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DE WITT W. COOPER

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ELECTRICAL GAME DEVICE BASED ON MATHEMATICAL PROBABILITY

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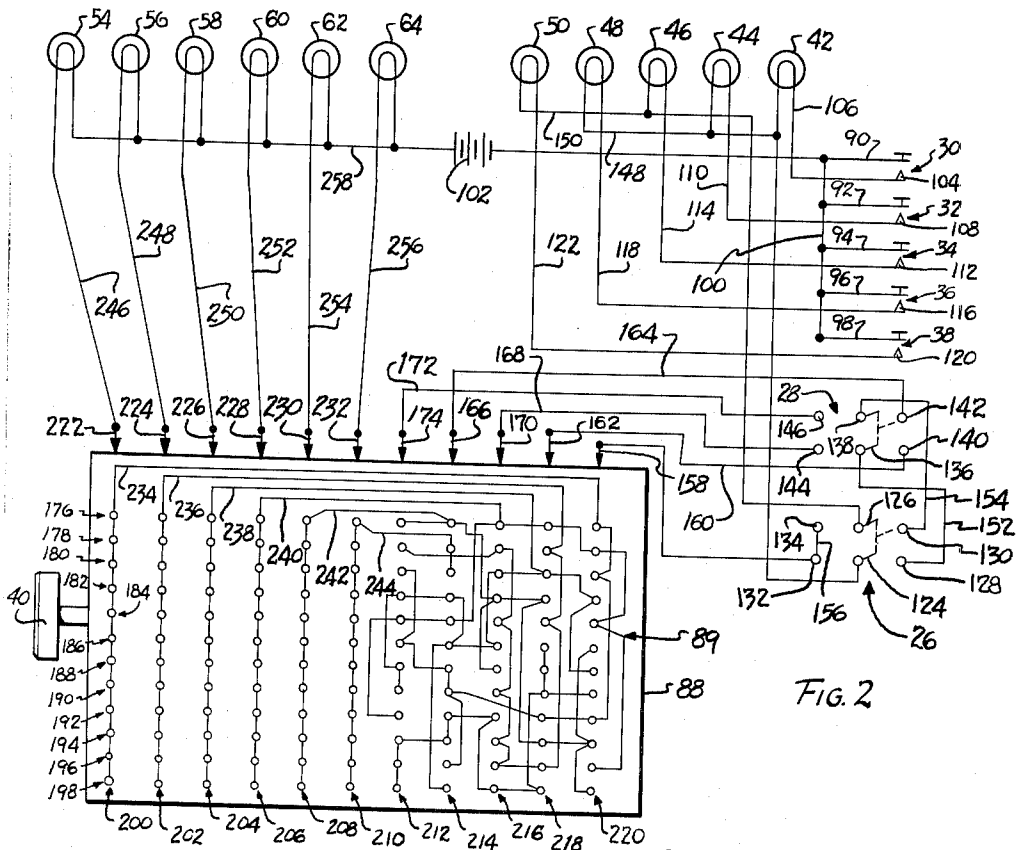


FIG. 2

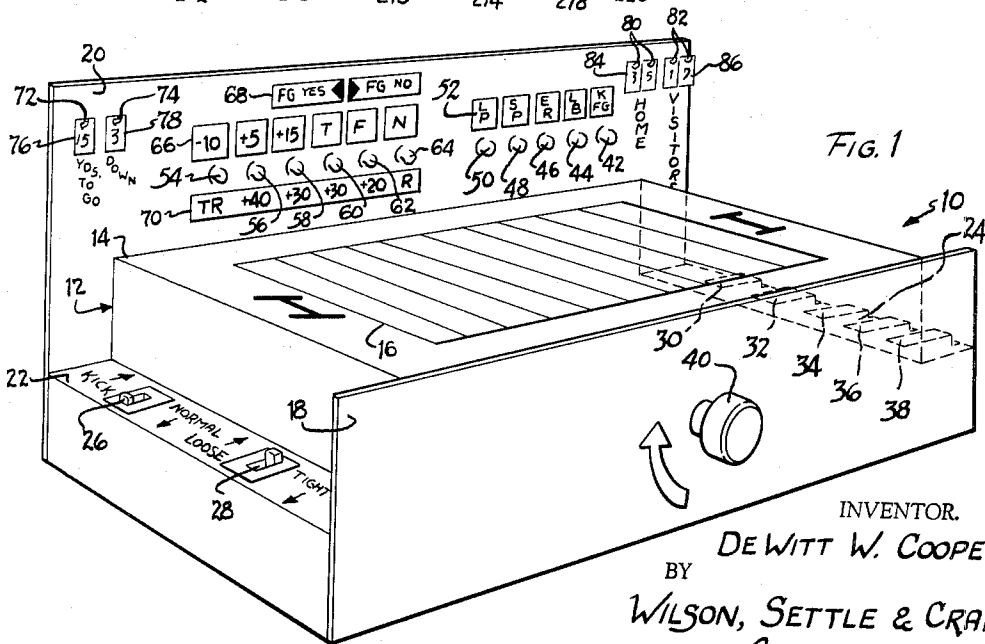


FIG. 1

INVENTOR.
DEWITT W. COOPER
BY
WILSON, SETTLE & CRAIG
ATTORNEYS

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ELECTRICAL GAME DEVICE BASED ON MATHEMATICAL PROBABILITY

De Witt W. Cooper, 24920 Chernick Road, Taylor, Mich.

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This invention relates to an electrical game device, and more particularly to a game device for playing games on the principles of football, basketball and the like in which there is both an offense and a defense, the device having a circuitry such that offensive moves may be counteracted with defensive moves in a manner involving skill on the part of the participants and involving a large number of different possible results so that the result of a given play situation cannot be forecast by the game participants.

An object of the invention is to provide an electrical game device which may be adapted to many different types of games involving an offense and a defense, such as football, baseball, basketball, ice hockey and the like.

Another object of the invention is to provide the offensive player with a variety of different plays which he may select corresponding to the plays traditionally utilized in the game being played.

A further object of the invention is to provide the defensive participant with a number of different defensive plays corresponding to the defensive plays traditionally used to offset particular offensive plays which may be anticipated in a given situation.

Another object of the invention is to provide display lamps to indicate to the defensive player the particular play used by the offensive player.

Another object of the invention is to provide a set of result lamps to indicate to the participants the result of a given play.

A still further object of the invention is to provide a probability matrix to determine the result of a given play situation.

Another object of the invention is to provide in the probability matrix a large number of different possible results, each sequence of results being altered before each play.

A further object of the invention is to accomplish the foregoing objects in an instrument which is relatively simple in construction and of low cost manufacture.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawing forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawing:

FIGURE 1 is a view in perspective of one embodiment of the electrical game device of the present invention; and

FIGURE 2 is an electrical schematic diagram of the device shown in FIGURE 1.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to FIGURE 1, it will be noted that the game device 10 is illustrated as a football game. However, as previously mentioned, the game may be set up to accommodate any sport which involves both an offense and a defense.

The device 10 includes a housing 12 in which is mounted the electrical wiring and most of the components of

the various circuits. The housing 12 includes a raised platform 14 on which is inscribed the outline 16 of a regulation football field including the yard markings. A front panel 18 and a back panel 20 are provided and define, along with the platform structure 14, recesses 22, 24, one at each end of the housing. The recess 22 serves to mount defensive switches 26, 28. The other recess 24 serves to mount five offensive switches 30-38. The defensive and offensive switches cannot be seen from opposite sides of the housing, thus permitting the participants to manipulate the switches in secrecy. The front panel 18 mounts a rotatable knob 40 which controls a drum-type switching device within the interior of the housing. This switching device carries a probability matrix circuit as will be hereinafter described.

Five offensive display lamps 42-50 are mounted in the back panel 20. Each of the lamps 42-50 indicate the play selected by the offensive player. A row of indicia 52 is provided above the lamps 42-50 to indicate the particular play. "LP" stands for long pass, "SP" stands for short pass, "ER" stands for end run, "LB" stands for line buck, and "K-FG" stands for kick or field goal. To the left of the lamps 42-50 a second bank of six lamps 54-64 is provided which indicate the result of a given play.

Immediately above the lamps 54-64 is provided a row 66 having indicia thereon indicating the result of a long pass, a short pass, an end run, or a line buck. "-10" indicates a loss of ten yards, "+5" indicates a gain of five yards, "+15" indicates a gain of fifteen yards, "T" indicates a touchdown, "F" indicates a recovered fumble, and "N" indicates no gain. Immediately above the row 66 is provided another row 68 having indicia indicating the results of a field goal attempt. "FG yes" indicates that if lamp 54, 56, 58 or 60 is lit then the field goal attempt was successful. "FG no" indicates that if lamp 62 or 64 is lit, the field goal attempt was unsuccessful. Immediately below the lamps 54-64 is provided a third row 70 having indicia indicating the results of a kick-off or punt. "TR" indicates touchdown return, "+40" indicates that the ball carrier was tackled forty yards from the line of scrimmage, "+30" indicates that the ball carrier was tackled thirty yards from the line of scrimmage, "+20" indicates that the ball carrier was tackled twenty yards from the line of scrimmage, and "R" indicates that the kicking team recovered its own kick and retained possession of the ball.

A pair of hooks 72, 74 are provided in the upper left hand corner of the panel 20 to receive markers 76, 78 indicating, respectively, yards to go and the down. Pairs of hooks 80, 82 are provided in the upper right hand corner of the panel 20 for hanging markers 84, 86 indicating the score of the home team and the visiting team.

The electrical circuitry of the device, which is illustrated in FIGURE 2, includes three basic units each of which contributes towards the determination of the outcome of a given play. The first unit comprises the normally open offensive switches 30-38. The second unit includes the two defense switches 26, 28. The third unit includes a probability matrix circuit provided on the outer periphery of a drum 88. The drum 88 is shown diagrammatically in a flattened condition so that all of the circuits thereon can be illustrated in one view.

Each of the offensive switches 30-38 has a manually depressible spring arm 90-98. These arms are connected together by lead 100 which is connected to one terminal of storage battery 102. Fixed contact 104 of switch 30 is connected to the filament of lamp 42 by lead 106. Fixed contact 108 of switch 32 is connected to the filament of lamp 44 by lead 110. Fixed contact 112 of switch 34 is connected to the filament of lamp 46 by lead 114. Fixed contact 116 of switch 36 is connected to the filament of lamp 48 by lead 118. Finally, fixed contact

120 of switch 38 is connected to the filament of lamp 50 by lead 122. The circuit through the lamps 42-50 is completed to the battery 102 through the defensive switches 26, 28, the probability matrix circuit 89, and thence through the result lamps 54-64 to the battery. The connection of the lamps 42-50 to the defensive switches will be described at this point, and it will be apparent in the description of the remaining components which follows that circuits through the lamps are completed to power.

The defensive switches 26, 28 are each double-pole double-throw switches. Switch 26 has ganged contact arms 124, 126 and pairs of contacts 128, 130, 132, 134. Switch 28 has ganged contact arms 136, 138 and pairs of contacts 140, 142, 144, 146. The filaments of lamps 42, 44 and 48 are connected together by lead 148 which lead is connected to the contact arm 124 of switch 26. The filaments of lamps 46, 50 are connected together by lead 150 which lead extends to the other arm 126 of switch 26.

Contact 128 of switch 26 is connected to arm 136 of switch 28 by lead 152. Contact 130 of switch 26 is connected to the other arm 138 of switch 28 by lead 154. The remaining two contacts 132, 134 of switch 26 are connected together by lead 156, which lead extends directly to brush 158 which contacts the periphery of drum 88.

The contacts of switch 28 are connected to other brushes which contact the drum 88. Contact 140 is connected by lead 160 to brush 162. Contact 142 is connected by lead 164 to brush 166. Contact 144 is connected by lead 168 to brush 170. Finally, contact 146 is connected by lead 172 to brush 174.

The circuit 89 on drum 88 has a plurality of raised contacts arranged in twelve rows 176-198 and eleven columns 200-220. The brushes 158, 162, 166, 170, 174 are each in alignment with one of the columns 212-220. A second set of brushes 222-232 is provided, each brush being in alignment with one of the columns 200-210.

The various contacts on the drum 88 are interconnected in a manner to provide a probability matrix 89 in substantial accord with the probable results of a given play situation. Six leads 234-244 are provided, each lead extending from one contact of each column 200-210. The leads 234-244 interconnect the contacts of columns 212-220, no two leads being connected to the same contact. Lead 234 interconnects the contacts of column 212, rows 180, 186, column 214, rows 188, 190, 196, column 218, row 192, column 220, rows 176, 180, 192. The lead 236 interconnects the contacts of column 212, row 178, column 216, rows 178, 184, 190, 194, 196, column 218, rows 178, 184, 196. Lead 238 interconnects the contacts of column 212, rows 182, 188, 190, column 214, rows 182, 186, 198, column 216, rows 180, 186, column 218, row 180, and column 220, rows 182, 188. Lead 240 interconnects the contacts of column 212, rows 184, 192, column 214, row 184, column 216, row 176, column 218, row 176, and column 220, rows 178, 184, 196. Lead 242 interconnects the contacts of column 212, row 176, column 214, row 176, column 216, rows 182, 188, column 218, rows 182, 194, column 220, rows 186, 194, 198. Finally, lead 244 interconnects the contacts of column 212, rows 194, 196, 198, column 214, rows 178, 180, 192, 194, column 216, rows 192, 198, column 218, rows 186, 188, 190, 198, column 220, row 190.

The exact contacts of any particular column which are interconnected are selected at random. It is the number of contacts in a particular column which are interconnected which is important in the probability matrix.

All of the contacts of each of the columns 200-210 are interconnected to thus make all of the contacts of each column identical electrical points. Therefore, brushes 222-232 will be connected to their respective

leads 234-244 regardless of the angular position of the drum 88.

The brushes 222-232 are each connected to one side of the filament of result lamps 54-64 by, respectively, leads 246-256. The other side of the lamp filaments are connected to battery 102 via lead 258 thus permitting the completion of electrical paths through the various components of the device by actuation of the offensive and defensive switches.

Considering next operation of the device, it will be appreciated that offensive switches 30, 32, 36 are connected in parallel with respect to the defensive switch 26 and consequently actuation of any one of these switches will produce the same result. The results of the switches 32, 36 are, however, read differently than the result secured by actuating the switch 30. As will be remembered, if a field goal is attempted, the results are read on row 68 above the result lamp and if a kick is attempted, the results are read on row 70 beneath the result lamp.

Similarly, the switches 34, 38 are connected in parallel with respect to the defensive switch 26 and consequently actuation of either of these switches will produce the same result. Even though the results produced by the various offensive switches can be interpreted in terms of only two switches, each switch will nevertheless light up a different one of the lamps 42-50 upon actuation. This is of psychological benefit to the participants in that they can express what they would have done under a given set of circumstances. Additionally, actuation of the switch 30 will indicate to the participants that the result should be read on one of the kick indicia rows 68, 70.

The defensive player has a choice of several possible defenses which he may use to defend against anticipated plays. If switch 26, as viewed in FIGURE 2, is closed to the right, termed "normal" position, then the defense can be set for either an end run or long pass by closing switch 28 to the left or "loose" position, or the defense can be set against a short pass or line buck by closing the switch 28 to the right or "tight" position. If a kick or field goal is anticipated, switch 26 can be closed to the left or "kick" position in which event the switch 28 is taken out of the circuit.

Depending upon the disposition of the switches 26, 28, one of the brushes 158, 162, 166, 170, 174 will be connected to the battery 102. The connected brush will complete a circuit to the battery through one of the contacts in its column 212-220. A circuit will then be completed via one of the leads 234-244 to a contact in one of the columns 200-210, and thence through the respective brush 222-232 to one of the result lamps 54-64 and thence to the other side of battery 102. The drum 88 is turned to a random position so that the participants will not be able to memorize the result of a given position of the drum and thus be able to anticipate the result. The drum 88 is preferably turned after each play so that a different row 176-198 will be in alignment with brushes 158, 162, 166, 170, 174.

The results of several representative play situations will now be described. It is assumed in the following that row 176 is in contact with the brushes. Assuming first that switch 26 is in the normal position and switch 28 is closed to the left or loose position, actuation of either offensive switch 32 or 36 will complete a circuit from the battery 102 to arm 124 of switch 26, thence to arm 136 of switch 28 and thence to brush 170. Brush 170, being in contact with the contact of row 176 of column 218 will complete a circuit to a column 206 and thence to lamp 60 and finally to the battery 102. Lamp 60 indicates a touchdown and thus the conclusion of the play would result in a touchdown for the offensive team.

If, in the above situation, either of the offensive switches 34 or 38 have been actuated, a circuit would have been completed to arm 126 of switch 26, thence to arm 138 of switch 28, thence to brush 174. Brush 174, being in con-

tact with the contact of row 176, column 212 would have completed a circuit to column 208. Brush 230 would then have completed the circuit from column 208 to lamp 62 indicating a recovered fumble by the defense.

Assuming next that the switch 26 is in the normal position and the switch 28 is closed to the right or tight position, depression of either of switches 32 or 36 will complete a circuit to arm 124 of switch 26 and thence to arm 136 of switch 28. The circuit will then extend to brush 162 which is in contact with the contact of row 176, column 218. This contact is connected to column 206 which is connected to a lamp 60, indicating a touchdown. Considering finally the condition where switch 26 is closed to the left or kick position, actuation of the offensive kick switch 30 will complete a circuit to arm 124 of switch 26 and thence to brush 158 which is in contact with the contact of row 176, column 220. This contact is connected to the contacts of column 200 which contacts are connected to result lamp 54. Consequently, if a field goal was attempted, it would have been successful and if a punt or kick-off had been attempted, the result would have been a touchdown return. In playing the game, a field goal cannot be attempted unless the ball is within the forty yard line of the defensive team. In order that the correct probabilities of the device may be utilized for field goal attempts, a field goal attempt should be announced and the defensive player should close switch 26 to the kick position. In the case of a punt, the switch 26 need not be closed to the defensive position, thus permitting the offensive team to try a "quick kick" which would not be anticipated. The probabilities of recovering a fumbled kick are higher if the defense is not set for the kick.

The extent of success of a given play made on the game device has been determined in accordance with the actual chances in a regular game. However, it will be appreciated that an exact probability matrix could not be accomplished within the framework of the relatively simple computer-type device of the present invention and in some respects the probabilities are relatively arbitrary. The table below indicates the chances of a given result with the different play configurations which are possible with the device:

Offensive Switch Actuated	Probabilities						Defensive Switch Actuated
	Lamp 54, -10	Lamp 56, +5	Lamp 58, +15	Lamp 60, T	Lamp 62, F	Lamp 64, N	
32-LB or 36-SP	2	1	3	2	1	3	26-Normal, 28-Tight.
	3	0	3	1	1	4	26-Normal, 28-Loose.
34-ER or 38-LP	0	5	2	1	2	2	26-Normal, 28-Loose.
	1	3	1	1	2	4	26-Normal, 28-Tight.
30-K or FG	3	0	2	3	3	1	26-Kick.

It will be appreciated that the probabilities may be changed as desired, particularly when the device is adapted for games other than football. Additionally, the probability matrix and the offensive and defensive switching systems may be enlarged to provide a more complicated and extensive set of results. In order to permit the players to play both offense and defense from the same end of the game board, a second set of offensive and defensive switches may be hooked into the system with a master switch to connect and disconnect the switches into the system depending upon whether a player is on the offensive or defensive. Also, a rotary disc-type switch may be substituted for the drum-type switch illustrated for the probability matrix circuit.

Having thus described my invention, I claim:

1. An electrical game device for indicating a play result effected by the joint action of an offensive player and a defensive player, comprising a plurality of electrical indicators each for indicating a specific play result, a

source of electrical power, said indicators being connected to the electrical power, a switching network between the indicators and electrical power, said switching network including three separate units connected in series, one of said units being an offensive switching circuit including a plurality of leads, a switch in each of said leads individually closable to select an offensive play, the second of said units being a defensive unit including a plurality of separate leads, defensive switch means interposed between the offensive leads and defensive leads, said defensive switch means having a plurality of closed positions each of which connects all of the offensive leads to at least one of the defensive leads, the third of said units being a plurality of result circuits equal in number to the number of defensive leads, one of the result circuits being for each defensive lead, each result circuit comprising a plurality of contacts, result switch means operable to randomly connect each defensive lead to one contact of the respective result circuits, each contact being connected to one of the electrical indicators, some of said contacts being connected to the same electrical indicator, the number of said contacts in each result circuit which are connected to the same electrical indicator being mathematically determined so that the ratio of this number to the total number of contacts in the respective result circuit is substantially equal to the probability of occurrence of the specific play result represented by the electrical indicator to which the contacts are connected for the combination of closed offensive and defensive switches which led to the selection of the particular result circuit.

2. An electrical game device for indicating a play result effected by the joint action of an offensive player and a defensive player, comprising a plurality of electrical indicators each for indicating a specific play result, a source of electrical power, said indicators being connected to the electrical power, a switching network between the indicators and electrical power, said switching network including three separate units connected in series, one of said units being an offensive switching circuit including at least two separate leads, a switch in each of said leads individually closable to select an offensive play, the second of said units being a defensive unit including at

least three separate leads, defensive switch means interposed between the offensive leads and defensive leads, said defensive switch means having at least two closed positions each of which connects both offensive leads to at least one of the defensive leads, the third of said units being at least three result circuits, one of the result circuits being for each defensive lead, each result circuit comprising a plurality of contacts, result switch means operable to randomly connect each defensive lead to one contact of the respective result circuit, each contact being connected to one of the electrical indicators, some of said contacts being connected to the same electrical indicator, the number of said contacts in each result circuit which are connected to the same electrical indicator being mathematically determined so that the ratio of this number to the total number of contacts in the respective result circuit is substantially equal to the probability of occurrence of the specific play result represented by the electrical indicator to which the contacts are connected

for the combination of closed offensive and defensive switches which led to the selection of the particular result circuit.

3. An electrical game device for indicating a play result effected by the joint action of an offensive player and a defensive player, comprising a plurality of electrical indicators each for indicating a specific play result, a source of electrical power, said indicators being connected to the electrical power, a switching network between the indicators and electrical power, said switching network including three separate units connected in series, one of said units being an offensive switching circuit including a plurality of separate leads, a switch in each of said leads individually closable to select an offensive play, the second of said units being a defensive unit including a plurality of separate leads, defensive switch means interposed between the offensive leads and defensive leads, said defensive switch means having a plurality of closed positions each of which connects all of the offensive leads to different ones of the defensive leads, the third of said units being a plurality of result circuits equal in number to the number of defensive leads, one of the result circuits being for each defensive lead, each result circuit including a plurality of columns of contacts, a brush in alignment with each column and in contact with one of the contacts of its respective column, means to randomly place different ones of the contacts of each column in contact with its respective brush, each defensive lead being connected to one of the brushes, each contact being connected

to one of the electrical indicators, some of said contacts being connected to the same electrical indicator, the number of said contacts in each result circuit which are connected to the same electrical indicator being mathematically determined so that the ratio of this number to the total number of contacts in the respective result circuit is substantially equal to the probability of occurrence of the specific play result represented by the electrical indicator to which the contacts are connected for the combination of closed offensive and defensive switches which led to the selection of the particular result circuit.

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DELBERT B. LOWE, *Primary Examiner.*
JOHN M. HORAN, *Examiner.*