

Oct. 17, 1961

R. A. TOJZA ET AL

3,004,357

SELECTIVE SCORE DISPLAY

Filed March 18, 1959

2 Sheets-Sheet 1

FIG. 1

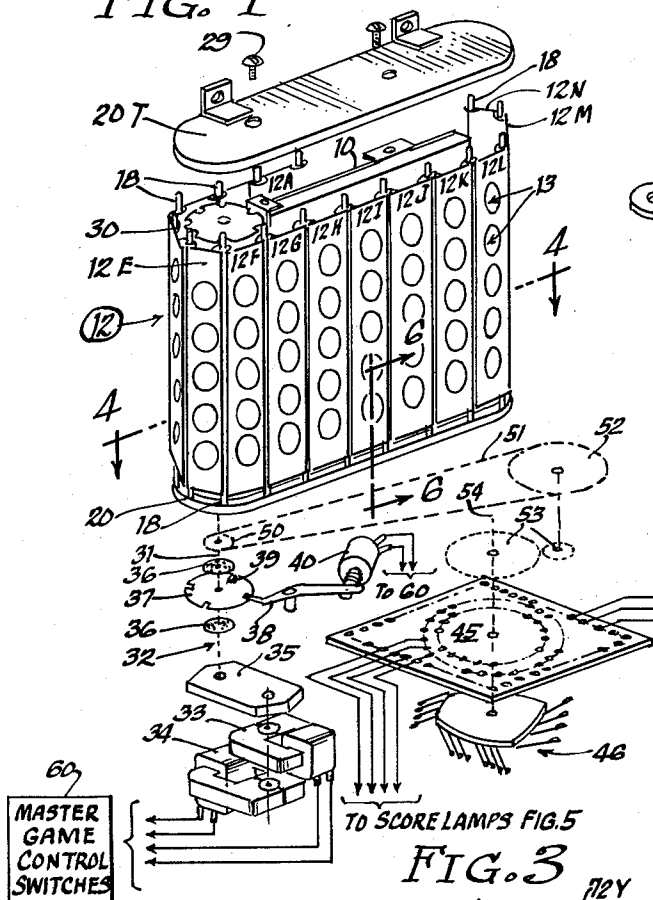


FIG. 2

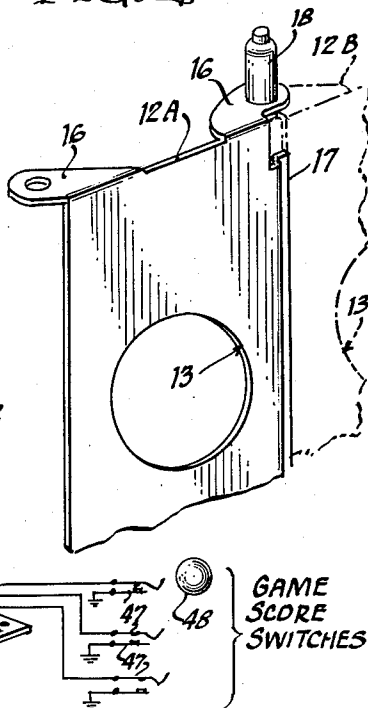


FIG. 3

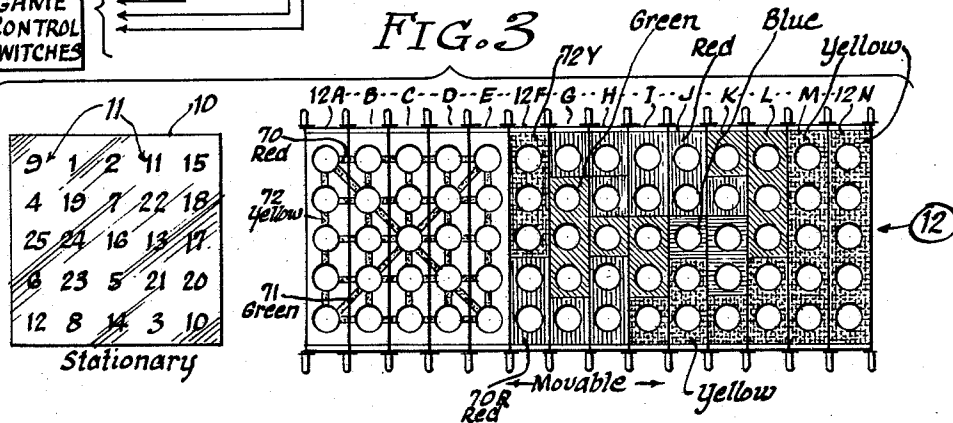
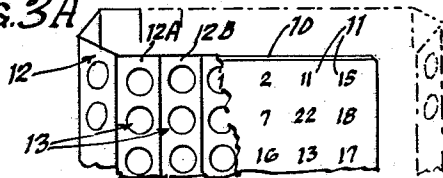


FIG. 3A



INVENTORS
Roman A. Tojza
BY Donald E. Hooker
Attorney

Oct. 17, 1961

R. A. TOJZA ET AL

3,004,357

SELECTIVE SCORE DISPLAY

Filed March 18, 1959

2 Sheets-Sheet 2

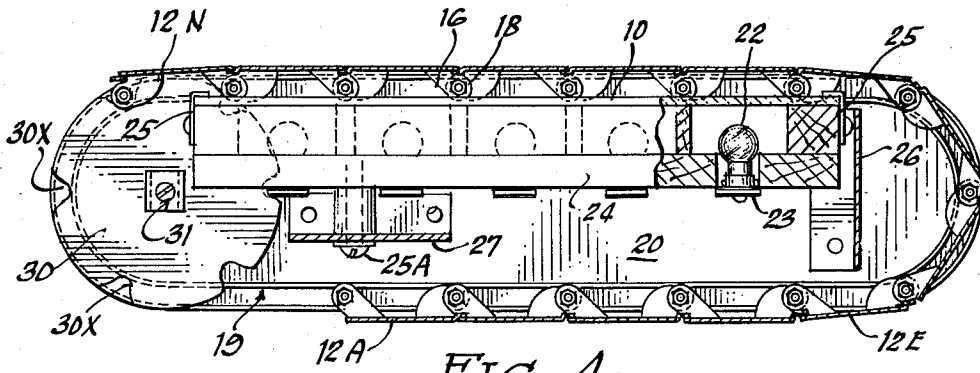


FIG. 4

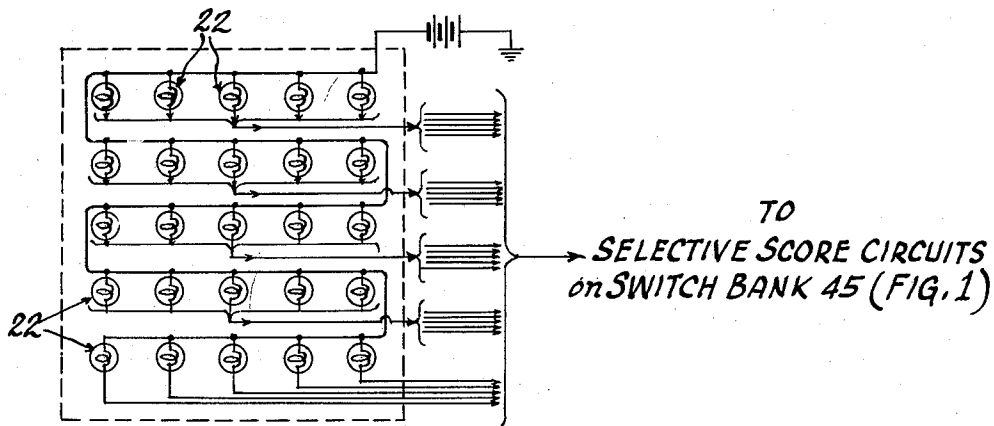


FIG. 5

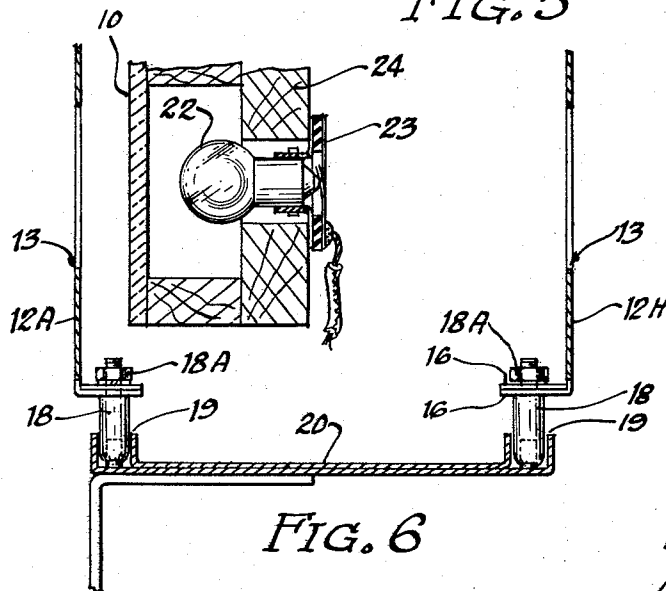


FIG. 6

INVENTORS,
Roman A. Tojza
BY Donald E. Hooker
Donald E. Hooker
Attorney

1

3,004,357

SELECTIVE SCORE DISPLAY

Roman A. Tojza, Chicago, and Donald Edward Hooker, Wilmette, Ill., assignors to Lion Manufacturing Corporation, Chicago, Ill., a corporation of Illinois
Filed Mar. 18, 1959, Ser. No. 800,299
6 Claims. (Cl. 40—28)

The principal object of the invention is the provision of an improved, selectively changeable display mechanism especially adapted for use in ball-rolling and like amusement apparatus, and particularly useful for displaying score indicia in conjunction with a "Bingo" type score card.

One of the features of the novel display mechanism is the provision of a shiftable display panel structure consisting of a plurality of articulated sub panels mounted to travel before a fixed display panel into and out of selected positions to change the so-called score card.

Other features relate to the construction and operation of the means for mounting the shiftable or travelling panels, and for moving and registering the same relative to the fixed display means, together with certain circuit changing means synchronously cooperative with the shiftable panel means; and a novel indicia matching system delineated on the individual sub panels, all of which will appear more fully as the following description proceeds in view of the annexed drawings, in which:

FIG. 1 is an exploded schematic of the novel display mechanism;

FIG. 2 is an enlarged fragmentary perspective detail of the articulated panel means;

FIG. 3 is a plan detail of one form of indicia layout used in the device of FIG. 1;

FIG. 3-A is a schematic diagram of the relationship between the travelling and fixed display panels;

FIG. 4 is a horizontal section taken along lines 4—4 of FIG. 1;

FIG. 5 is a circuit diagram;

FIG. 6 is an enlarged sectional fragment looking along lines 6—6 of FIG. 1.

The basic display-changing principle of operation of the device to be explained in view of FIG. 1 is illustrated in the diagram of FIG. 3-A, in which there is seen a stationary indicia or display panel 10 on which are individual score numbers 11 arranged in a certain critical pattern to be explained; and there is also a shiftable or travelling panel structure 12 provided with sight-openings 13 positioned in matching disposition so that by shifting the movable panel structure 12 in certain steps, different sub-panel sections 12A, 12B . . . etc. can be selectively aligned in register with the patternwise score data on the fixed panel for purposes more fully explained hereafter.

Referring to FIG. 1, the score display mechanism there depicted provides a shiftable panel structure 12 in the form of a series of articulated, narrow, elongated sub-panels 12A, 12B . . . 12N (FIG. 3 also) made of aluminum or other light material and each punched to provide a series of vertically spaced sight openings 13.

Each sub-panel is provided (FIG. 2) at its top and bottom margins with pierced offset lugs 16, and along at least one longitudinal margin with an offset lapping edge 17 adapted to lie behind an adjacent sub-panel and mask the gap therebetween.

Adjoining sub-panels 12A, 12B (FIG. 2) are pivotally interconnected or articulated by means of over-length bearing studs 18 seated in juxtaposed lugs 16 of adjoining sub-panels, and secured therein to serve as a combination pintle and glider in the manner shown in FIG. 6 wherein each stud 18 is secured in place by means of a nut 18A and extends into a narrow track channel 19 formed as part of a bottom plate 20 (FIG. 4 also), the

2

bearing studs 18 at the top of the panel structure riding in a like channel track formed in a top cover plate 20T (FIG. 1).

The fixed display panel 10 is a translucent square glass plate on which the score numbers 11 are screened so as to be brightly visible when illuminated from behind by an appertaining lamp 22 carried in a socket 23 seated in a back board 24, all contained within the screen ambit, it being understood that there is one lamp aligned behind each of the score numbers 11 in the glass panel, only one such lamp and socket being depicted, however, to simplify the view in FIG. 4.

The glass panel 10 and lamp board 24 are supported by lug and screw means 25, 25A, attached to bracket means 26, 27 (FIG. 4) on the bottom plate, said bracket means extending upwardly to the top plate so that the latter can be secured thereto by means of screws 29.

Means for travelling the articulated panel structure in its circuitous path include upper and lower sprocket discs 30 (FIGS. 1 and 4) fixed on shaft means 31 (depicted by dotted lines) projecting down through the bottom plate to engage with a motor drive shaft 32 (dotted lines) (FIG. 1), powered from reversely-driving twin motors 33, 34, through a reduction gear unit 35.

Slip-clutch disc means 36 drivingly cooperable with an index brake disc 37 is interposed between the screen shaft 31 and drive shaft 32, such that the latter can continue to turn when the indexing brake disc 37 is held fast by means of a brake pawl 38 engaging in any of a plurality of stopping notches 39 in the brake disc. The brake or indexing pawl 38 may be withdrawn by energization of release solenoid 40.

The sprocket discs 30, as seen in FIG. 4, have large stud notches 30X so positioned as to engage with the exposed shank portions of bearing studs 18, which are made over-length for this purpose (FIG. 6) so that when the brake pawl 38 is withdrawn, the sprocket discs 30 will be slowly turned to shift the panel assembly in one direction or the other, depending upon which of the reverse motors 33 or 34 is energized.

Circuit-changing rotary switch means comprising a bank of stationary contacts 45 (FIG. 1) and rotatable wiper contact means 46 is operable to connect and disconnect various score circuits between a plurality of game switches 47, adapted to be actuated (for instance by a ball 48 in a ball-rolling game) to the score lamp 22 in the array of FIG. 5.

Selector-switch wiper contacts 46 are rotated from screen shaft 31 to various circuit-changing positions in synchrony with positional changes of the screen structure through the agency of a sprocket-drive connection 50, 51, 52, 53 from said shaft to a shaft 54 on which wiper 46 is fixed. Thus, different ones of the lamps 22 will be connected or not with various score switch means 47 depending on the indexed position of the travelling screen and the correspondingly dependent selecting positions of the circuit-changing switching means 46.

The novel score display mechanism is especially adapted, but not limited, to use with a "Bingo" type score display "Card," such as displayed on the panel 10 in FIG. 3, wherein the score indicia or numbers are laid out in a special columnar array usually consisting of five vertical columns of said numbers 11 in each of which are five vertically spaced score numbers or values, so that a square array of five "lines" across and five "lines" down is achieved, as well as two additional special lines of five numbers each running diagonally from opposite corners of the array.

A winning score is usually achieved whenever "any five numbers in one straight line across, diagonally, or up and down" are achieved, in this case by illuminating the several lamps 22 behind such winning numbers. The

award feature depends on playing whatever game the score display means is associated with, in this instance, for example, by playing the game piece or ball 48 (or several of them) so as to actuate correspondingly connected game switches 47.

A variety of interesting score control circuits (not shown) may be contrived connecting the motors 33, 34 and index control means or solenoid 40 to master control switch means 60 to effect a shifting of the screen means and indexing thereof in various positions at different times either automatically or dependently upon the scoring action of the particular game apparatus with which the novel score display means may be utilized.

A particular feature of the visual score-changing action of the new screen means is portrayed in FIG. 3 wherein it will be observed that the first five sub-panel sections 12A . . . 12E are not designated to show color except in certain narrow interconnecting "bars" or lines 70, 71, 72, representing respectively the colors red, green, and yellow.

Following after the first five panels (left to right, FIG. 3) of these "linearly inter-related" sight openings are the panels 12F to 12N, which are lined to indicate different blocks of colors, some of these colors corresponding at least to one of the red, green, or yellow colors of the interconnecting lines or bars on the first five panels 12A . . . 12F.

It will also be noticed that some block-color sub-panels have more than one block of coloring thereon; for instance, the sub-panel 12F has a lower color block 70R in red, and an upper block 72Y in yellow, the latter embracing three of the sight openings, and the lower block 70R embracing only two such openings.

Another arrangement of the block coloring of the sub-panels is exemplified by the last two sub-panels 12M and 12N which are respectively lined for only one block or solid color each, namely yellow.

Still another color blocking scheme is exemplified on the panel 12J which includes a small upper block in red embracing two sight openings, a small central block in blue embracing only one opening, and a lower block in yellow embracing two openings.

Still other color designations will be observed in FIG. 3 on sub-panels such as 12G and 12H, and it will be appreciated that a great variety of combinations of color designations and blocking schemes may be devised to vary the particular patterns illustrated.

It will now be understood that by shifting the screen structure 12 to different indexed positions to align different sub-panels selectively with the five vertical columns of score numbers on the glass panel 10, at least three different types of scoring patterns are achieved; the first being the condition where all five of the plain sub-panels 12A to 12E containing only sight openings interconnected by color bars 70, 71, 72, etc. stand before the five number columns on plate 10.

A second scoring pattern is achieved in the condition where some, but less than all, of the five color-bar sub-panels stand before the number array, and one or more of the block-color sub-panels, such as 12F . . . 12N, stand before panel 10.

A third type of scoring pattern can exist whenever any five of the "block-color" sub-panels from 12F to 12N, and none of the "barred" sub-panels, stand before the number panel 10.

In the first type of pattern (all barred sub-panels) a score may be achieved by illuminating the lamps behind any five sight openings connected by a color bar of one particular color, e.g. all red, all green, etc. This scoring can be in addition to the conventional five-in-line rule, so that according to arbitrary rules pertaining to a given game, one may achieve a winning score by "five-in-line," or by "three-in-line" plus two others of one color, etc.

In the second type of scoring pattern (barred colors

plus block colors), a match-up of bar and block color, whether five in line or otherwise, can score.

In the third type of pattern (all block colors) each color or combination of colors, both vertical and across, and with or without any "in-line" illumination (e.g. two up, plus three across, etc.), can score.

It is accordingly apparent that the novel screen mechanism consisting of a number of articulated sub-panels guided in selective movements along a path circumambient of a fixed screen, makes possible a vastly variable scoring system by reason of there being a number of sub-panels in the travelling screen greatly exceeding in number the number (five) of vertical columns in the fixed score display pattern or array; and by reason of the fact that the sub-panels carry different special score indicia related to the sight openings thereon, such as blocks or bars of different colors, the selective positioning of different sub-panels before the internally disposed fixed display screen produces a great choice or variety of scoring conditions determined by visually correlating the various block and bar colorings with illuminated score values.

In addition, the scoring patterns are further variable or changeable in particular relation to the changes effected by shifting sub-panels, through the synchronized coaction of the circuit-changing means, and the indexing action at not less than one sub-panel width per step of the indexing means 37, 38.

The recurring path of the articulated score screen affords a compact mechanism and relatively great capacity for variety and choice of match-up combinations of illuminated lamps and various sight openings other than the conventional, straight "five in a row" combination which is characteristic of the ordinary Bingo "Card."

We claim:

1. A mechanized Bingo Card including a shiftable train of card sections comprising a plurality of articulated vertical screen plates, and means mounting same to travel circumambiently about a fixed indicia panel having score indicia arranged in a predetermined square array of columns for Bingo-type scoring; electrically actuated means for activating any individual indicium; selector switch means operable to connect and disconnect score circuits selectively to said activating means; said plates having vertically spaced sight openings for alignment with any vertical column indicia in said array depending on the position into which said plates are disposed as a result of shifting movement of the train; motor drive means for shifting said train; index means cooperable with said drive means for stopping the train in selected positions; and means for driving said selector switch means in synchrony with said train whereby to connect certain score circuits for operation in correspondence with the selected positions of said sub-panels.

2. A display device comprising a main stationary display panel having illuminable indicia arranged in a uniform square array thereon in vertical columns and horizontal lines, and means for selectively illuminating said indicia; a travelling screen and track means for guiding movement thereof in a recurved path before and behind said panel; said screen being composed of a series of articulated sub-panels each of a length to over-span the height of any of said vertical columns of indicia and each of a width to over-span the distance across any said vertical column, each sub-panel having a series of vertically spaced sight openings severally positioned for alignment with one of the vertically spaced indicia in any said column before which the sub-panel stands; the number of said sub-panels in said screen exceeding the number of said columns, and the display faces of said sub-panels remote from said main panel having delineated thereon particular match-up designations which visually interrelate certain sight openings marked by corresponding designations in a distinctive manner for the purpose of correlating illuminated indicia on the main panel with the visual

5

ly interrelated sight openings on the screen according to which sub-panels are selectively aligned with said columns.

3. Apparatus according to claim 2 further characterized in that said particular designations are color markings visually interrelating the sight openings as aforesaid on more than one sub-panel.

4. Apparatus according to claim 2 further characterized in that said particular designations are bars of distinctive color interconnecting certain sight openings on a plurality of adjoining sub-panels, and are blocks of color embracing a plurality of sight openings on other sub-panels, at least some of the block colors on some of said sub-panels matching one of said bar colors, whereby shifting of the screen will change the visual interrelationship aforesaid indicated by color for the sight openings standing before said main panel by bar colors alone, block colors alone, or combinations of bar and block colors.

5. In a changeable display mechanism, means providing aligned upper and lower stud tracks following a recurring path; a travelling screen comprising a series of adjoining narrow elongated sub-panels articulated at top and bottom by over-length bearing studs joining juxtaposed lugs on adjacent sub-panels, said studs extending in the direction of length of the sub-panels to enter respective upper and lower tracks with an intermediate portion of each stud exposed for engagement with a corresponding upper or lower sprocket wheel situated at the recurring turn in the screen path; drive means for rotating said sprocket wheels to move the screen; and indexing means

6

cooperably related to said drive means and selectively operable to stop the screen travel at intervals of not less than the width of one screen section.

6. A mutating game scoring mechanism comprising a plurality of narrow panels having articulate connection one with another in side by side relation and comprising a shiftable group; means providing aligned upper and lower guide tracks respectively receiving upper and lower portions of said articulated panels and defining a support for guiding the movement of said group along a predetermined path into and through a display plane, said panels each having a plurality of sight openings therein; a plurality of selectively operable indicators disposed behind said plane and arranged in a predetermined display array correlated to the arrangement of said sight openings so as to be visible through the latter when selectively operated; varied indicia means carried by some of said panels, at least, by means of which indicia a certain number of panels are correlated in a related set in predetermined relation to said array; and means for shifting said group of panels along said track to selectively position predetermined different sets thereof in different display positions relative to said array.

References Cited in the file of this patent

UNITED STATES PATENTS

975,009	Wright et al.	Nov. 8, 1910
2,731,632	Field et al.	Jan. 17, 1956
2,871,467	Hailey	Jan. 27, 1959
2,882,056	Hooker	Apr. 14, 1959