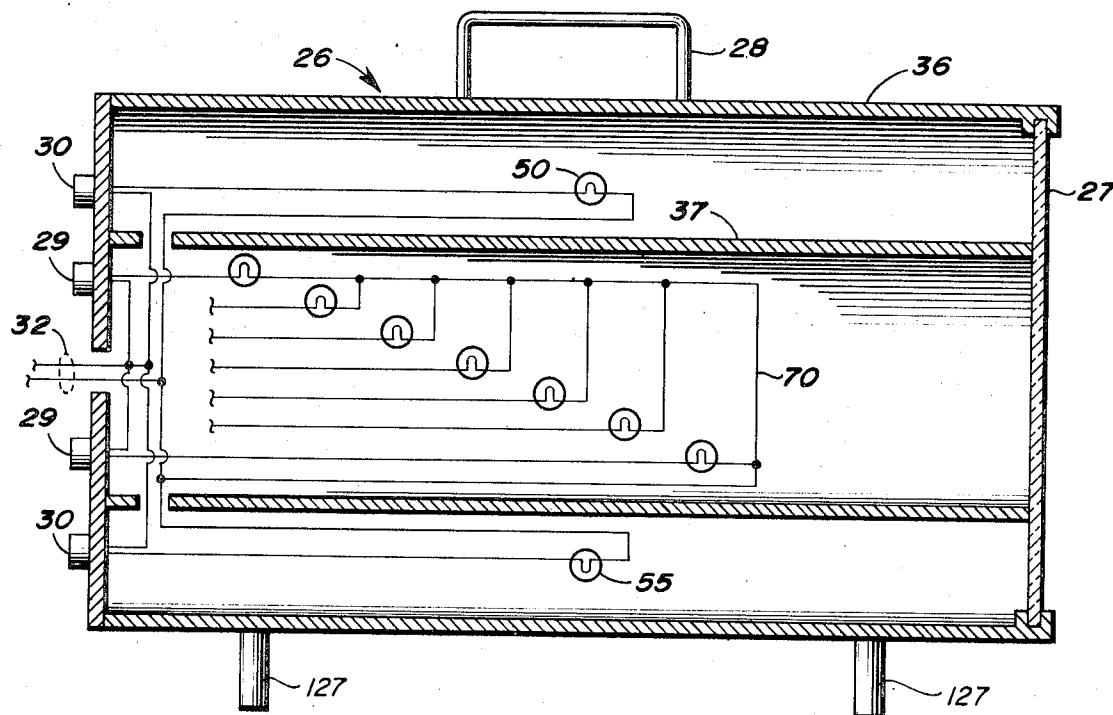


Fig. 1

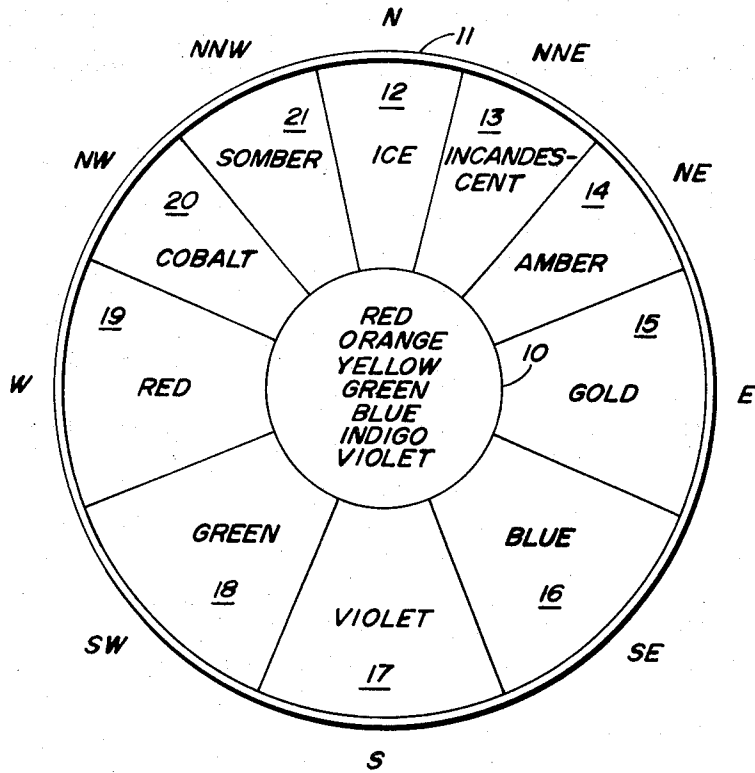


Fig. 2

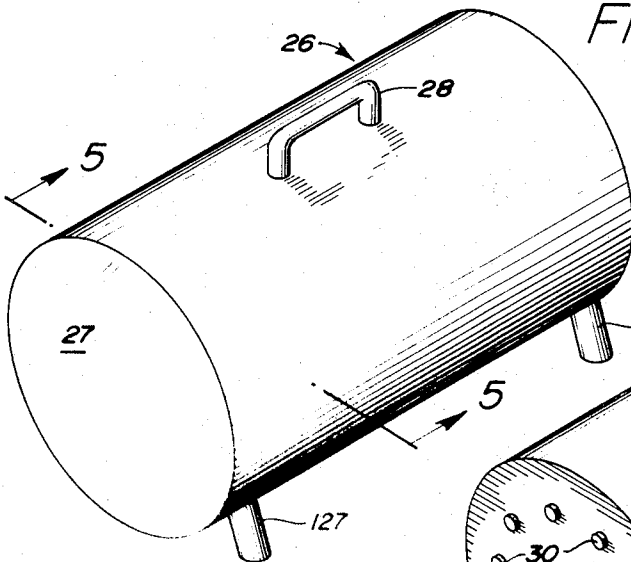
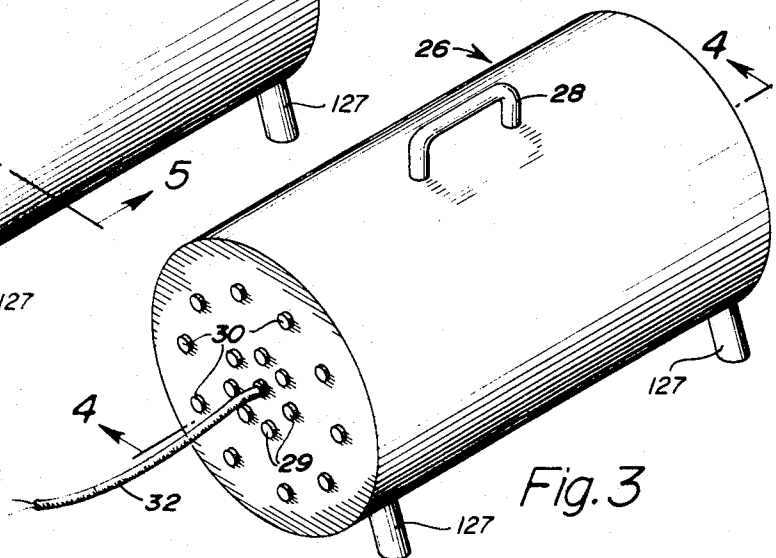
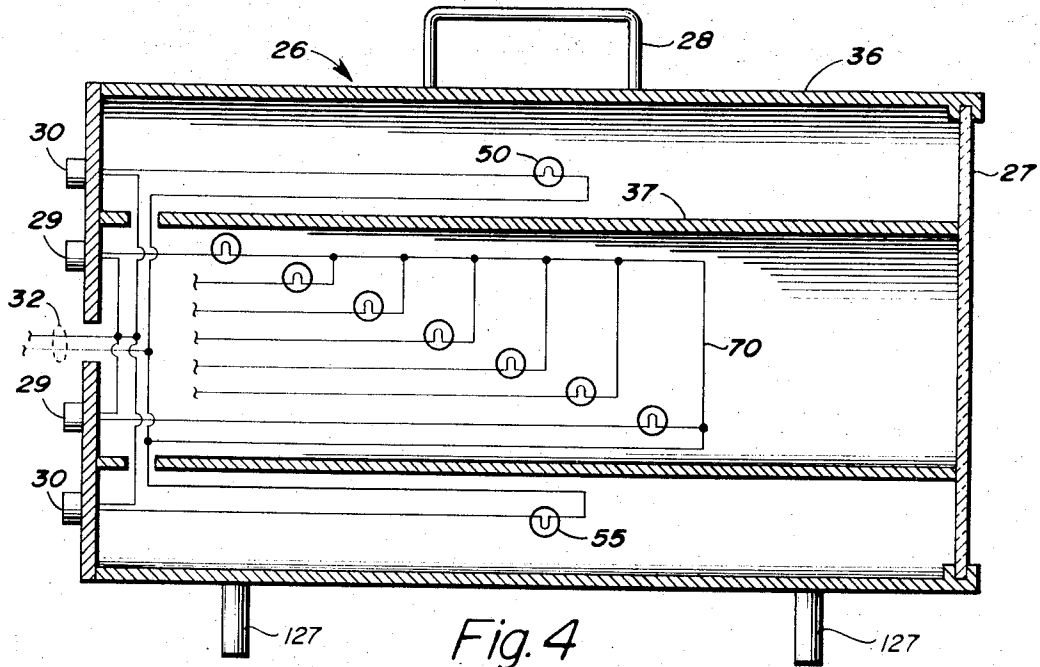
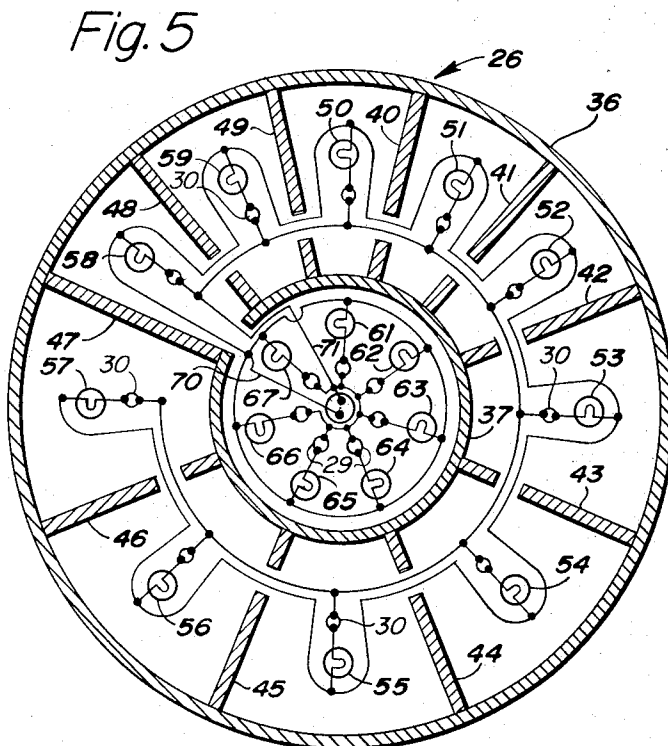
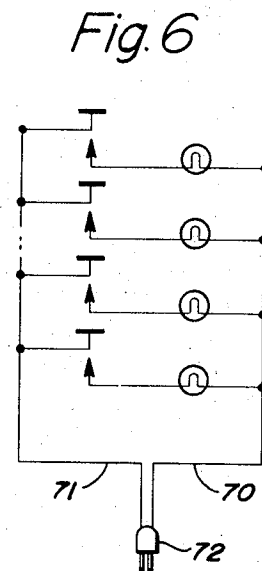


Fig. 3



KEYBOARD ACTUATED LIGHTING INSTRUMENT

BACKGROUND OF THE INVENTION

This invention relates to a lighting instrument which is operated by switches, and more particularly, to a panel keyboard operated lighting instrument. Accordingly, the general objects of this invention are to provide new and improved devices of such character.

The invention relates to a panel keyboard actuated lighting instrument which can be operated by an operator having a musical background so as to play the lighting instrument in conjunction with the musical lighting score.

The invention, though ostensibly relating to the field of color optics, functions in a language-music-color synthesis which is authored and created by the applicant in a book entitled "The Tonaligua-Concordophone System of Color-Music Composition", published and copyrighted in 1972. Description is also provided in a book authored by the applicant, entitled "Tonachromaton-Creating Electronic Color-Chord Patterns through Language", to be published in 1973. A "Tonaligua Chordmaster Set" was patented by the applicant July 27, 1965 as U.S. Pat. No. 3,196,732.

The present invention constitutes an apparatus for effecting the color composition aspect of the foregoing system. In view of its orientation in a multimedia synthesis, a brief description of the Tonaligua Concordophone system is described hereinbelow.

The Tonaligua Concordophone system is the result of three concepts: (1) verbalization of chord intervals (Tonaligua), first described in the book "Tonaligua and the Inner Harp", published and copyrighted 1957 by the applicant, (2) establishment of a scientific basis for correlating color with harmony (Concordophone), and (3) creation of a system whereby the desired chord words (translated into their tonal equivalence) are retrieved from a source tape, fed into a second tape recorder, and then correlated with a color organ device (the Tonachromaton).

The language-color-music synthesis broadens the foundations of aesthetic self-expression and heightens aesthetic pleasure by correlating what is heard by the ear with what is seen by the eye. This system of harmony composition through "Tonachromaton" is geared to immediate conversion of expressive desires into tonal-color texture. This invention opens up the world of music to those unskilled in the art of composition and unable to play a keyboard musical instrument. By merely following a few simple instructions on how to identify Tonaligual notation (for tape retrieval purposes), as well as a few basic harmonic grammar rules, the art or music hobbyist has access to, and control of, a tremendous potential for multimedia expressiveness.

In the Tonaligua-Concordophone system, the individual thinks of color and then transposes this into letters and in numerical system. The choice of colors may stem from a poem, abstracting from a remembered experience, the colors suggested by that experience, or the color selections could be based on a particular mood the individual happens to be in when commencing the color-music creativity experience. Regardless of how the choice is made, each color selection is integrated with the tonal medium to a lexicon of chord pairs (in Tonaligual notation), each of which represents a certain color appearing in a metaphorical orientation of a "Harmony Star." This metaphorical orientation is embodied in the design of the Light Compass.

In the display structure of the Light Compass, the inner circle colors (red, orange, yellow, green, blue, indigo, and violet) reflect the interval relationship produced by the outer tones (soprano and bass) of a given chord pair. The colors of the outer segment reflect the interval relationship produced by the inner tones of a given chord pair.

Organization of color-harmony resources around the points of the compass have a three fold purpose: (1) to vivify the inner space environment of which creativity takes place by intensifying the spatial concentric orientation of the harmony star concept, (2) to make possible in this geographical orientation a greater potential for maximizing power to visualize images intensely, and (3) to further enhance the potential for artistic expressiveness by broadening the symbolic horizons. Thermal imagery, for example, is given an added dimension of reality by actuating the North Arc (ice) or the South Arc whose purple hues suggest warmth.

DESCRIPTION OF PRIOR ART

During the course of a preliminary novelty search, performed on behalf of the applicant, the following United States Patents were listed which may be of interest.

Inventor	U.S. Pat. No.	Issue Date
Kingsley	1,401,608	Dec. 27, 1921
Hector	1,432,553	Oct. 17, 1922
Vinageras	1,577,854	Mar. 23, 1926
Beers	1,669,117	May 8, 1928
Hector	1,728,860	Sept. 17, 1929
Craig	1,790,903	Feb. 3, 1931
Wortman	3,228,278	Jan. 11, 1966

Kingsley discloses illuminating attachments for keyboard musical instruments. His attachment has a set of switches with their actuators arranged in such position that they may be operated by a player while his fingers are on the keys of the piano or organ, and control circuits to suitable electric lamps of various colors. Kingsley's switch actuators are so located that they may be operated by the thumbs of the player while his fingers are on the keys. Thus, the player is able to flood the region around the piano with an illumination of a color and an intensity which he deems most appropriate for the particular tones, chords, motifs, or musical figures being produced at that time. Kingsley's lamps are located at the side of a stage and are intended and directed to illuminate the stage with various colors. Kingsley does not describe nor suggest an instrument which provides a feeling of motion of the various colors.

Hector, U.S. Pat. No. 1,432,553, discloses other lighting arrangements operated by a keyboard instrument. Hector discloses a series of lamps which may be provided with differently colored globes, or may be enclosed by polished, parabolic reflectors in front of which are placed colored screens of varying hues. The lamps are made to project on a dull white surface to project diffusion of the colors. Alternatively, the lamps may be made to project their colored lights on semi-opaque glass structures, such as a gothic church window. The light may be transmitted through semi-opaque glass, or the glass may be silvered and the light reflected. The order of the colors displayed by Hector's device are coupled with respect to the note scale of the keys of an instrument and are arranged to correspond

to the arrangement of colors in a double rainbow, the violets being at one end of the scale and the reds in the middle, and the colors displayed by the devices controlled by the bass notes being of darker hues than those corresponding to the treble notes. Hector, U.S. Pat. No. 1,432,553, does not suggest that a color "music" device which contains its own notes or can be controlled independently from musical notes.

Vinageras discloses lighting in a cylinder with the use of different colored projection lights and explanations of concentric arrangements. Vinageras discloses a "chromopiano", utilizing color notes composed and written in a manner analogous to that in which sequences and chords of musical notes are composed and written, with the intention of playing his "chromopiano" tuned in unison with the instruments of an orchestra in which the movement of the chromopiano is synchronized with the movement of a player piano, an organ, or a phonograph and to have them play together automatically. The source of light of Vinageras is an incandescent lamp or arc lamp wherein his chromopiano utilizes as many lamps as projection holes. Although Vinageras states that three color note chords can be produced, when chromomusical chords with more than three color notes are desired, chromopiano is provided with more projection holes and more keys.

In contradistinction, applicant's Concordophone Light Compass does not operate on a physico-mathematical basis as does the chromopiano of Vinageras. Applicant's system of sound-color correlation is entirely different, wherein his Light Compass is based on mathematical relationships which stem from the semitone motion differential existing in the movement of the tones of one chord to the tones of another. A given pattern of semi-tone motion between any two chords produces a specific color. The same color is produced, furthermore, in different pairs of chords providing the semitone motion differential remains identical. The mathematics of proportion and permutation underlie the various patterns of movement which are produced. Another feature which differentiates applicant's Light Compass from the Vinageras Chromopiano is that the latter instrument projects light by means of lenses, whereas, applicant's Light Compass produces various colored lights directly when buttons on the panel are depressed. Vinageras is based on the electromagnetic application of light, whereby the entire orientation as well as the color effect is different from that produced by applicant's light compass. Disadvantageously, the Vinageras device would require the performance thereof by a professional musician with considerable background in a science of color combinations, as contrasted with the application of applicant's Light Compass which can be readily played by a layman. Another distinction is that Vinageras is directed to illuminating stages, halls, etc. and, when tuned to unison with musical instruments, the combination of devices as used to present a finished work. On the other hand, applicant's Light Compass is a device for the layman to translate, into color patterns, the chord progressions he has composed in the Tonalingua-Concordophone system. In short, Vinageras' device is not integrated with a system of musical composition. Applicant's Concordophone Light Compass, on the other hand, forms an integral part of a system of composition designed primarily for the music or art hobby-

ist, as well as for the poetry enthusiast interested in creating colored chord interpretations of poetic works.

Beers discloses a circular arrangement of lights controlled by a stringed instrument, but does not suggest, however, an independently controlled lighting device.

Hector, U.S. Pat. No. 1,728,860, shows colored lights arranged in a circle or logarithmic spiral and controlled by a keyboard instrument means along with means for defusing the light, suggesting, however, that there may be instances where a silent keyboard (that is, without the agency of sound) is used to produce luminous displays.

Craig discloses a circular arrangement of colored lights shining on a translucent screen, but not key operated, the colors being activated by musical tones broadcast from a radio.

Wortman shows a circular arrangement of lights and panel surfaces for use therewith, which is activated by means of frequencies and amplitudes coming from a speaker system to show the various colors.

SUMMARY OF THE INVENTION

This invention relates to a new and improved keyboard actuated lighting instrument.

Another object of this invention is to provide a new and improved lighting instrument in which various colored lights are displayed upon a translucent member of such an instrument.

Still another object of this invention is to provide a new and improved lighting instrument in which various colored lights are displayed upon a translucent member of the instrument in two concentric circles, wherein the central circle can display various color lights and the outer annular ring has various colored lights displayed along various sectors thereof.

Yet another object of this invention is to provide a new and improved light instrument wherein the various colors and positions of the lights may be determined by the semi-tone motion differential existing in the movement of the tones of one chord to the tones of another, so that a given pattern of semi-tone motion between any two chords produces a specific color.

Still another object of this invention is to provide a new and improved keyboard actuated lighting instrument which can be readily played by a layman, who may translate into color patterns the chord progressions he has composed in the Tonalingua Concordophone system.

Still another object of this invention is to provide a novel light instrument which is attractive in appearance and suitable for use as furniture.

Another object of the present invention is to provide a new and improved light instrument which forms an integral part of a system of composition designed primarily for the music-art hobbyist as well as for the poetry enthusiast interested in creating color chord interpretations of poetic works.

A further object of this invention is to provide a novel cueing device to elicit responses in foreign language learning.

An additional object of this invention is to provide a novel instrument in its use as a means for experimenting with light color theory.

In accordance with one embodiment of this invention, the lighting instrument includes a circular shaped translucent member having a given radius r_1 . A first cylindrical housing, having the same radius, has one end

thereof affixed to the translucent member. A second cylindrical housing, having a smaller radius, is oriented concentric with the first housing, the second housing likewise abutting the translucent member. A first plurality of partitioning members are affixed to and radially extend from the second housing to the first housing, each of the partitioning members having an end thereof in abutment with the translucent member. A first plurality of different colored lamps, corresponding in number to the first plurality of partitioning members, are housed in the annular ring formed by the housings, a single one and one only of the first plurality of lamps being housed respectively in each sector formed by the partitioning members. A second plurality of different colored lamps are oriented within the second housing. A circular wall is coupled to the opposite end of the first housing. A first plurality of switches, which correspond in number to the first plurality of lamps are provided, whereby each of the switches is coupled to a single different lamp. A second plurality of switches, which correspond in number to the second plurality of lamps, are provided whereby each of the switches is coupled to a different single lamp. Means are provided for coupling the first and second pluralities of switches to the exterior of the circular wall. Means are provided for electrically coupling a suitable potential source to the lamps and the switches. In specific embodiments of the invention, the switches can be independently manually operable. In a preferred embodiment, the first plurality of colored lamps are oriented within sectors, such that the lamps oriented in one semi-circle with respect to the translucent member are of cooler colors with respect to the lamps oriented in the opposite semi-circle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram showing the color locations about a circular display including an inner circle having selectively operable colors and an outer annular ring including sectors having individual colors;

FIG. 2 is a front perspective view of one embodiment of applicant's invention;

FIG. 3 is a rear perspective view of the embodiment shown in FIG. 2;

FIG. 4 is a sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 3; and

FIG. 6 is an electrical diagram illustrating the connections between lamps and switches of an embodiment of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, there is shown a diagram of the various colors that are selectively actuated in accordance with this invention. The diagram includes a pair of concentric circles 10 and 11. The inner concentric circle can be selectively actuated to produce lights of various colors, such as red, orange, yellow, green, blue, indigo, and violet. The outer concentric ring formed by the concentric circles 10 and 11 are divided into a plurality of sectors 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21, as shown in FIG. 1, the numerals 12 through 21 being oriented clockwise within the drawing. The various sectors can be designated by various directional components, such as north, south, east, west, southwest, northeast, northwest, southeast, and north-

northeast and north-northwest, the upper sector 12 of the circle being located in the north direction and the lower portion being in the southerly direction. Separate colors are provided within the various sectors 12 through 21 as follows: Sector 12 in the north direction is ice, Sector 13 in the north-northeast direction is incandescent, Sector 14 in the northeast direction is amber, Sector 15 in the east direction is gold, Sector 16 in the southeast direction is blue, Sector 17 in the south direction is violet, Sector 18 in the southwest direction is green, Sector 19 in the west direction is red, Sector 20 in the northwest direction is cobalt, and Sector 21 in the north-northwest direction is somber.

It will be noted that the colors in FIG. 1 that are in the so-called northern hemisphere are of cool coloration, whereas, the colors in the southern hemisphere are of a warmer direction. Technically, the colors in the upper half of the semi-circle are cool and the lower semi-circle are warm. However, when viewing the color diagram of FIG. 1, it is helpful to consider the configuration as being one of global orientation whereby ice is located at the north pole. Various ones of the sectors 12 through 21 are selectively activated so that a single sector at a time is illuminated. This single sector can be illuminated simultaneously with one of the seven colors within the central circle 10.

In operation, various ones of the colors about the sectors 12 through 21 are activated simultaneously with various ones of the colors within the central circle 10 in a rhythmic fashion somewhat in the nature of music. The colors are activated independently of musical notes, per se, but are desirably activated in accordance with lighting "notes", so to speak.

FIG. 2 is a front perspective view of a lighting instrument 26 in accordance with one embodiment of this invention. The lighting instrument 26 is generally drum-like in shape and includes a translucent screen 27 which is circular in shape and is adapted to have light projected thereon in accordance with the color diagram of FIG. 1. The lighting instrument 26 may have suitable legs 127—127 at its base and a handle 28 at its top. A rear perspective view is also shown in FIG. 3.

Suitable switches 29—29 are provided at the rear of the lighting instrument 26 for actuating various different colored lamps within the central circle 10, whereas, other switches 30—30 are located at the rear of the instrument 26 for actuating various colored lamps between the concentric circles 10 and 11 to selectively actuate colored lamps, respectively, for the various sectors 12 through 21. The switches 29—29, 30—30 are mounted at the rear of the instrument 26, either as buttons directly connected to the panel, or on a separate adjacent panel keyboard. An electrical cable 32 is coupled to the lighting instrument 26.

Referring to FIG. 5, the lighting instrument 26 includes an outer cylindrical housing 36 and an inner concentric cylindrical housing 37. The cylindrical housing 36 and the concentric housing 37 have one end, respectively, coupled to a translucent screen 27, as shown in FIG. 4. The outer housing 36 is coupled to the inner housing 37 by various partitioning members 40, 41, 42, 43, 44, 45, 46, 47, 48, and 49 in such fashion as to form the various sectors 12 through 21 respectively. Within the various sectors 12 through 21 are located a plurality of various colored lamps 50, 51, 52, 53, 54, 55, 56, 57, 58, and 59, respectively. The colored lamps 50 through 59 are lamps for producing col-

ors ranging from ice through somber, respectively. A plurality of colored lamps 61, 62, 63, 64, 65, 66, and 67 for producing colors of red, orange, yellow, green, blue, indigo, and violet, respectively, are located within the inner concentric housing 37.

One terminal of each of the lamps 50 through 59, inclusive, and each of the lamps 61 through 67, inclusive, is coupled to a common lead 70, as shown in both FIGS. 5 and 6.

The other terminal of each of the lamps 50 through 59 are coupled to one side of their respective switches 30, 30 and shown in FIG. 3, and as indicated in FIG. 5. In a similar fashion, the other terminals of the lamps 61 through 67 respectively, are coupled to one terminal of the respective switches 29-29, respectively, as indicated at FIGS. 3 and 5.

The remaining terminals of all the switches 30-30 and 29-29 are coupled to a common lead 71 as indicated at FIGS. 5 and 6. The leads 70 and 71 are coupled via a cable 32 to an electrical plug 72. The electrical plug 72 can be coupled to an electrical potential source such as 110 volts a.c. or other desirable electrical source.

In operation, it will be noted that the light instrument 26 is portable. It can be carried by the handle 28 and placed upon a stage (not shown) by resting the instrument upon the pedestals 127 upon the floor of the stage. The player, may sit on a chair (not shown) and, after placing the electrical plug 72 into a suitable receptacle, he may selectively actuate the switches 29 and 30 in accordance with a suitable score which may be tied in with a musical arrangement. The player, in a timed sequence, suitably depresses various ones of the switches 29 and 30 to actuate various ones of the lamps within the sectors 12 through 21, respectively, and the lamps within the inner concentric housing 10, producing colors within the central housing ranging from red through violet and producing colors about the outer sectors ice through somber.

In addition to producing various colors selectively at the inner concentric circle 10, the player produces various colors selectively about the outer concentric circle, but, in addition to producing colors about the outer concentric circle, the player selectively actuates the colors at various selective positions about the outer concentric circle. Hence, the player is not merely illuminating, say, red, at the inner circle, and gold at the outer circle, but actually is producing the color red at the inner circle (if he so desires), but he produces the color gold at the easterly direction. Hence, in a sense, applicant's invention is a light compass in that colors are produced in accordance with desired orientations and not merely colors in a random directional manner. Hence, musically, the player may produce variations in colors, ranging in directions from east, to northwest, to south, southwest, west, southeast, etc. in a rhythmic manner.

Hence, with applicant's invention, a light instrument has been provided that produces not only a variation in colors, but a variation in directional patterns in that light is produced at various portions about different sectors of the translucent member, the translucent member operating somewhat as a screen or a light show.

Various modifications may be performed without departing from the spirit and scope of applicant's invention. For example, although push buttons are illustrated in FIG. 3, it will be apparent that other types of switches can be used, such as different types of keyboard devices. Simply, push buttons are an elemental form and a desired form of keyboard actuation. However, other types of keyboard actuated switches may be used, dependent upon the degree of ease upon which the player desires to actuate the various keys and depending upon the expense desired in providing a keyboard which is more biologically suitable, such as a keyboard which can be operated by two hands independently in the fashion of a dual typewriter setup. Other suggestions will become apparent to those skilled in the art.

What is claimed is:

1. A combination comprising

- a. a circular shaped translucent member having a radius r_1 ;
- b. a first cylindrical housing, having a radius r_1 , having one end thereof affixed to said translucent member;
- c. a second cylindrical housing, said second housing having a radius r_2 , wherein $r_2 < r_1$, and oriented concentric with said first housing, said second housing abutting said translucent member;
- d. a first plurality of partitioning members affixed to and radially extending from said second housing to said first housing, each of said partitioning members having an end thereof in abutment with said translucent member;
- e. a first plurality of different colored lamps, corresponding in number to said first plurality of partitioning members, housed in the annular ring formed by said housings, a single one and one only of said first plurality of lamps being housed, respectively, in each sector formed by said partitioning members;
- f. a second plurality of different colored lamps oriented within said second housing;
- g. a circular wall coupled to the opposite end of said first housing;
- h. a first plurality of switches corresponding in number to said first plurality of lamps, each of said switches being coupled to a single different lamp;
- i. a second plurality of switches corresponding in number to said second plurality of lamps, each of said switches being coupled to a different single lamp;
- j. means coupling said first and said second pluralities of switches to the exterior of said circular wall; and
- k. means for electrically coupling a potential source to said lamps and switches.

2. The combinations as recited in claim 1 wherein said switches are independently manually operable.

3. The combination as recited in claim 1 wherein the said first plurality of colored lamps are oriented within said sectors such that the lamps oriented in one semicircle, with respect to said translucent member, are of cool colors with respect to the lamps oriented in the opposite semicircle.

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