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(54) **ACTION VIDEO GAME FOR WAGERING WHERE THE PLAYER'S REWARD TO A CHALLENGE IS DETERMINED BY COMBINING THE PLAYER'S SKILL IN FACING THE CHALLENGE WITH THE REALIZATION OF A RANDOMLY GENERATED EVENT, WHERE THE LIKELIHOOD OF EACH POSSIBLE REALIZATION OF THE RANDOM EVENT DEPENDS ON THE PLAYER'S SKILL**

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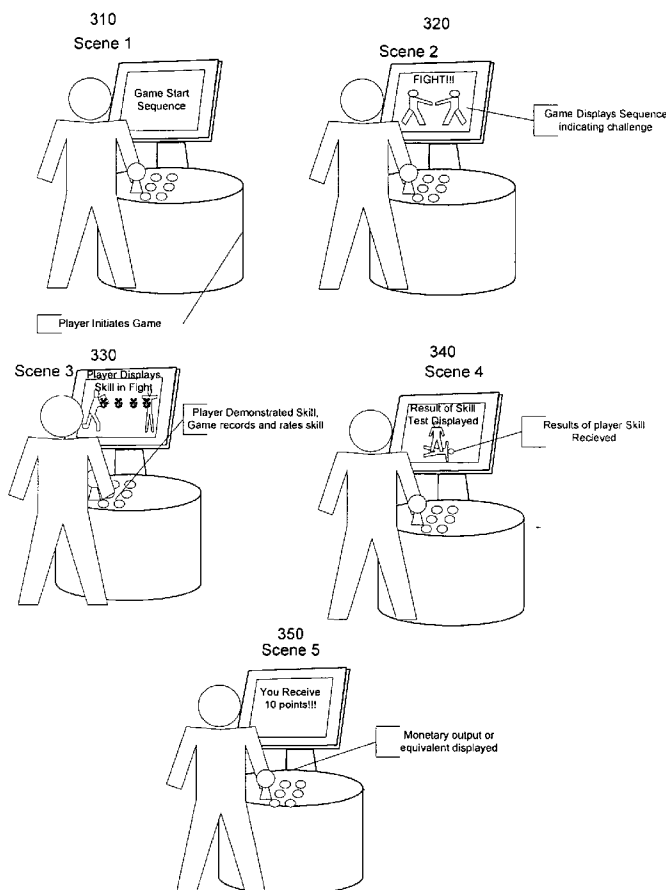
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(57) **ABSTRACT**

An action video game for wagering that determines the player's monetary reward in a round of play by combining the player's skill in facing a challenge presented by the game with the realization of a randomly generated event, where the likelihood of each possible realization of the random event depends on the player's skill. The game progresses by presenting a challenge to the player that requires the player to take a series of actions in order to achieve the goals implied by the challenge. The performance of the player is evaluated according to a number of features that in conjunction define skill, thus generating a skill score. The game's final outcome and monetary reward are determined by combining the skill score with a random component, where the likelihood of the random component itself can be a function of the skill score. In one embodiment of the invention, different independent mechanisms used to generate random events are indexed according to the skill score. Once the player takes action and a concrete skill score is calculated, the corresponding mechanism is chosen. The outcome presented to the player is determined by an event generated from the chosen mechanism. The game can present a single challenge, as described, or a sequential series of challenges where the final reward is a function of the accumulated outcomes from each individual challenge.



Claim 1

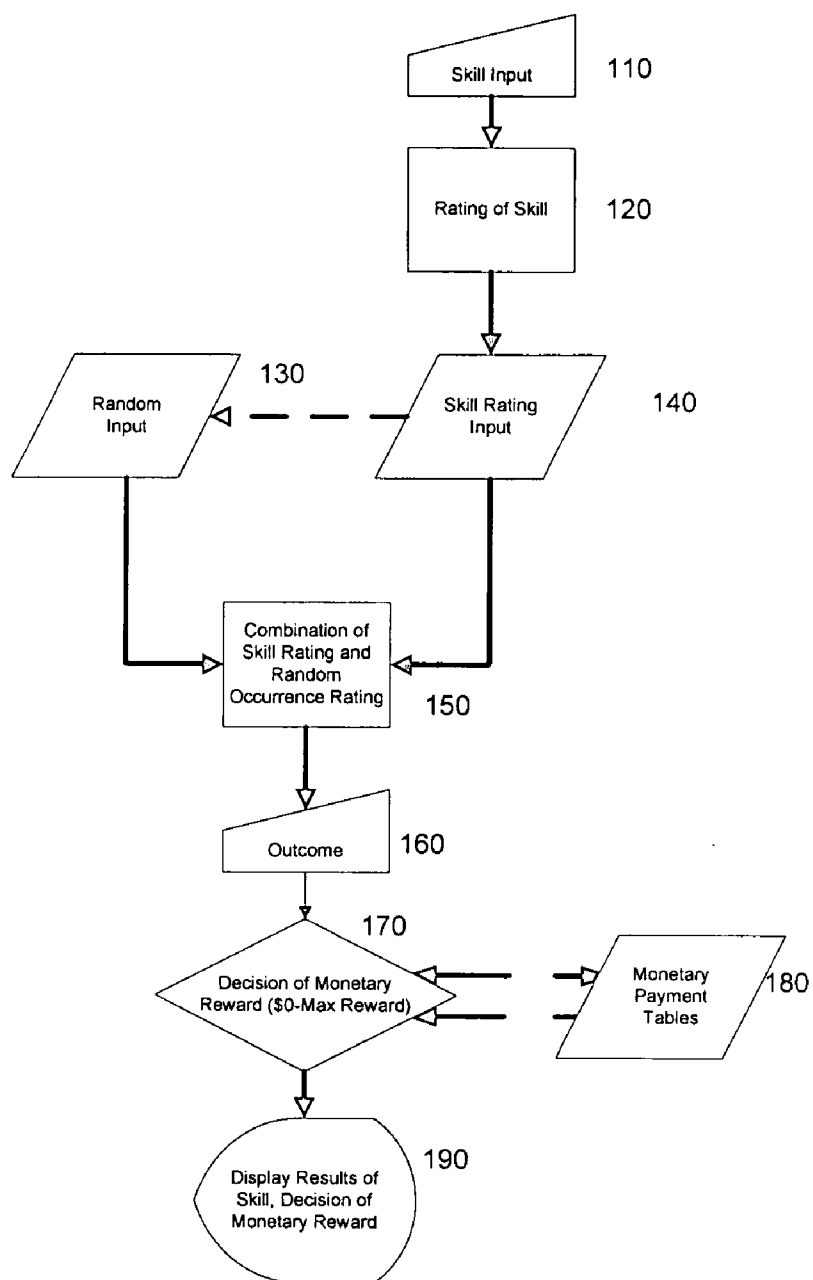


Figure 100

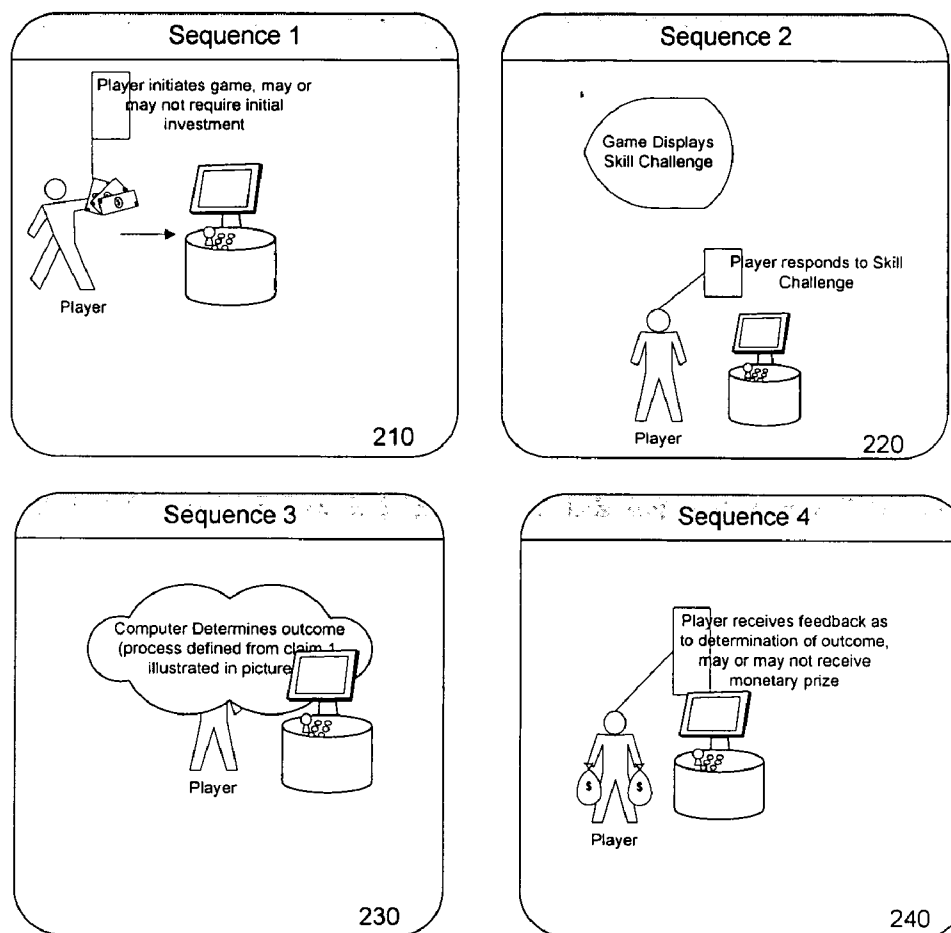


Figure 200

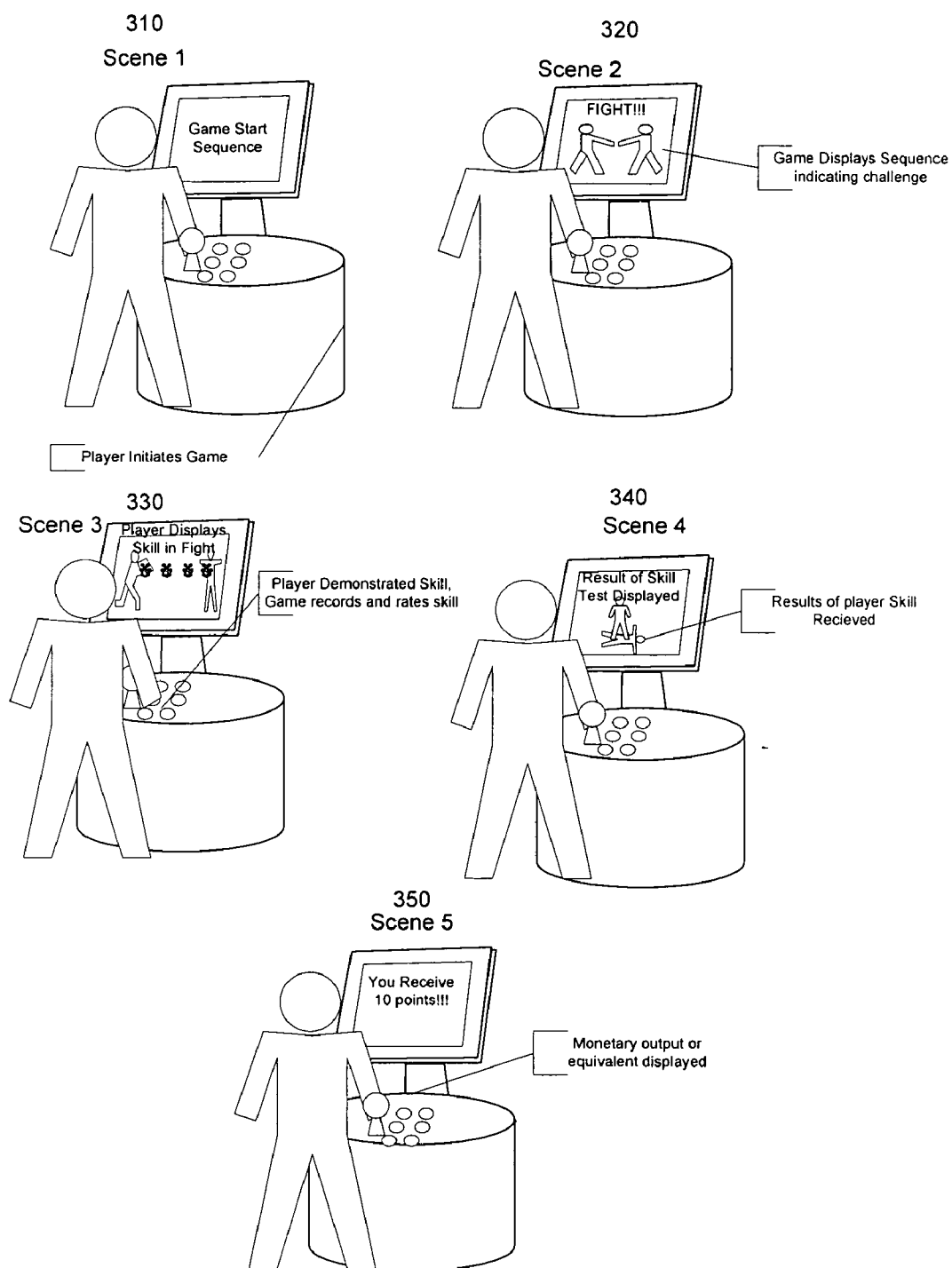
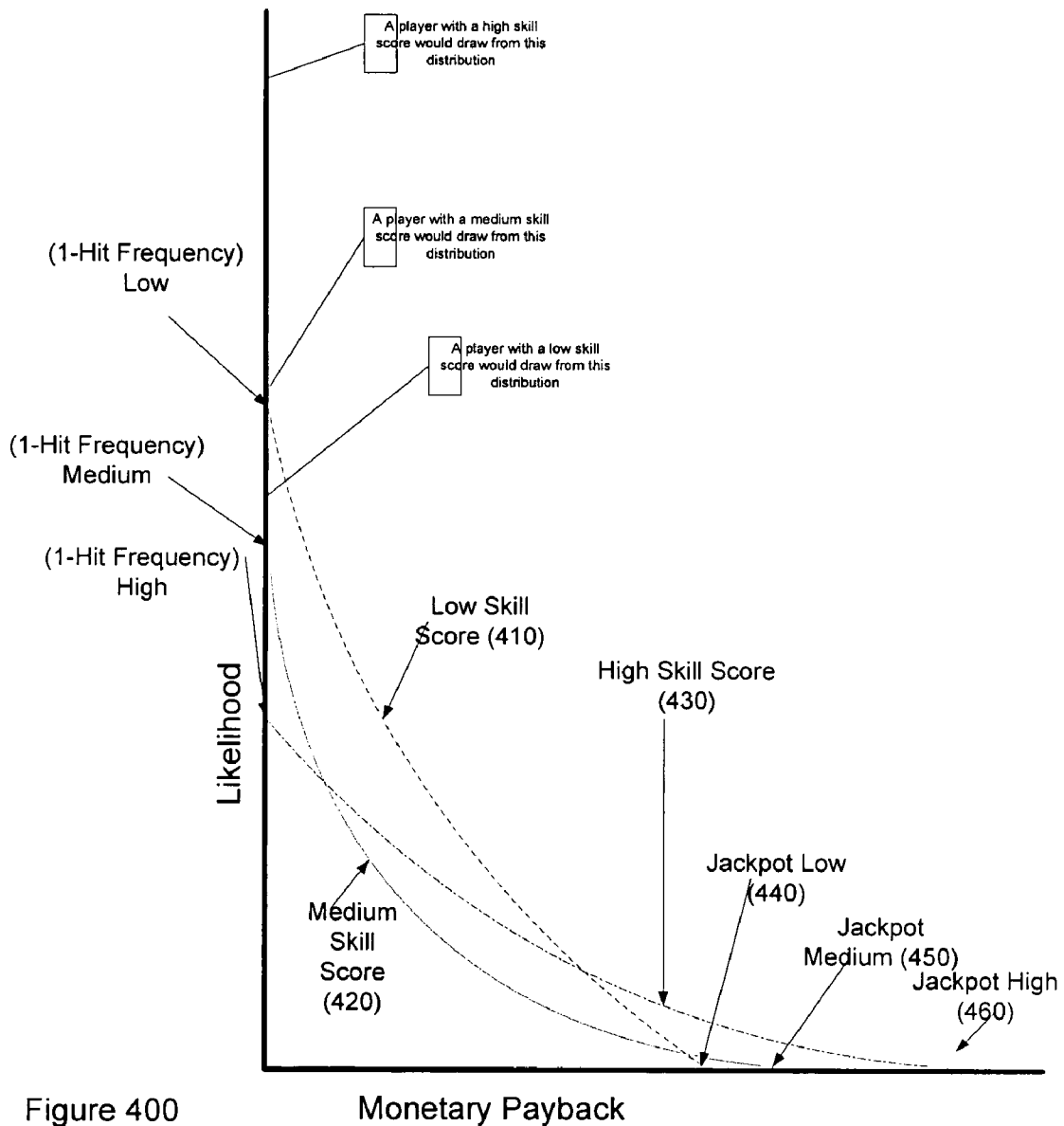


Figure 300

Example of Probability Distributions Shifted by Skill Score (Skill as a Step Function)



Example of Probability of winning Shifted by Skill Score (Actual Distribution shifted by skill score)

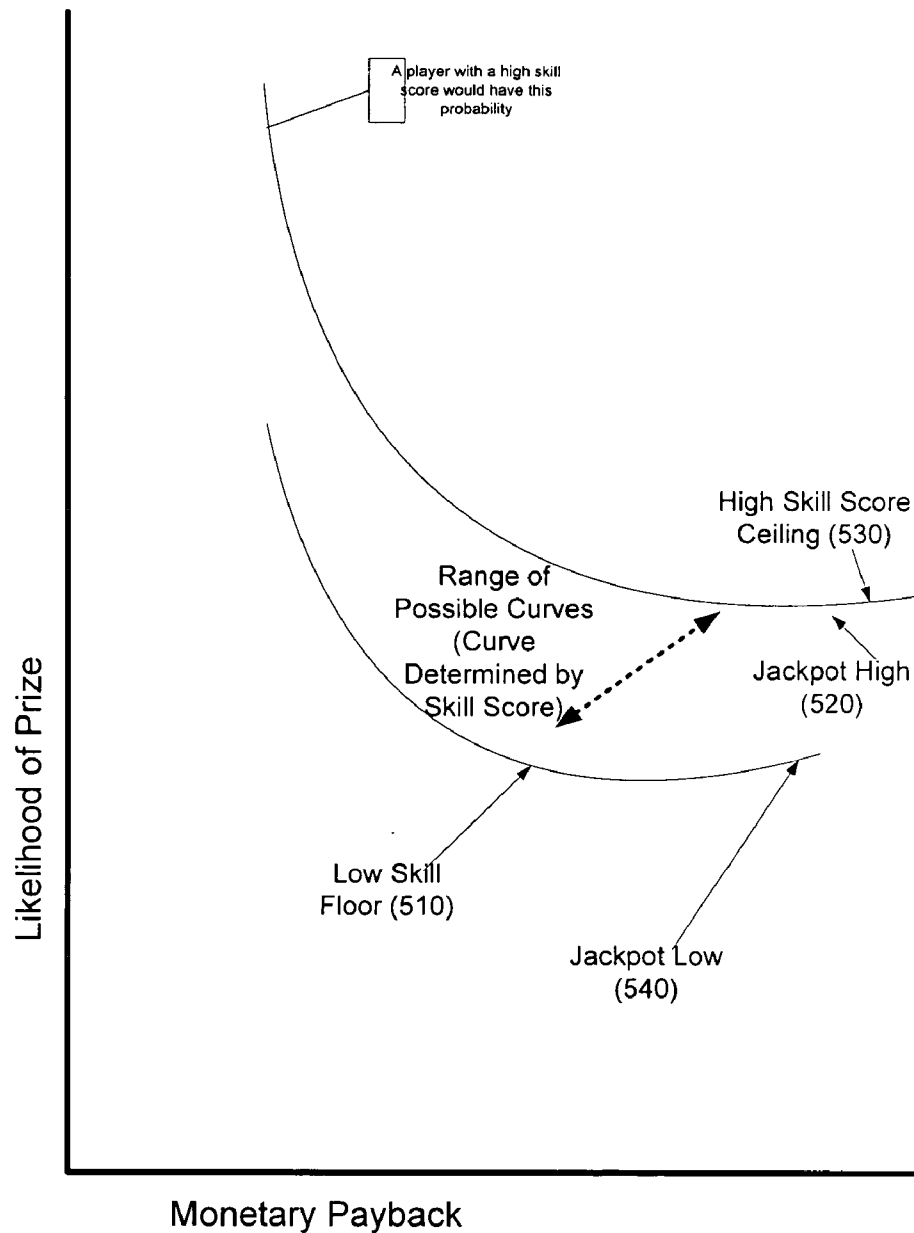


Figure 500

Monetary Payback

Duck Hunt Example

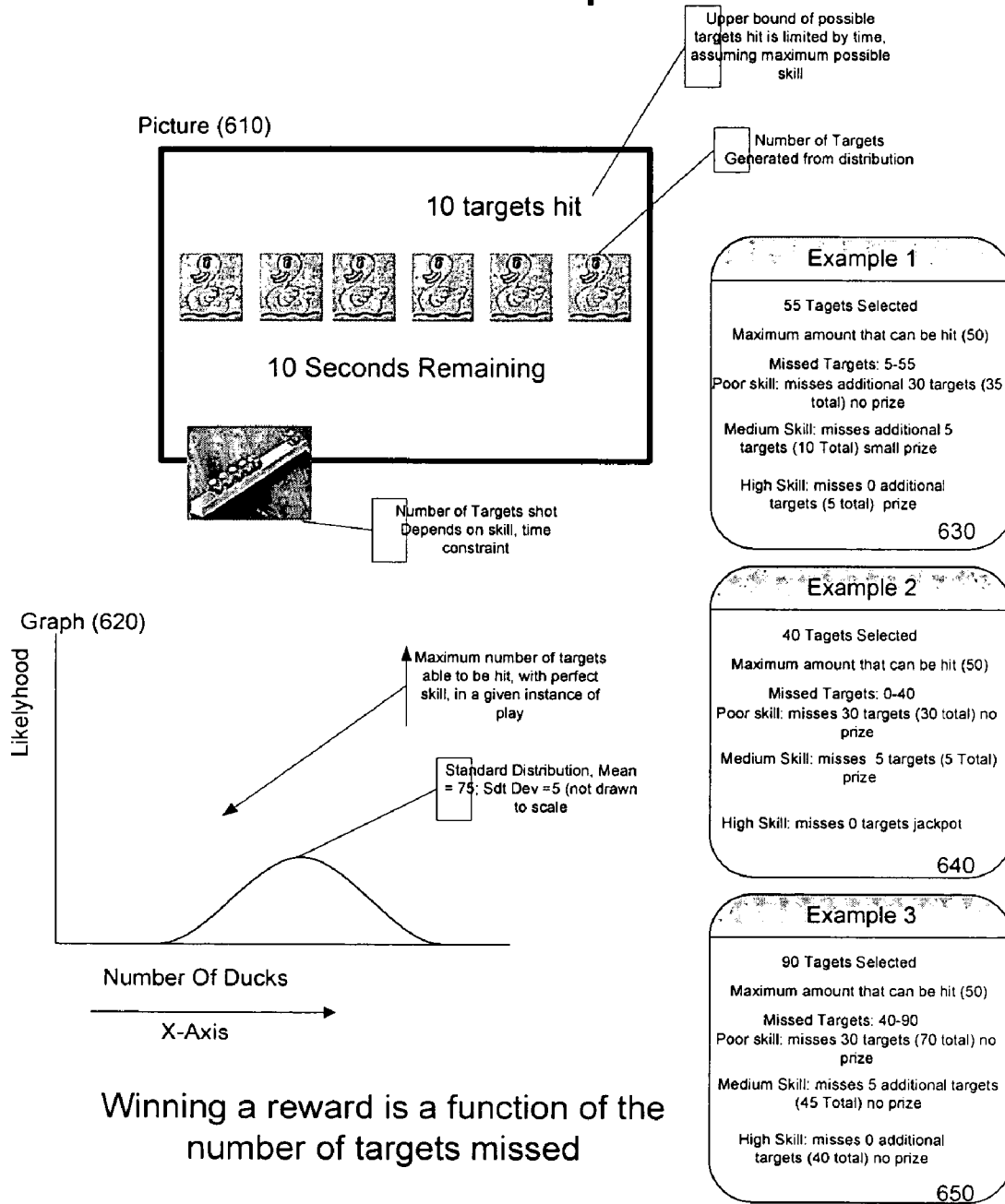


Figure 600

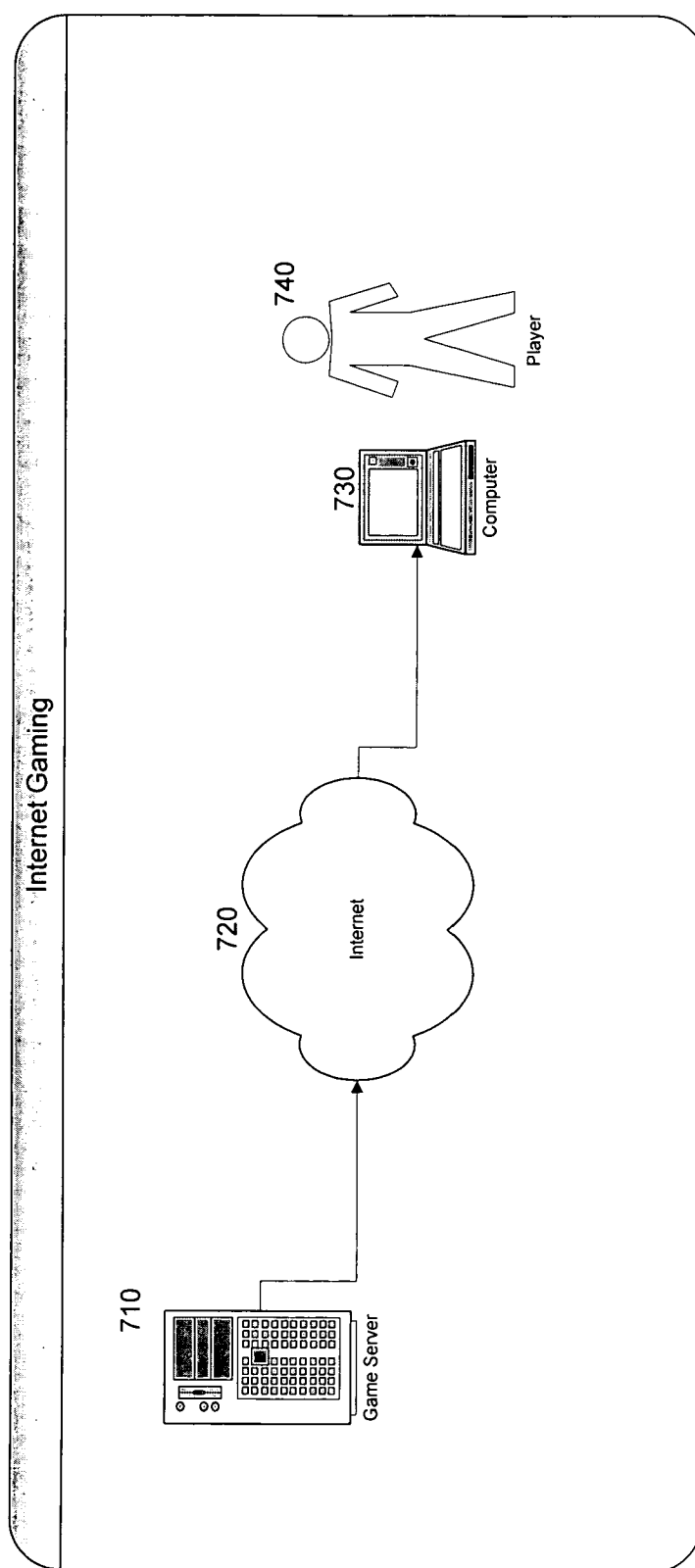


Figure 700

ACTION VIDEO GAME FOR WAGERING WHERE THE PLAYER'S REWARD TO A CHALLENGE IS DETERMINED BY COMBINING THE PLAYER'S SKILL IN FACING THE CHALLENGE WITH THE REALIZATION OF A RANDOMLY GENERATED EVENT, WHERE THE LIKELIHOOD OF EACH POSSIBLE REALIZATION OF THE RANDOM EVENT DEPENDS ON THE PLAYER'S SKILL

TECHNICAL FIELD

[0001] The present invention relates generally to action games for wagering, including slot machines and other games that are suitable for play in a casino and/or as computer video games, on or off the internet, and more particularly to betting games that incorporate player skill into the random process that determines the game's outcome and, as a result, the player's monetary award.

BACKGROUND

[0002] Gaming is becoming an increasingly popular leisure activity in the United States and abroad. Current gaming machines are mostly games of chance, providing monetary awards based on a procedure that draws solely from an independent random mechanism. To date, player skill has played a limited role in video gaming devices. Most of the games offering some degree of player interactivity are card games where skill is related to the ability of calculating probabilities based on the incomplete information revealed by hands that are randomly drawn.

[0003] A player's response in the form of controlling computer animated objects or characters, which requires manual, visual and reaction skills, has been relegated to bonus rounds. However, in these bonus rounds, monetary rewards are ultimately independent of the player's input and skill, and based solely on a randomly generated outcome. These bonus games offer the illusion that skill matters, while in reality skill affects only the timing at which a random award is allocated to the player.

[0004] No attempt has been made to create action video games for wagering that incorporate an objective skill component into a random mechanism to generate the game's outcome; nor has there been the attempt to make the outcome, and ultimately the monetary reward, a function of a randomized measure of skill.

[0005] However, it has been noted that players are constantly looking for ways to affect the odds in their favor. To this end, they have created all kinds of strategies and superstitious beliefs to play games that are purely random. This behavior reflects the psychological need to overcome obstacles and reduce uncertainty. By incorporating skill in a meaningful way, giving players a real chance to improve their odds, this invention will increase player interest and satisfaction. In addition, casino operators will benefit by introducing an innovative new class of gaming devices with great potential to attract large numbers of new customers.

SUMMARY OF THE INVENTION

[0006] This invention presents an action video game for wagering that utilizes a method involving a non-trivial skill component and a non-trivial random component to determine the outcome of a round of play and the corresponding

monetary reward. This game differs from present games in that it combines both skill and chance to determine the outcome and the monetary reward instead of making the final monetary reward a completely random event. The game incorporates skill in a meaningful way by making the player's odds a non-trivial function of skill unlike current games that simply offer the illusion that skill matters.

[0007] The embodiments of the invention can be any type of video game, video game system, or video gaming device that:

[0008] includes a method for entering a player's skill in controlling computer-animated objects or characters, through different types of user interfaces, in response to a challenge or a set of challenges presented by the game,

[0009] rates the skill input and combines it with a random occurrence, or introduces the skill input into a mechanism that determines a random occurrence, in order to generate an outcome,

[0010] displays the outcome to the player and allocates a corresponding monetary award.

[0011] The game play may present the player with a single challenge or a sequence of challenges depending on the outcome of the previous challenge(s) and on the specific embodiment of the game.

[0012] As put forth in the claims, there are many different methods of implementing a combination of skill and chance to determine an outcome in a gambling game such as: linking skill scores to different distributions from which the outcome is drawn, having the skill score be a parameter of the probability distribution determining the outcome, using a method of linearly combining a skill measure and a random draw, or using the skill scores to weigh a set of probability distributions. This list is not meant to be inclusive of all possible embodiments but rather an outline of possibilities to enable reduction to practice by any individual skilled in the art. A sequential flow of how skill and random occurrence can be combined is seen in **FIGS. 110 through 190**.

[0013] One of the simpler methods to incorporate a skill measure into a random mechanism that generates the outcome for a given challenge, as expressed in claim 2 and 3, is to create a series of probability distributions, simulated by a series of independent random number generators, and to index them by ranges of the possible values of the skill measure. Once the skill measure is determined, the outcome is generated by drawing from the distribution (reading from the corresponding random number generator) that corresponds to the range of values into which the realization of the skill measure falls. Suppose the game defines three possible skill levels: high, medium, and low. Suppose further that for each skill level an independent random number generator simulates a payback distribution as shown in the graph of **FIG. 400**.

[0014] We can see that the game presents a positive relationship between skill and odds. The probability distribution associated with a high skill level presents a higher frequency of monetary payback and a larger possible jackpot than the corresponding probability distribution for a medium skill level (see graph of **FIG. 500**). In turn, the distribution for a medium level of skill dominates the distribution for a

low skill level in terms of hit frequency and jackpot size. Thus, in this embodiment, the skill level has a non-trivial effect on the random mechanism generating monetary pay-backs.

[0015] Alternatively, as mentioned in claim 4, the skill score can be incorporated as a parameter in a probability distribution to be simulated with a single random number generator. Suppose that the payback for a round of play is determined by drawing from a Pareto distribution with a cumulative density function given by $1 - (1/(x+2)^\beta)$, where x refers to the payback multiplier and β is a decreasing function of the skill score. If a variable u is generated by a random number generator simulating a uniform distribution in the set $[0,1]$, we can draw the payback for a round of play by determining the value of β , after the player's actions, and solving for x by finding the inverse of the cumulative density function, that is, calculating $(1/(1-u))^{(1/\beta)} - 2$.

[0016] Another method of incorporating skill into the random generation of a challenge's outcome would be to combine a skill measure with a single random component using a linear function (claim 5). Assume, for example, that the skill of a player results in a rating of a numeric value ranging between 0 and 100. Assume further that a random event with a range from 0 to 1 is generated. The outcome of the challenge can be determined by multiplying the skill score and the random event and interpreting it as a percentage of the skill score achieved. In addition, the random event can be constructed to be a natural number between 0 and 1000. The outcome and the monetary reward can be calculated by multiplying the skill score by the random event, interpreting the random event as a payback multiplier. These embodiments of a particular linear combination are not the only possible linear combinations of the method outlined in claim 5, as a possible embodiment of claim 1, but simply examples of a possible embodiment.

[0017] The skill measure and a random component can also be combined using a non-linear function (claim 6), for example the MAXIMUM function. Suppose a game presents the player with a challenge of shooting a series of approaching targets. Assume the skill score is defined as the number of targets successfully destroyed in a given period of time. Once time is up and the number of targets successfully shot by the player is known, the game generates a random number. The final outcome of the game is given by the maximum between the number of targets actually shot and the randomly generated number. The game displays the final outcome to the player and provides a monetary reward based on the outcome according to a pre-defined pay-table.

[0018] In general this invention will be implemented to generate monetary rewards in a round of play of action adventure video games. This type of game or gaming system records skill from the user by presenting him or her with a challenge, where the challenge exhibits one or more types of auditory, visual, olfactory, or touch-type stimuli, and in general requires the player to control computer-animated objects or characters; records the associated user input in responding to the challenge, rates the player's performance, and then combines the skill rating with an associated random event to provide express feedback to the player in the form of a visual and/or auditory outcome and its associated monetary reward.

[0019] A specific embodiment of the invention would be an interactive fighting game implementing the method com-

bining skill and chance to determine outcomes in the game. This game, as shown in FIG. 300, would solicit input from the player, in the form of joystick motions and key combinations, in order to control a computer-animated fighter facing a compute-animated opponent. The opponent's behavior would be controlled by a set of pre-programmed behavioral rules. The skill of the player to hit with strength, land kicks, generate special attacks in specific parts of the opponent's body, as well as defend, block punches, kicks, and special attacks, would be measured. The resulting skill score would then be used to select a random number generator from a pre-designed set in order to draw a random event and determine the final outcome that would be displayed to the player, for example as the decision of a panel of judges or as the reaction from a witnessing crowd. A monetary reward would then be allocated to the player according to the realized outcome following a pre-defined pay-table. Further, display of the player's success or failure in the fight would be relayed through the actions of the player's characters, his ability, as displayed on the game screen, to attack and defend against his opponent, as well as the allocation of a monetary reward upon successful outcomes.

[0020] The player would start this game by entering a bet and or pressing a button, as seen in FIG. 300, scene 310. The game would then display a graphical series of images illustrating the challenge the player is to undertake. Specifically, the game would display two fighters, one representing the player and one representing the opponent. The screen would then notify the player when the match or round was to begin, as seen in FIG. 300, scene 320. The player would then proceed to manipulate his character on the screen by entering different joystick and button combinations to fight his opponent, as illustrated in FIG. 300, scene 330. After a set amount of time or a certain number of points were scored, by either the player or the player's opponent, the round would end. Based on a rating of the player's skill, a random number generator would be chosen from a pre-designed set in order to generate the game's outcome. This outcome would then be displayed to the player in the form of a decision from a set of judges or a reaction from a witnessing crowd FIG. 300, scene 340. This outcome would directly correlate with to a monetary payout as illustrated in FIG. 300, scene 350.

[0021] This game can also be constructed by identifying each player's move as a single challenge. A skill score would be measured for each move, considering for example the location of the punch, the strength, and difficulty of the move. The score would then be combined with a random component to generate an outcome for the move. This outcome would then be displayed by the opponent's reaction (knockout, fall to ground, slight backing movement, or no reaction). The final outcome of the challenge and the corresponding monetary reward would then be calculated as a function of all single outcomes.

[0022] Another embodiment of this type of game would be a racing competition where the player must compete against a group of opponents in running through a field full of hurdles. The skill of the player would be measured in terms of the difference in time with respect to the winner, the number of hurdles hit and whether the player falls. At the end of the race, the skill score would be combined with a random component to generate the outcome that will be

displayed to the player, for example the level of enthusiasm from a witnessing crowd. This outcome would correspond to a monetary reward that would be allocated to the player.

[0023] Yet another embodiment of this game would be a shooting game similar to a “duck hunt” game at a carnival. The player would initiate the game and be given a very large number of targets to shoot in a fixed amount of time. In this implementation, the skill score would be given by the number of ducks successfully shot by the player. Since the game time is limited, there is a limit on the number of ducks that even the most skilled player can shoot. Once the time is up and the total number of targets shot is known, the game would generate a random number to be identified as the total number of feasible targets. The outcome of the game would then be given by the difference between the random number and the skill score and would be interpreted as the number of targets missed by the player. By making the monetary reward a decreasing function of the number of ducks the player missed, skill and chance are successfully combined to generate the game’s outcome (Reference FIG. 600).

[0024] For example, suppose that the maximum number of ducks that the most skilled player can shoot in the time frame of the game is 50. Suppose further that the random number is drawn from a normal distribution with a mean of 75 and a standard deviation of 5. If the monetary reward is a decreasing function of the number of ducks missed, it is easy to see how skill plays an important role in determining, along side the random component, the game’s outcome.

[0025] Although the present invention has been described with respect to the inventors’ preferred embodiments thereof as well as other examples to illuminate possible variations of embodiments, those skilled in the art will note that various substitutions, modifications and variations may be made with respect to the embodiments described herein without departing from the spirit and scope of the present invention.

SUMMARY

[0026] There is a need for in the gaming industry for new and innovative gaming devices. The present disclosure is directed toward further solutions to address this need. Specifically, no gaming system had yet developed a video arcade gambling system combining, in a material way, player skill and a random occurrence. This invention seeks to address the void in the gaming industry.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The present disclosure will become better understood with reference to the following description and accompanying drawings, wherein:

[0028] FIG. 100 is a drawing denoting the logical flow of claim one according to one embodiment;

[0029] FIG. 200 is a sequence representing an example of game play according to one embodiment;

[0030] FIG. 300 is a sequence providing a concrete example of game play according to one embodiment;

[0031] FIG. 400 is a graph representing probability distributions of skill according to one embodiment;

[0032] FIG. 500 is a graph representing probability of a wining shifted by skill score according to one embodiment;

[0033] FIG. 600 is an example game, graph, and three possible outcomes according to one embodiment.

[0034] FIG. 700 is an example game of the game, as a system, played over the internet.

DETAILED DESCRIPTION

[0035] Description Text

[0036] FIGS. 1 through 6, wherein like parts are designated by like reference numerals throughout, illustrate an example embodiment of the said invention according to the present invention. Although the present disclosure will present a description with reference to the example embodiments illustrated in the figures, it should be understood that many alternative forms can embody the present disclosure. One of ordinary skill in the art will additionally appreciate different ways to alter the parameters of the embodiments disclosed, such as the size, shape, or type of elements or materials, in a manner still in keeping with the spirit and scope of the present disclosure.

[0037] Numerous modifications and alternative embodiments of the present disclosure will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the best mode for carrying out the present disclosure. Details of the structure may vary substantially without departing from the spirit of the present disclosure, and exclusive use of all modifications that come within the scope of the appended claims is reserved. It is intended that the present disclosure be limited only to the extent required by the appended claims and the applicable rules of law.

What is claimed is:

1. A method for determining an outcome and a monetary reward for an action video game comprising:

presenting a player with a challenge that requires a player to take one or more actions in order to achieve a set of goals necessary to respond to said challenge; and

calculating an objective skill score based on an evaluation of a series of attributes that relate to a player’s performance in responding to said challenge wherein at least one of said series of attributes is clearly implied by the nature of said challenge such as the determination of a success or a failure in achieving a set of goals presented by said challenge; and

generating an outcome that is a function of said objective skill score and a realization of a random event, wherein both input from said objective skill score and said random event are non-trivial in a determination of said outcome wherein the probability of a different possible realizations of said random event may depend on said skill score; and

producing a monetary reward of an amount determined by a pre-defined pay-table based on said outcome.

2. The method described in claim 1 wherein a series of independent random number generators are associated with each possible skill level; and

wherein upon the skill level is determined, the random realization is generated by reading from the corresponding random number generator.

3. The method described in claim 2 wherein each one of the random number generators is designed and manipulated to approximate independent draws from a probability distribution.

4. The method described in claim 1 wherein the skill score is a parameter in a functional form of a probability distribution of a random component and the probability distribution is simulated by a random number generator.

5. The method described in claim 1 wherein the skill score and a numerical random component are combined in a linear function to generate an outcome for the challenge.

6. The method described in claim 1 wherein the skill score and a numerical random component are combined in a non-linear function to generate an outcome for the challenge.

7. An action video game comprising:

a display presenting a set of one or more sequential challenges to a player; and

a device for inputting the a player's set of one or more skill responses to the said set of challenges; and

a device for rating the set of one or more skill responses to said set of one or more challenges and combining the set of one or more skill response with a set of one or more occurrences or introducing the set of one or more skill responses into a mechanism that determines a set of one or more random occurrences; and

a device for generating a set of one or more outcomes from the set of one or more random occurrences; and

a device for calculating a final monetary reward as a function of said set of one or more outcomes generated in response to each challenge; and

a device for conveying the outcome, the monetary reward, or both to a player.

8. The action video game described in claimed 7 wherein the display is in a slot machine, an arcade style gaming device, or a hybrid gaming device incorporating different forms of user interfaces appropriate for action video games.

9. The action video game described in claimed 7 played where the method of play consists of a display device, input device, and the method of conveyance connected to the internet wherein the method to rate skill and combine with random occurrence, the method of generating one or more outcomes, and the method for calculating monetary reward are located elsewhere on the internet.

10. The action video game described in claim 7 wherein the outcome of the skill response is hidden from the player.

11. The action video game described in claim 7 wherein the outcome of the skill response is hidden from the player but a series of graphics, sounds, smell, and or touch sensations correlated to the skill score are presented to the player.

12. The action video game described in claim 7 wherein there are a set of attributes defining the outcome of the skill response and the importance of such attributes in the calculation of the skill score are chosen by the player from a predetermined set.

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