UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIGHT & WONDER, INC.,
Petitioner,

v.

EVOLUTION MALTA LIMITED,
Patent Owner.

IPR2025-01073

DECLARATION OF MICHAEL CASEY, PH. D. REGARDING U.S. PATENT NO. 10,629,024

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I. INTRODUCTION

A. Engagement

1. I have been retained by counsel for Patent Owner Evolution Malta Limited as an expert witness in the above-captioned proceeding. I have been asked to offer opinions about U.S. Patent No. 10,629.024 in response to a declaration Stacy Friedman submitted on behalf of Petitioner Light & Wonder, Inc. ("L&W"). I also have been asked to provide a discussion of the meaning of certain words and phrases in the claims of the '024 patent, to provide a description of the state of the art of the relevant technology, to analyze the disclosure of the '024 patent, and to analyze various references that L&W contends are prior art to this patent.

B. Background and Qualifications

2. In 1990, I was the valedictorian of my graduating class at the University of California, San Diego. I graduated with a Bachelor of Science in mathematics. In 1995, I obtained a Ph.D. in Mathematics from UC San Diego.

3. After getting my PhD, I served as a postdoctoral research assistant in Theoretical Neuroscience at Brandeis University from 1995-1996. And then my second postdoctoral research position was at Rutgers, Newark in Psychology from 1997-1998.

4. I worked for WMS Gaming from 1999 to 2005. I was the first mathematician WMS hired. I hired and trained a full team. I coauthored many

game designs and provided all math for dozens of games including many hits and core license products. Created software to assist in game balance. Conceived of and programmed a video poker program that computed optimal strategy and maximum return for several versions of video poker as a function of paytables. Created a variety of game mechanics resulting in a dozen or so patents. During this time I routinely attended focus groups for all new designs proposed by the company and developed an intuition for what players looked for in designs.

5. From 2006 to 2009, I worked for Electronic Arts as a contract mathematician. POGO/ EA Games, providing mathematical support (using C++ and Excel) for internet games of chance.

6. From 2009 to 2010, I was the lead mathematician for Global Gaming Group, Inc. Responsible for creating gaming math for a variety of games including poker, slots, roulette, bingo and sweepstakes. Developed software to convert class 3 games to sweepstakes products. Assisted in evaluating, hiring and training other mathematicians. Created software for game simulation and gathering gameplay data.

7. From 2011 to 2015, I was a game design mathematician for Everi. Creation of new casino games. Provide mathematical support for team ideas. Authored and co-authored multiple game design patents.

8. From 2015 to 2018, I was a game designer for VGT. Provide mathematical and game design support for new company products. As the sole VGT mathematician, I was able to provide continuity for extremely successful VGT games and pass that on to the game designers and mathematicians that I hired. Created a very easy software process from early math code for converting class III Aristocrat titles to class II. Created a variety of game mechanics resulting in multiple patents.

9. From 2018 to 2020, I was the Director of Game Math & Design for Aristocrat Gaming. Continued to hire, train, and manage math teams in Reno and India after VGT transitioned to Aristocrat. In addition to team and studio management roles, I created math tools to convert class III titles to a variety of prize-first products, including class II and Washington CDS.

10. In 2022 I worked as a contract mathematician and slot designer for Junto Creation studios for several months. During that time I providing math support and design suggestions for multiple slot games.

11. Since 2023, I have been focused on being an author. I have created a variety of content for Substack. I am writing two books, one on metaphysics that is native to quantum mechanics, and one that is based on Hermeneutic analysis of popular movies, mostly focused on Jungian perspectives.

C. Compensation

12. I am being compensated for my time at the rate of $350 per hour for my work in connection with this matter. I am being reimbursed for reasonable and customary expenses associated with my work in this investigation, including time spent testifying at any hearing that might be held. This compensation is not dependent in any way on the contents of this Declaration, the substance of any further opinions or testimony that I may provide, or the ultimate outcome of this matter.

D. Information Considered

13. My opinions are based on my years of education, research, and experience in the gaming industry, as well as my investigation and study of relevant materials. In forming my opinions, I have considered the materials I identify in the attached Exhibit List.

14. I may rely upon these materials and/or additional materials to respond to arguments raised by L&W and Friedman. I may also consider additional documents and information in forming any necessary opinions, including documents that may not yet have been identified by me or provided to me.

15. I have responded to certain opinions from Friedman below. Although I have not responded to all of his opinions, my lack of response to such opinions does not mean that I agree with them.

II. LEGAL STANDARDS FOR PATENTABILITY

16. Certain basic legal principles have been explained to me by counsel for Evolution. Below, I have recorded these legal standards as they were explained to me.

17. I understand that for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious from what was known before the invention was made. I understand the information that is used to evaluate whether an invention is new and not obvious is generally referred to as "prior art" and can include patents and printed publications.

18. I understand that in this proceeding Light & Wonder has the burden of proving that the challenged claims are unpatentable over the prior art by a preponderance of the evidence. I understand that "a preponderance of the evidence" is evidence sufficient to show that a fact is more likely true than it is not.

19. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to "anticipate" the claim. Second, the prior art can be shown to have made the claim "obvious" to a person of ordinary skill in the art.

20. I understand that a patent or published patent application will be prior art if its effective filing date is before the earliest effective filing date of the claimed invention. A printed publication will be prior art if it was publicly

available before the earliest effective filing date of the claimed invention. I understand that in this proceeding, the information that may be evaluated to show unpatentability is limited to patents and printed publications.

A. Anticipation

21. I understand that, for a patent claim to be "anticipated" by the prior art, each and every requirement of the claim must be found, expressly or inherently, in a single prior art reference as recited in the claim.

22. I understand that claim limitations that are not expressly described in a prior art reference may still be there if they are "inherent" to the thing or process being described in the prior art.

23. I understand that if a reference incorporates other documents by reference, the incorporating reference and the incorporated reference(s) should be treated as a single prior art reference for purposes of analyzing anticipation.

24. I understand that to be anticipatory, a reference must not only explicitly or inherently disclose every claimed feature, but those features must also be "arranged as in the claim." Differences between prior art reference and a claimed invention invoke the question of obviousness, not anticipation.

B. Obviousness

25. I understand that a claimed invention is not patentable if it would have been obvious to a person of ordinary skill in the field of the invention at the time

the invention was made. I understand that in determining whether a patent claim is obvious, one must consider the following four factors: (i) the scope and content of the prior art, (ii) the differences between the prior art and the claims at issue, (iii) the knowledge of a person of ordinary skill in the pertinent art; and (iv) objective factors indicating obviousness or non-obviousness, if present (such as commercial success or industry praise).

26. I understand the objective factors indicating obviousness or nonobviousness may include: commercial success of products covered by the patent claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention by those in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and the patentee proceeded contrary to the accepted wisdom of the prior art. I also understand that any of this evidence must be specifically connected to the invention rather than being associated with the prior art or with marketing or other efforts to promote an invention.

27. I understand that a patent challenger needs to articulate reasoning for combining known elements. Such reasoning can be based on, for example, design considerations, market demands, looking to solutions to related problems in related

fields, and on the "ordinary innovation" and creativity that would be applied by a person of ordinary skill in the art.

28. In addition, I understand that the obviousness inquiry should not be done in hindsight but must be done using the perspective of a person of ordinary skill in the relevant art as of the effective filing date of the patent claim.

III. BACKGROUND

A. State of the Art in February 2018

29. This section provides a brief state of the art as of the priority date of the '024 patent.

1. Roulette

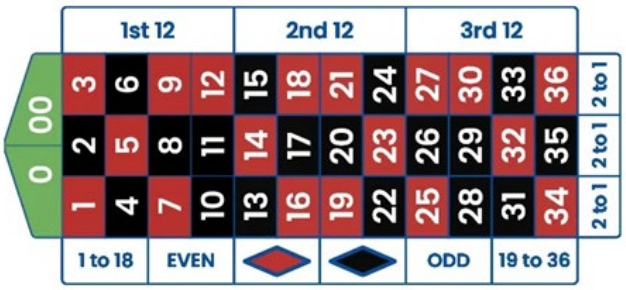
30. Roulette has been played in its present form since the late 1700s, according to French novel La Roulette, ou le Jour by Jaques Lablee, which describes a roulette wheel in the Palais Royal in Paris in 1796. The description included the house pockets: "There are exactly two slots reserved for the bank, whence it derives its sole mathematical advantage." It then goes on to describe the layout with "two betting spaces containing the bank's two numbers, zero and double zero." The book was published in 1801.

31. In the game of roulette, a wheel and ball are used to determine the winning number. To do so, a croupier spins a wheel in one direction, then spins a ball in the opposite direction around a tilted circular track running around the outer

edge of the wheel. The ball eventually loses momentum, passes through an area of deflectors, and falls onto the wheel and into one of the colored and numbered pockets on the wheel. The winnings are then paid to anyone who has placed a successful bet.

32. Today, standard roulette wheels typically use 37 or 38 total positions, spots, or pockets. For the American version, there are 38 total spots, including 36 numbered spots and both 0 and 00. The French or European version uses 37 total pockets, with 36 numbered positions and a 9 pocket. Both variations are represented in Evolution's Lightning Link design.

33. The images below show an American roulette wheel (left) and board (right). There are 18 odd numbers and 18 even numbers. 0 and 00 are considered to be neither even nor odd. Each position is given a color: 18 numbers are red, 18 are black, and 0 and 00 are green. The green zero(s) provide the house edge.



34. Wagers are placed on the game layout using circular "chips" between winning number determinations and for a short time after the next winning number selection has been initiated, while the ball is still spinning quickly. The croupier then calls "all bets off" indicating that the players may no longer wager on the current spin or "play".

35. Payouts in roulette are stated as "X to 1," which means the player gets the original bet back plus X times the bet. In roulette, the "X to 1" is so deeply ingrained in the culture that the style of accounting in par sheets can treat the returned bet as having a special accounting in the math.

36. In gaming, there are two common ways to describe payouts. "X to 1" means you get your original bet back plus X times your bet. "X for 1" means you get X times your bet total, which includes your original stake. For example, if you bet $1 at "5 to 1" odds and win, you get $5 in winnings + your original $1 back = $6 total. If you bet $1 at "5 for 1" odds and win, you get $5 total (this includes your original $1). So "5 for 1" is equivalent to "4 to 1" - they both give you the same $5 total payout on a $1 bet. The "for 1" phrasing is typically used in slot machines, where payouts can be less than the bet and wagered credits for the current play are immediately deducted from the player's credits. The "to 1" style description is more common in table games, including roulette, where returns are

multiples of the bet. "For 1" can be slightly misleading since it sounds like it could be equivalent but gives you one unit less in actual profit than "to 1".

37. Roulette offers a variety of ways to bet on the single number outcome of each spin of the wheel. The player can bet on a single number by making what is called a straight, single, or straight up bet, which returns 35 to 1. Other common bets are the split, where the player places the chip on the line between two adjacent numbers and is paid 17 to 1 if either number is the winning number. Next is the street, which includes 3 horizonal numbers in a row and pays 11 to 1. A corner bet is made by placing a wagering chip on the corner of four numbers, paying 8 to 1 if any of the four numbers are the winning number. A double street or line is a pay of 5 to 1 on two adjacent rows, for a total of 6 winning positions. These bets are known as inside bets and represent the higher paying results. For outside bets (which on a roulette board are located are around the outside of the number grid), there are column and dozen bets, which pay for 1st, 2nd, or 3rd column or 1st, 2nd, or 3rd dozen numbers, meaning 12 numbers are bet in each case and pay 2 to 1. The remaining outside bets each result in even money, 1 to 1, pays, and include Odd/Even, Red/Black, 1 to 18, and 19 to 36, giving 18 total numbers bet in each case.

2. Table games

38. Baccarat, traditionally thought to have originated in Italy during the fifteenth century and subsequently transplanted to the courts of France where it flourished among the nobility, was thereby established as one of the oldest continuously practiced card games in the recorded history of gambling. It is further noted that the game migrated through Europe over several centuries, arriving in its modern form — known as Punto Banco — in Cuban casinos during the mid-twentieth century before being introduced to the Las Vegas Strip in 1959 by the Sands Hotel. The payout conventions now universally observed, wherein the Player hand returns even money, the Banker hand returns even money less a five percent commission, and the Tie returns eight to one or sometimes nine to one. This pay structure was codified through this period of American adoption and has remained substantively unchanged in licensed gaming establishments to this day.

39. Blackjack is traceable in its earliest form to the French game of Vingt-et-Un as documented in writings from the seventeenth century, and subsequently carried to North America through the movements of French colonists. It is acknowledged to have undergone its most consequential transformation during the twentieth century when American mathematicians and statisticians — most notably Dr. Edward Thorp, whose work Beat the Dealer was published in 1962 — demonstrated conclusively that the game could be played with a statistically

minimal house advantage. It is further stipulated that the traditional payout of three to two for a natural blackjack, long considered a foundational term of the game, has in recent decades been altered by numerous licensed operators to a payout of six to five.

40. Craps, whose origins are traceable to the English game of Hazard — itself documented as far back as the fourteenth century and referenced in the works of Geoffrey Chaucer — is acknowledged to have assumed its distinctly American character in the early nineteenth century in New Orleans. The foundational wagers of the Pass Line and Don't Pass Line both pay even money upon resolution, and once a point number has been established, a player may make an additional Odds wager behind the Pass Line, which pays two to one when the point is four or ten, three to two when the point is five or nine, and six to five when the point is six or eight. The Come and Don't Come bets, being functionally identical to the Pass and Don't Pass but initiated after the establishment of a point, carry the same even money resolution and are eligible for the same Odds payments as described above. There are a number of other bets, and their payouts are specified in to-1 odds format.

3. Slots

41. Slot machines trace their origins to 1895 when Charles Fey, a San Francisco mechanic, built the Liberty Bell — a three-reel machine with five

symbols: horseshoes, diamonds, spades, hearts, and the cracked liberty bell. A top payout of three bells in a row paid fifty cents, which was a meaningful sum at the time. The simplicity of the mechanical design made it easy to manufacture and distribute, and the machine became wildly popular in bars and saloons across California.

42. After gambling was broadly restricted in the early twentieth century, manufacturers cleverly rebranded the machines as vending devices, with fruit symbols representing the flavors of gum that winning combinations would supposedly dispense. This is the direct origin of the cherry, lemon, and watermelon symbols that persist on slot machines to this day, long after the gum fiction was abandoned.

43. The video slot era began in the mid-1970s with the development of the first commercially viable machines by the Fortune Coin Company, whose technology was later acquired and refined by International Game Technology (IGT). Unlike electromechanical predecessors, these devices replaced physical reel mechanics with a video display driven by computer logic, fundamentally transforming slot design. By eliminating the mechanical constraints of spinning reels, manufacturers gained unprecedented flexibility in game mathematics, symbol mapping, and feature development. Casinos initially approached the technology cautiously, but its operational reliability and design potential quickly

led to widespread adoption in Las Vegas and beyond. This transition laid the technological foundation for the sophisticated bonus mechanics, branded themes, and networked progressive systems that now dominate modern gaming floors.

44. As video technology matured, payout structures underwent equally profound changes. Traditional three-reel machines were governed by simple, low-frequency, high-volatility mathematics, typically offering a single payline and requiring large wagers to unlock meaningful jackpots. The introduction of multiline video slots — particularly penny denomination games — inverted this paradigm. Instead of concentrating value in rare top awards, designers distributed returns across dozens or even hundreds of paylines, dramatically increasing hit frequency and player engagement. Smaller wins that paid less than the bet replaced the long losing streaks characteristic of older machines, creating a new category of pays that did not return bet, in contrast to table game payouts. Bonus rounds and secondary features became central components of expected value. This evolution also reshaped player perception: denomination no longer directly reflected wager size, as penny slots commonly required multi-credit bets comparable to or exceeding those of higher-denomination legacy games. The modern slot experience thus emerged from a deliberate mathematical and psychological shift toward extended play, entertainment density, and volatility management rather than purely jackpot-driven appeal.

4. Progressive Jackpots

45. The concept of a shared prize pool funded by participant contributions has ancient roots. Lotteries are among the earliest documented examples, with records of prize-based draws appearing in the Roman Empire, where Emperor Augustus organized lottery distributions as a form of public entertainment and civic fundraising. In Renaissance-era Europe, organized lotteries were used by governments and private entities alike to fund public works.

46. This broad structure of pooling funds and awarding them to a small set of qualifying winners became what is now called a progressive jackpot, a progressive system, or just a progressive. The progressive concept was first transferred to slot machines when International Game Technology (IGT) launched the Megabucks wide-area progressive network in 1986. A predetermined percentage of each qualifying wager was contributed to a shared, continuously accumulating prize pool distributed across a linked network of machines. In 1989, the Megabucks network recorded a verified payout of approximately $4.9 million.

47. The emergence of licensed online gaming platforms in the late 1990s introduced globally networked progressive systems, raising novel jurisdictional questions regarding the administration and taxation of prize pools accumulated across multiple sovereign territories. Microgaming's Mega Moolah network, which launched in 2006, became a widely referenced example in online

progressive jackpot history, recording multiple documented awards exceeding $10 million.

48. Progressive jackpot mechanisms became common features of modern slot games by 2010 and are presently applied across multiple game formats, including slot machines and video poker terminals. Beyond traditional slot applications, progressive structures have been added to select table games including Caribbean Stud Poker, Three Card Poker, Let It Ride, and various blackjack and baccarat variants, typically activated through an optional side bet or ancillary wager separate from the primary game.

49. The expansion into table game formats has introduced additional regulatory considerations, as the optional side bet mechanism through which players typically contribute to the progressive pool must be clearly disclosed and governed under applicable gaming rules distinct from those covering the base game itself. Regulatory oversight, including contribution rate disclosure, reserve requirements, prize verification, and payout obligations, falls within the jurisdiction of applicable gaming control authorities in each licensed territory. In internationally licensed jurisdictions, online gaming regulators have issued guidance addressing the cross-border accumulation of progressive prize pools, including requirements for segregated fund accounting to protect player prize entitlements in the event of operator insolvency. Disputes regarding progressive

jackpot payouts, arising from alleged system malfunctions, display errors, or contribution rate discrepancies, have in several documented instances resulted in formal regulatory proceedings or civil litigation, underscoring the importance of precise contractual and regulatory language governing the conditions under which a progressive prize is deemed validly won and payable.

5. Game Design

50. The field of game design is directed to creating and analyzing casino games. Game designers consider a variety of aspects about a game to determine its viability and to balance a game to be attractive both to players and game operators. Game designers will estimate mathematical consistency, consider regulatory issues, evaluate the player experience, tune the house edge, and consider convenience issues, amongst other factors. Building intuition for each of these areas can involve years of active work.

51. Accurately evaluating the mathematics of a game can be especially difficult to do since humans are notoriously bad at estimating probabilities, as is well documented in cognitive psychology. Human intuition handles frequencies and ratios particularly poorly, particularly when events are rare or when multiple probabilities interact. In fact, there is a well-known logical fallacy that stems from this difficulty called the "Gambler's Fallacy." If a coin is flipped and lands on heads 4 times in a row, the probability of a fifth head is still 50/50 (assuming an

unbiased coin), even though the probability of flipping 5 heads in a row is just 3.125%. The Gamblers Fallacy is believing that the fifth heads is less likely to happen, even though the odds are 50/50.

52. Games of chance are outlawed in many jurisdictions, and the ones that permit such games heavily regulate them. Many aspects of games are regulated. Common features that are regulated include history and replay requirements, award frequency issues, return to player amounts, permissible rules, permissible features, and progressive jackpot requirements.

53. Player experience can be complicated to understand and can take years for a game designer to understand. This understanding can be achieved to some extent by playing games directly and by inferring player preference from knowledge of game successes relative to features. But a much deeper intuition is gained by designing games and presenting them to focus groups, which I have done extensively.

54. House considerations are generally more straightforward as far as house edge is concerned. Although the house wants to have an adequate margin to ensure it is profitable, some casinos prefer higher returns to players where possible based on the idea that it encourages customer satisfaction. Other house considerations that can be very important for game design involve convenience of awards, accounting issues, and strongly discouraging designs that create overly

positive expectations since that ruins profits and attracts undesirable player types that generally need to be removed.

55. When designing a game, a designer must consider the perspective of both the player and the house. Games must include features that players find fun and exciting. They also must offer a return to player or "RTP" that a house would find acceptable since games must be balanced to ensure that the house keeps an edge and will be able to generate an acceptable profit to earn a spot on the casino floor. Designers must ensure that a game does not include a feature that is exploitable by players to gain an advantage. A poorly designed feature can be exploited by players to ensure they will win money on average, typically using a betting scheme. Gaming operators such as casinos will scrutinize new games to ensure they are not simply buying a liability that will only make them lose money.

B. Lightning Roulette

56. Evolution's Lightning Roulette is a variation on traditional roulette. In traditional roulette, straight up bets always pay 35 to 1. Lightning Roulette introduces a variable payout element that randomly increases payouts on several selected numbers while the wheel is spinning.

57. In the original live casino version of the game, players place bets electronically through a user interface that allows them to virtually place chips on

numbers on the board. Players receive a live video feed from a studio, where a host presents the game. An example user interface is shown below.[1]

58. After the wheel and ball are spun, bets are closed. Then there is a "Lightning Round" where the Lightning Roulette software randomly selects one or more numbers as "Lucky Numbers" and each is randomly assigned an increased payout called a "Lucky Payout" or multiplier (*e.g.*, between 50x and 500x). *See* EX2011, 2. If the ball lands in one of the selected Lucky Numbers for that round, any player who bet on that number will receive the assigned increased Lucky Payout. An example of the start of the Lightning Round is shown below.

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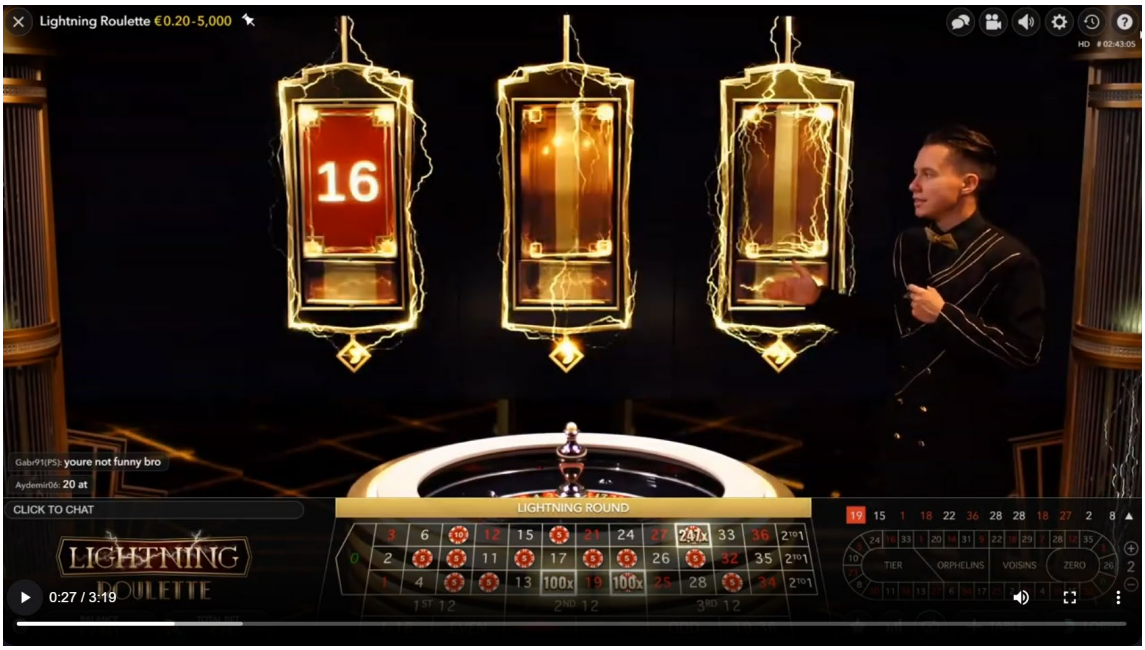
[1] The images/screenshots in the paragraphs that follow were taken from https://games.evolution.com/live-casino/live-roulette/lightning-roulette/

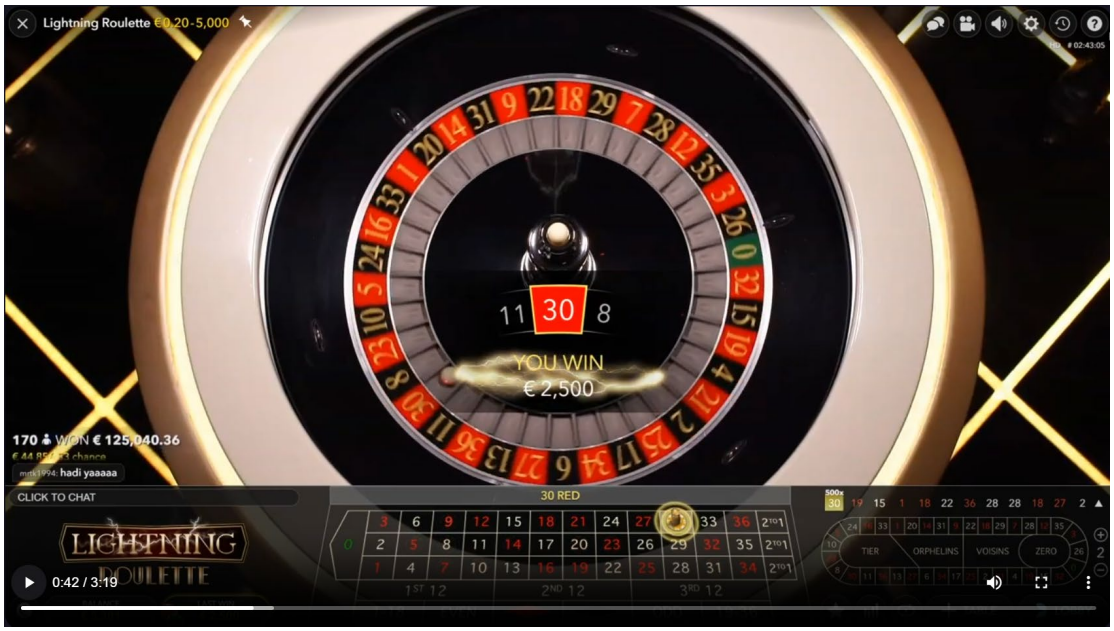


59. The dynamic selection of Lucky Numbers and Lucky Payouts after bets are closed but before the ball lands in a pocket on the roulette wheel adds depth to the game's design. As the ball spins around the wheel, players can see the selected Lucky Numbers and Lucky Payouts and whether they bet on any of those numbers. If a number a player bet on receives a Lucky Payout, that provides the player with a sense of excitement and can feel like a "win" even if the ball does not land on that number. This provides another layer to the game, allowing players to feel excitement even without winning money.

60. The Lucky Payouts can have a variety of increased values such as 49:1 (50x), 99:1 (100x), or 499:1 (500x). The Lucky Numbers and Payouts are randomly selected, which adds a variable reward function to the game. Variable rewards are engaging, and can significantly add to the player experience.

61. An example showing how the dynamic selection of the Lucky Numbers and Lucky Payouts increases the game's level of excitement is below. While the ball is spinning around the wheel, a player can see that both 22 and 30 were selected as Lucky Numbers and that 22 has a payout of 100x and 30 has a payout of 500x. The player also can see that he wagered on both 22 and 30 which are highlighted as being Lucky Numbers, which means the player has two chances to win an increased payout: if the ball lands on 22 (100x) or on 30 (500x).

62. The opportunity to win increased payouts makes Lightning Roulette highly attractive to players. For example, a win on a $5 bet with a typical roulette payout of 35:1 is $180. But if a player wins a $5 bet with a 500x multiplier, the player will get a $2,500 payout.



63. Lightning Roulette has a return to player ("RTP") of 97.1% for European roulette and 94.13% for American roulette. Evolution is able to keep the RTP very close to original roulette because it reduces the standard payout on straight up bets to 29:1. If the player wins on a Lucky Number, the player gets a payout that is higher than the standard rate. If the player wins on a non-selected number, the player will get lower payout than the standard rate. This balance makes the game attractive both to players and to gaming operators.

64. Changing the straight-up payouts was a serious risk for a roulette design where players are keenly aware that the standard payout is 35:1. Decreasing this to 29:1 had the potential to alienate players who would view the change as unfair and too favorable to the house. Lightning Roulette took this risk and lowered straight-up pays to balance out the increased payouts that are exciting

to players. The result is that Lightning Roulette that is highly attractive to both players and the house.

65. Due to its unique features and gameplay, Lightning Roulette has been hugely successful and is enjoyed by millions of players around the world. I address this more in § V.E., below.

IV. Patents Being Challenged

A. The ’024 Patent

1. Overview

66. The ’024 patent describes an system for providing an improved version of roulette. It focuses on features Evolution’s Lightning Roulette game, and Figures 3 to 5 are screenshots of the game.

67. Figure 2 of the patent illustrates the basic flow of a game.

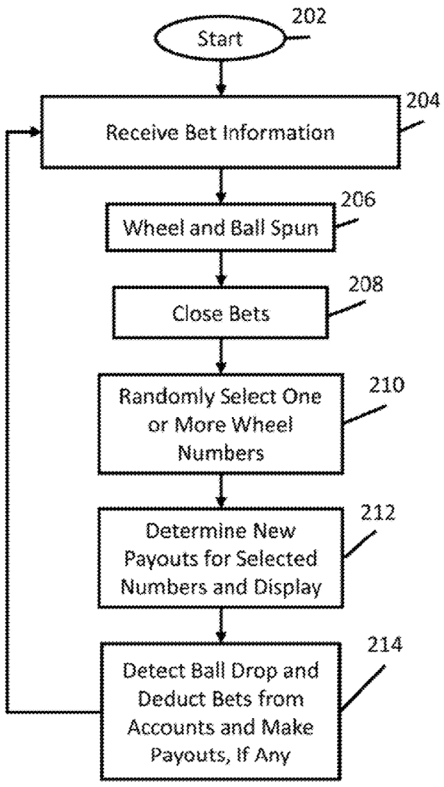


FIG. 2

68. After a game starts, time is allowed for player to make bets. Players can make any suitable roulette bet. EX1005, 4:33-39. The wheel and ball are spun, and then bets close while they are spinning. At least one number is randomly selected from the plurality of numbered positions on a roulette wheel. That selected number receives an increased payout relative to positions that were not selected. EX1005, 5:13-30. This selection is made for each spin of the roulette wheel. The selection also is made before the ball lands in any of the roulette wheel positions. A POSA would have understood that selecting the numbers, determining new payouts, and displaying these to players, builds the excitement of

the game and that this excitement exists on each spin of the roulette wheel, during a phase of the game that offers only a spinning ball and wheel to pay attention to in standard roulette.

69. The patent explains that multiple numbers can be selected to have increased payouts. EX1005, 4:56-61. To balance out the increased payouts, the patent provides that numbers that are not selected can have a lower than standard payout of 29:1. EX1005, 5:26-30.

70. The ’024 patent describes a number of additional features that help build excitement for players. It describes using visual markers to help players identify what numbers were selected for increased payouts and what the payouts are. It describes ways to display a roulette board and provide lightning animations to build the excitement while the ball is still spinning.

2. File History

71. The ’024 patent claims priority to a provisional patent application filed on February 5, 2018.

72. During prosecution, the pending claims initially were rejected over the Yee reference. In the rejection, the Examiner relied on two different spins of Yee’s roulette wheel to disclose the claim elements. In Yee, a player could win an increased payout if the ball landed on the same number on two back-to-back spins of the roulette wheel. EX1009, 10:15-18, 10:48-51. Yee states that “[t]he wager

may be resolved by determining whether the randomly generated number is identical to a randomly generated number from an immediately preceding round." EX1009, 10:15-18.

73. The Examiner found that a first spin of Yee's roulette wheel disclosed randomly selecting a first selected position of the roulette wheel, and then a second spin of the roulette wheel disclosed that the ball had fallen into the first position. EX1006, 061, 079-080. In response, Evolution traversed the Examiner's reliance on two spins of the roulette wheel by amending the claims to specify that the claimed operations occurred "for the spin of the roulette wheel" and that the selection of a first position occurred "prior to the ball falling into a position on the roulette wheel." EX1006, 072-073, 079-080. Below are the relevant limitations of claim 1 of the '024 with the added claim language underlined.

> a hardware processor configured to:
>
> receive first bet information for a first bet from a first player device of a first player <u>on a spin of the roulette wheel</u>, the first bet information corresponding to at least a first position on the roulette wheel;
>
> receive second bet information for a second bet from a second player device of a second player <u>on the spin of the roulette wheel</u>, the second bet information corresponding to at least a second position on the roulette wheel that is different from the first position;

determine that the roulette wheel and the ball have been spun for the spin of the roulette wheel;

randomly select a first selected position on the roulette wheel for the spin of the roulette wheel prior to the ball falling into a position on the roulette wheel, wherein the first selected position is the same as the first position;

determine a first payout for first position and a second payout for the second position for the spin of the roulette wheel, wherein the first payout is higher than the second payout;

determine that the ball has fallen in the first position for the spin of the roulette wheel; and

indicating that the first player is to be paid at the first payout for the spin of the roulette wheel.

74. The Examiner agreed with this distinction and allowed the claims. EX1006, 093.

75. U.S. Patent 11,011,014 is a continuation of the ’024 patent. U.S. Patent No. 11,756,371 is a continuation of the ’014 patent.

3. A Person of Ordinary Skill in the Art

76. I understand that Evolution has asserted that a person of ordinary skill in the art (POSA) at the time of invention would have had a bachelor’s degree in engineering, computer science, or math, and at least two years of experience in designing games (*e.g.*, table games, electronic games, slot machines), and that

substantial work experience could substitute for formal training. I agree with this formulation.

B. Claim Construction

77. I understand that claim terms are interpreted according to their ordinary and customary meaning as understood by a person of ordinary skill in the art ("POSA") at the time of the invention, unless the patentee clearly redefines a term or unmistakably disclaims scope.

1. Payout

78. The term "payout," in the context of the '024 patent and claims, means the amount a player will win in relation to the amount wagered.

79. The claims are directed to roulette. Every claim requires a "roulette wheel" and a "spin of a roulette wheel." Roulette is the only game discussed in the specification.

80. The claims specify that each payout is for a "single position," which means the payout is for a bet made on a single number. A POSA would have understood this refers to a straight-up bet.

81. The '024 patent uses the term "payout" consistent with its ordinary meaning in roulette. It describes exemplary payouts in terms of the amount the player will win based on the amount wagered, such as 29:1 or between 49:1 and 499:1. For example, payouts are described in the following passage:

> At 212, process 200 can next determine the ***increased payouts*** for the numbers selected at 210. Any suitable ***payouts*** can be used in some embodiments. For example, in some embodiments, increased ***payouts*** for the selected numbers can range from 49:1 to 499:1… For example, in some embodiments, the first three numbers that are selected can be assigned a ***49:1 payout***, and the last two numbers that are selected can be assigned a ***499:1 payout***. In some embodiments, two or more of the selected numbers can be assigned the same ***increased payout***, or all selected numbers can be assigned different ***increased payouts***. The ***payout*** for numbers not selected at 210 can be set to account for the increased ***payouts*** of the selected numbers. For example, in some embodiments, the ***payout*** for the numbers not selected can be set to 29:1.

EX1005, 5:15-30.

82. The patent explains that a notation of "500x" can be used "to indicate an increased payout of 499:1 (499:1 plus the original bet return is 500×)." EX1005, 6:8-10. This is consistent with how payouts in roulette typically are stated, as "X to 1," as I explained above.

83. In roulette, the "payout" for a bet refers to the amount a player will win in relation to the amount wagered and is typically written in odds format such as 35:1. EX2028, 10 ("The payout is written in odds format and represents the coefficient to multiply the stake of a won bet."). As is typical for table games, Roulette payouts are specified as "to 1" meaning that the player receives back both

the stated amount and the initial bet. EX2029, 2 ("Roulette payouts are generally stated as 'x-to-1', which means that for every dollar you bet, you will win x dollars, plus you will get back your original bet."). This is in contrast to slot machines, where awards are stated as "for 1" meaning the player receives only the stated amount and not the initial bet. This change is forced by modern slot designs which typically include wins that are less than the bet amount and otherwise not a multiple of the bet.

84. The following are examples of standard payouts in roulette. A payout for a straight up bet on a single position is 35 to 1 (also expressed 35:1), meaning the player will win $35 for every $1 wagered (receiving $36 back). The standard payout for a bet on red/black or odd/even is 1 to 1 (or 1:1), meaning the player will win $1 for every $1 wagered (receiving $2 back).[2]

85. Many sources reflect the same standard use of the term "payout" in roulette. Because roulette payouts are typically stated in odds format (*e.g.*, 35:1), they are sometimes called payout odds. In roulette, the terms "payout," "odds,"

[2] Outside bets, such as red/black or even/odd, are bets corresponding to multiple positions on the roulette wheel (*e.g.*, all 18 red numbers or all 18 odd numbers). Similarly, bets like corners and splits, are bets on multiple position on the roulette wheel. Thus, none of those bets provide payouts for a "single position" on the roulette wheel.

"payout odds," and "payout rates" are often used interchangeably. Many sources define roulette payouts the same way, and use the same standard payouts.

Roulette Star

Bet	Other Names	Payout	p European	p American
Red / Black	Color bet	1:1	48.65%	47.37%
Even / Odd		1:1	48.65%	47.37%
Low / High	1-18 / 19-36	1:1	48.65%	47.37%
Dozen		2:1	32.43%	31.58%
Column		2:1	32.43%	31.58%
6 Number	Six line, Double street	5:1	16.22%	15.79%
5 Number *	Top line, Basket, First five	6:1	-	13.16%
4 Number	Corner, Square	8:1	10.81%	10.53%
3 Number	Street, Line	11:1	8.11%	7.89%
2 Number	Split	17:1	5.41%	5.26%
Single Number	Straight	35:1	2.70%	2.63%

EX2031, 1.

Odds Guide

Odds and potential payout of different bet types

Roulette bet type	Example roulette bet	Potential payout	European roulette odds	American roulette odds
Column	Any number in the third column	2:1	32.40%	31.6%
Dozen	Any of 13 to 24	2:1	32.40%	31.6%
Even bets	Black over red	1:1	48.60%	47.4%
Single number	7	35:1	2.70%	2.60%
Two numbers	Either 19 or 20	17:1	5.4%	5.3%
Three numbers	Any of 28, 29 or 30	11:1	8.1%	7.9%
Four numbers	Any of 5, 6, 8 or 9	8:1	10.8%	10.5%
Five numbers	Any of 0, 00, 1, 2, or 3	6:1	13.5%	13.2%
Six numbers	Any of 4 to 9	5:1	16.2%	15.8%

EX2032, 2.

Vegas Aces

What is the roulette table payout?

The return on the bet on the roulette table depends on the type of bet made. Here are some common bets and their respective roulette table payouts:

Straight-up Bet (single number): 35 to 1.

Split Bet (two numbers): Pays 17 to 1.

Street Bet (three numbers): Pays 11 to 1.

Corner Bet (four numbers): Pays 8 to 1.

Line Bet (six numbers): Pays 5 to 1.

Column or Dozen Bet (12 numbers): 2 to 1.

Even/Odd, Red/Black, 1-18/19-36: Pays 1 to 1.

How Does a Roulette Table Payout?

The roulette table payout depends on the likelihood of the bet made. Once the ball lands on a number, the croupier reveals the number and color of the winning bet and removes all the losing bets. The winning bets are then paid out at the payout rate displayed in the payout table. For instance, a straight-up bet on a single number, which is the toughest to predict, pays 35 to 1.

EX2033, 3.

American Casino Guide

Straight-up – This is a bet based on one specific number. It offers a payout of 35-to-1. So, if you bet $2, you would win $70, plus you keep your original $2 bet.

Split bet – A bet that is on two neighboring numbers. You put the chip on the line between the two numbers to make this bet. This bet pays 17-to-1. So, if you bet $2, you would win $34, plus you keep your original $2 bet.

EX2029, 3.

New Jersey Casino Regulations

Bets	Payout Odds
Straight	35 to 1
* * *	* * *
Red	1 to 1
Black	1 to 1
Odd	1 to 1
Even	1 to 1

N.J.A.C. 13:69F-5.2; EX2034, 1.

Roulette Odds and Profits

Inside bet	Description	Payout
Straight Up	A bet directly on any single number	35 to 1
Split Bet	A bet split between any two numbers	17 to 1

Outside bet	Description	Payout
Colour Bet	A bet on either red or black	1 to 1
Even/Odd Bet	A bet on either even or odd	1 to 1

EX2028, 11.

Wikipedia

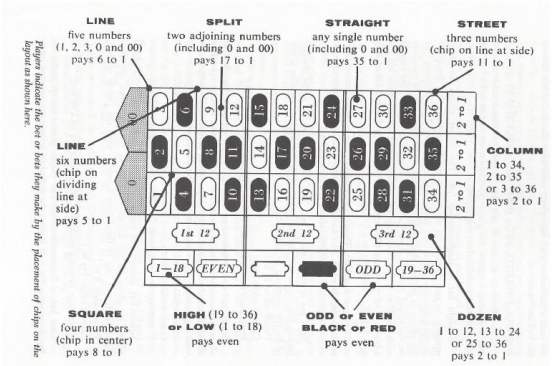
Bet name	Winning spaces	Payout
0	0	35 to 1
00	00	35 to 1
Straight up	Any single number	35 to 1
Odd	1, 3, 5, ..., 35	1 to 1
Even	2, 4, 6, ..., 36	1 to 1
Red	32, 19, 21, 25, 34, 27, 36, 30, 23, 5, 16, 1, 14, 9, 18, 7, 12, 3	1 to 1
Black	15, 4, 2, 17, 6, 13, 11, 8, 10, 24, 33, 20, 31, 22, 29, 28, 35, 26	1 to 1

EX1014, 007.

Bet	Payout	European Roulette Odds	American Roulette Odds
Straight Up	35:1	2.7%	2.6%
Split	17:1	5.4%	5.3%
Red/Black	1:1	48.65%	47.37%
Odd/Even	1:1	48.65%	47.37%

EX2030, 1 (image simplified).

Scarne



EX1032, 012

Caesars

Roulette Betting Chart

Outside Bets		
Example	Odds	Position on Layout
A. Even or odd	1 to 1	Any odd or even number
B. 1-18 or 19-36	1 to 1	Any number 1-18 or 19-36
C. Red or black	1 to 1	any red or black number
D. Any dozen	2 to 1	1-12 or same for second or third dozen
E. Column bet	2 to 1	Any number on that vertical column
Inside Bets		
(Individual numbers and Combinations)		
Example	Odds	Position on Layout
F. Straight up	35 to 1	Any one number
G. Two numbers	17 to 1	Wins on 11 or 12
H. Three numbers	11 to 1	Wins on 28, 29 & 30
I. Four numbers	8 to 1	Wins on 17, 18, 20 & 21
J. Five numbers	6 to 1	Wins on 0, 00, 1, 2, 3
K. Six numbers	5 to 1	Wins on 4, 5, 6, 7, 8, 9
L. Two numbers	17 to 1	Wins on 0 and 00

EX1033, 1

Wizard of Odds

The following table displays the available bets, the win (on a "to one" basis), and the probability of winning under U.S. rules. All casinos in the U.S. follow these rules except for in Atlantic City. The house edge on all bets is 1/19, or 5.26%, except for the 0-00-1-2-3 combination, which carries a house edge of 7.89%.

Double-Zero Roulette

BET	PAYS	PROBABILITY WIN	HOUSE EDGE
Red	1	47.37%	5.26%
Black	1	47.37%	5.26%
Odd	1	47.37%	5.26%
Even	1	47.37%	5.26%
1 to 18	1	47.37%	5.26%
19 to 36	1	47.37%	5.26%
1 to 12	2	31.58%	5.26%
13 to 24	2	31.58%	5.26%
25 to 36	2	31.58%	5.26%
Six line (6 numbers)	5	15.79%	5.26%
First five (5 numbers)	6	13.16%	7.89%
Corner (4 numbers)	8	10.53%	5.26%
Street (3 numbers)	11	7.89%	5.26%
Split (2 numbers)	17	5.26%	5.26%
Any one number	35	2.63%	5.26%

EX1046, 002.

86. A POSA would have understood that a roulette payout is different than a progressive jackpot.

87. In its Institution Decision, the Board noted that the ’024 specification states that “Any suitable payouts can be used in some embodiments.” Inst. Dec., 8. In the sentence that immediately follows, the specification provides “For example, in some embodiments, increased ***payouts*** for the selected numbers can range from 49:1 to 499:1.” A POSA would have understood that the specification’s reference to “any suitable payout” meant that any suitable payout odds could be used. As I noted above, the terms “payout” and “payout odds” are used interchangeably in roulette. The specification’s reference to any suitable payouts does not suggest to a POSA that payouts could be something other than odds-based payouts that are

always used in roulette. Nothing in the ’024 patent suggests to a POSA that a payout includes a jackpot or an absolute amount to be won regardless of the wager.

88. I understand that L&W has asserted that a “payout” simply refers to “an amount paid.” That is not how the term “payout” is used in roulette.

89. I also understand L&W has asserted that payout can have a broader meaning because the Kido reference states that a progressive jackpot can be a “special payout” and the Baron reference describes “progressive payouts.” The Kido and Baron references do not describe a conventional roulette game. Instead, those references describe modified versions of roulette that have a progressive jackpot feature added to the game. Both references acknowledge they are using the term “payout” atypically.

90. For example, Baron explicitly recognizes that progressives are “unconventional” in roulette. It states its system can facilitate “an unconventional roulette wager (e.g., a side wager, a progressive wager, or a bonus wager).” EX1008(Baron), [0028]. That is in contrast to “conventional roulette wager[s]” such a “straight wager, split wager, street wager, corner wager, red wager, black wager, even wager, odd wager, dozen wager.” *Id.*, [0038]. Baron describes a progressive wager, a bonus wager, and conventional wager as being different things. *Id.*, [0056]. Baron describes making a “payout on the progressive wager”

or on a "bonus wager" as distinct from a payout on a conventional wager. *Id.*, [0042], [0043], [0058], [0062]-[0063].

91. Kido describes a roulette game that has been modified to include "privilege" routines. Kido describes a progressive jackpot as one of four or five privileges. Kido states that the privilege routines make "special payouts." It describes the progressive jackpot as a "special payout," not a conventional roulette payout. EX1007(Kido), [0129]. Kido acknowledges that typical payouts are stated as rates:

> The typical odds table corresponding to the bet-type has a column of bet types and a column of payout rates. The data showing bet types such as "Straight", "Split", "Street" and the like are stored in the column of bet types. The bet types will be specifically described later. The data showing the payout rates such as "35: 1", "17:1", "11: 1" and the like are stored in the column of payout rates, correspondingly to the bet types. Thereby, when a bet is made in a bet type of "Straight", 35 pieces will be paid out per 1 piece bet.

Id., [0172].

92. Progressive jackpots are also different than an odds payout from a regulatory perspective, where many new considerations are required in order to host a progressive jackpot in a game. This is in part because when money is deposited in a jackpot, the casino does not own that money and instead is holding it

in escrow for a winner. The regulatory considerations include, but are not limited to ensuring prize pool integrity, contribution rate disclosure, meeting seed and reset value requirements, win verification and authentication, malfunction and display error policies, and player communication and advertising standards.

93. Progressive jackpots are also different than an odds payout from a game design perspective. The excitement of a feature is a key consideration in game design. Kido proposes a progressive jackpot as a privilege. A POSA would understand that a progressive jackpot is generally considered to be more exciting than a fixed odds payout. A POSA would not consider Kido's progressive to be the same as a less exciting fixed odds payout.

94. Progressive jackpots are hit rarely, so they do not provide significant game-to-game variance in awards for most players. That is different than the dynamically determined payouts described and claimed in the '024 patent, which will provide variance for most if not all players.

95. A POSA would have recognized that Kido's and Baron's use of the term "payout" to refer to the progressive jackpots that each reference added to roulette was atypical for a roulette game. In the context of a progressive jackpot, the word payout sometimes is used in a general sense as a verb to refer to paying the jackpot. In the context of the well-known roulette rules and terminology, a "payout" in roulette refers to the amount a player will win in relation to the amount

wagered. Baron's and Kido's unconventional use of the word payout would not have changed a POSA's understanding that the term in the context of roulette.

2. Spin of the Roulette Wheel

96. The term "a spin of the roulette wheel" appears in every independent claim. It plain and ordinary meaning in the context of the patent and file history is one spin of one roulette wheel. I understand that the Board adopted this construction in its Institution Decision. I agree with the Board's construction, as explained below.

97. The independent claims each specify a number of operations that are performed "for the spin of the roulette wheel." A POSA would understand this to mean the same spin of the same wheel. That is consistent with what is shown in the specification, which is a game with one roulette wheel and where all of the claimed operations relate to the same spin of that wheel. *See, e.g.*, EX1005, Figs. 2-5.

98. The "spin of the roulette wheel" claim language was added to the various elements during prosecution of the parent '024 patent to distinguish the Yee reference. The Examiner rejected pending claims based on Yee, relying on two different spins of Yee's roulette wheel to disclose the claim elements. In Yee, a player could win a higher amount if the ball landed on the same number in two back-to-back spins of the roulette wheel. EX1009(Yee), 10:15-18, 10:48-51. Yee

states that "[t]he wager may be resolved by determining whether the randomly generated number is identical to a randomly generated number from an immediately preceding round." EX1009, 10:15-18.

99. The Examiner found that a first spin of Yee's roulette wheel disclosed randomly selecting a first selected position of the roulette wheel, and then a second spin of the roulette wheel disclosed that the ball had fallen into the first position. EX1006('024 file history), 061, 079-080. In response, Evolution distinguished the two spins of the roulette wheel the Examiner relied on by amending the claims to specify that the claimed operations occurred "for the spin of the roulette wheel" and that the selection of a first position occurred "prior to the ball falling into a position on the roulette wheel." EX1006, 072-073, 079-080. The Examiner agreed that the amendment distinguished the claims from Yee, and he then allowed the claims so the patent could issue. EX1006, 093. Thus, Evolution expressly distinguished systems and processes that use multiple spins of a roulette wheel, and limited the claims to systems and processes that use a single spin of the roulette wheel to determine a first payout for a first position that is higher than a second payout for a second position.

3. Sequence of Steps

100. The independent claims all specify a hardware processor configured to perform a series of steps.

101. I understand that elements in a claim usually are not required to be performed in the order in which they appear. In certain circumstances, however, claim elements do need to be performed in the order in which they appear. That order is required where "the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written" or where "the specification directly or implicitly requires an order of steps." *Mformation Techs. v. Research in Motion Ltd.*, 764 F. 3d 1392, 1398-99 (Fed. Cir. 2014) (quotation omitted).

102. Claim 1 of the '024 patent specifies a hardware processor configured to perform a number of steps, including the following:

> [i] determine that the roulette wheel and the ball have been spun for the spin of the roulette wheel;
>
> [ii] randomly select a first selected position on the roulette wheel for the spin of the roulette wheel prior to the ball falling into a position on the roulette wheel, wherein the first selected position is the same as the first position;
>
> [iii] determine a first payout for the first position and a second payout for the second position for the spin of the roulette wheel, wherein the first payout is higher than the second payout; and
>
> [iv] determine that the ball has fallen in the first position for the spin of the roulette wheel;
>
> [v] indicating that the first player is to be paid at the first payout for the spin of the roulette wheel.

103. These steps must be performed in the order listed. As a matter of logic, step [i] determining the wheel has been spun "for the spin of the roulette wheel" must occur first. Step

- Step [i] the wheel is spun "for the spin of the roulette wheel." Logically, this action must happen first because the subsequent limitations all reference the spin of the roulette wheel.
- Step [ii] specifies randomly selecting a first selected position "prior to the ball falling into a position." This must happen after the ball has been spun and before it falls into an outcome position.
- In Step [iii], a first and second payout are determined. This must happen after the ball has been spun and before it falls into an outcome position. Logically, the determination of the first and second payouts must occur before the ball falls into the "first position" in step [iv]. Players would be wary and skeptical of a game that announces increased payouts only after the winning number has been determined. In addition, determining the payouts while the ball is spinning allows the excitement to build.
- Step [iv] the ball falls into the first position.
- Step [v] indicate that the player is to be paid at the first payout. This must happen after determining the payout and after the ball falls into a position.

104. The process described in the specification also requires this sequence of steps. During prosecution, Applicant added the for the spin of the roulette wheel elements to traverse the rejection over Yee. With respect to the "randomly select" element and the amended language overall, Applicant told the Office that "Generally speaking the 'position' being selected in this portion of claim 1 corresponds to the selection made in box 210 of FIG. 2 of the present application." EX1006, 080.

105. I have reproduced Figure 2 below. Step [ii] generally corresponds to box 210. Likewise, Step [iii] generally corresponds to box 212 and Steps [iv] and [v] generally correspond to box 214.

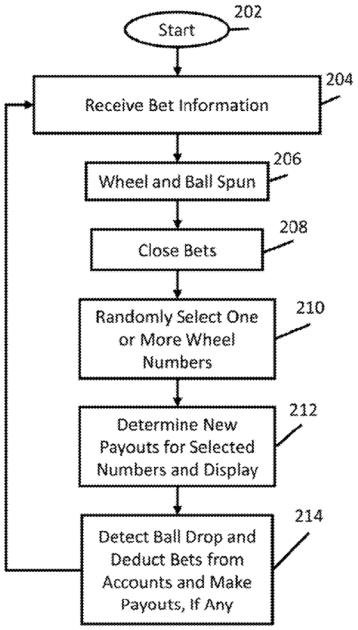


FIG. 2

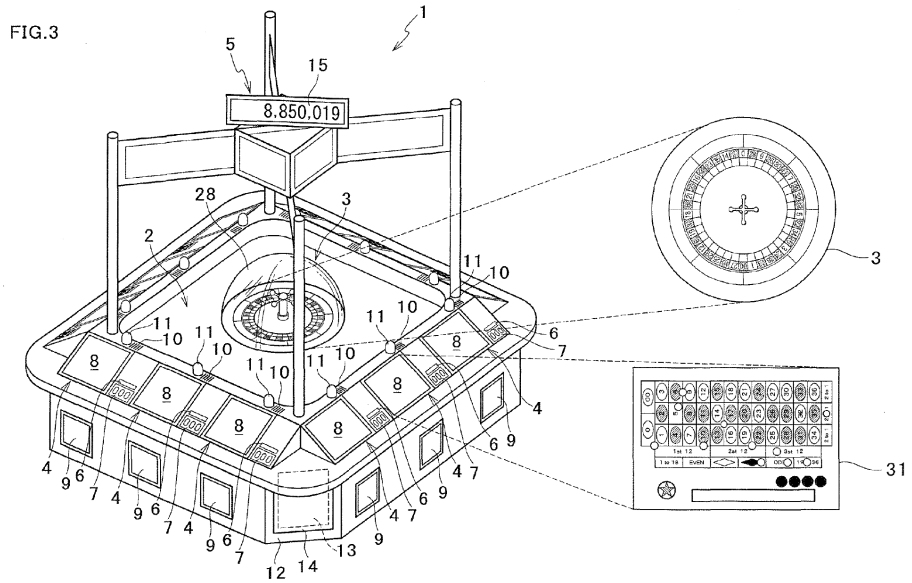
106. Steps 210, 212, and 214 must occur in the sequence listed in Figure 2. Step 210 must occur before Step 212 because Step 210 "randomly select[s] one or more wheel numbers" and Step 212 "determin[es] new payouts for [those] select numbers." Step 212 must occur before Step 214 for several reasons. One reason for this is that Step 212 determines and displays the new payouts. A POSA would have understood that the determination and display of new payouts for selected numbers builds excitement for players who are waiting for the ball to drop. Another reason Step 212 must occur first is that the payouts determined in Step 212 must be known before those payouts are made in Step 214.

V. ANALYSIS

A. Ground 1: Kido Does Not Anticipate or Render Obvious Claims 1, 3-5, 7, 8, 10-12, 14, 15, 17, 18, and 20

1. Summary of Kido

107. Kido discloses a gaming machine for playing roulette. EX1007(Kido), [0080]. There are a number of player stations with screens that are arranged around an auto-roulette wheel. EX1007, [0114]. An example of the device is shown in Figure 3.



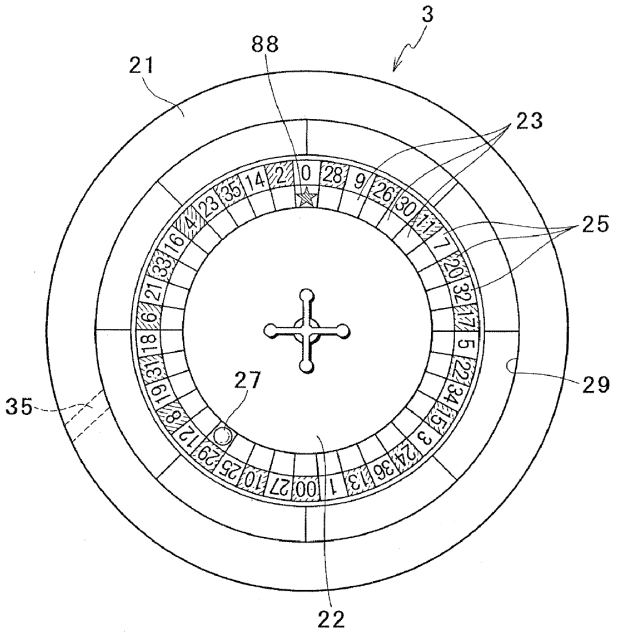
EX1007, Fig. 3.

108. In Kido's gaming system, Kido takes a standard game of roulette and modifies it to include two additional, unconventional features: a privilege and/or a side bet. For its base roulette game, Kido describes typical roulette wagers with typical roulette payouts. EX1007, Fig. 8. For example, see the "base odds" column in the table from Figure 8 of Kido.

ODDS TABLE CORRESPONDING TO A BET TYPE

BET TYPE	BASE ODDS	ODDS OF A STAR BONUS
STRAIGHT UP	35 : 1	71 : 1
SPLIT	17 : 1	35 : 1
STREET	11 : 1	23 : 1
CORNER	8 : 1	17 : 1
FIVE	6 : 1	13 : 1
DOUBLE STREET	5 : 1	11 : 1
COLUMN	2 : 1	5 : 1
DOZEN	2 : 1	5 : 1
COLOR	1 : 1	3 : 1
EVEN	1 : 1	3 : 1
ODDS	1 : 1	3 : 1
LOW	1 : 1	3 : 1
HIGH	1 : 1	3 : 1

109. Kido discloses four different privileges that can be awarded: Special Rate Award, Second Special Rate Award, Prog Bonus, and Free Spot Award. EX1007, Figs. 9, 11-13; [0015]-[0016], [0082]-[0083], [0185], [0195], [0209], [0220], [0235]. In these game modes, the game labels one number on the roulette wheel with a single designated mark that Kido calls a "special game value award mark." EX1007, [0082]. If the ball lands on the number that was selected as the special game value and a player bet on that number, the player is awarded the one implemented privilege from the four different privileges. In Figure 4 (below), a roulette wheel where the number '0' is the special game value and is labeled with a star mark to show that.



For example, Kido states that the controller "set[s], as a start [star] mark 88, a specific mark among the plurality of marks" ([0011]). Figures 1 and 4 depict the star mark as a single pocket on the wheel. Kido has no examples showing that multiple numbers can be assigned a star mark during a single round of play. Instead, every routine uses a single star mark. EX1007, [0021]-[0061].

110. Kido has four different privilege routines. Three of those routines (Special Rate Award, Second Special Rate Award, and Free Spot) award a privilege that applies only to the next spin of the roulette wheel and does not confer the player with any benefit for the current spin of the roulette wheel. EX1007, [0203]-[0204], [0217], [0243]. Only the last routine (Prog Bonus) awards a privilege on the current spin. When the Prog Routine is used, the game withholds

0.5% of all credits that are bet and puts them in a progressive jackpot that players can win. *Id.*, [0129], Fig. 3.

111. In Kido's main embodiment, the special game value award mark is set in advance, before a game starts. EX1007, [0195], [0209], [0221], [0235]. If the ball falls into the pocket that was given a special game value award mark and the player placed a wager on that number, the player is awarded a privilege. EX1007, [0082]-[0083]. Kido also discloses an alternative embodiment where the special value mark can be set after the ball is spun.

112. For all of the privilege routines, Kido discloses that the roulette payout for every position on the roulette wheel is the same on any single spin of the wheel. *E.g.*, EX1007, Fig. 8, [0083]. Kido does not disclose varying the roulette payout amongst different numbers on the wheel. Any modifications to payouts are fixed and predetermined. Kido does not disclose any variable modifications to payouts. *See, e.g.*, Figure 8 (star bonus column).

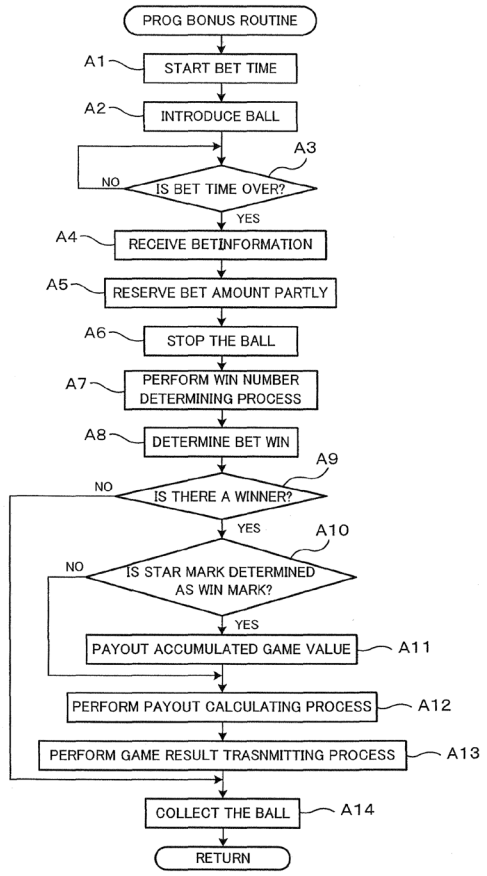
2. Claims 1, 8, and 15

113. Mr. Friedman asserts that Kido discloses the claimed step of "determine a first payout for the first position and a second payout for the second position for the spin of the roulette wheel, wherein the first payout is higher than the second payout." Mr. Friedman relies on steps A9 to A12 of the Prog Bonus

routine, which is shown in Figure 12 of Kido. EX1003, ¶¶159-67. I disagree for multiple reasons.

114. The steps of the Prog Bonus routine are specified in Figure 12 (below).

FIG. 12



115. In Steps A1 to A4, one round of the game starts, a ball is spun on the roulette wheel, and the system receives each player's bet information when bets are closed. EX1007, [0222]-[0227]. In Step A5, the system retains 0.5% of the amount bet to be added to the progressive jackpot. *Id.*, [0226].

116. In Step A6, the ball has stopped spinning and has landed in a pocket of the roulette wheel. In Step A7, Kido determines what number the ball landed on. *Id.*, [0228]. Kido uses one ball and one wheel. In any single game, the ball lands on one number. Therefore, in step A7, Kido will identify a single winning number.

117. In Step A8, the Prog Bonus routine determines whether any player bet on the winning number. In Step A9, if no one bet on the winning number, the process skips to Step A14, the ball is collected, and new round of the game started (looping back to Step A1). There was no winner, so no money is awarded to any players. In contrast, if a player did bet on the winning number, then Step A9 will proceed to Step A10.

118. In Step A10, the Prog Bonus routine determines whether the winning number also received the star mark. If no, then the routine skips ahead to Step A12 (described below). If the answer to Step A10 is yes, then the routine moves to Step A11 where the progressive jackpot is awarded to the player. The process then moves to Step A12. In Step A12, Kido awards the player a standard roulette payout, calculated using the "based odds (credit-number per one chip)" shown in Figure 8. EX1007, [0231].

119. In Step A13, the results are transmitted to the players. In Step 14, the ball is returned, and the process repeats, starting from A1.

120. The amounts paid in Steps A11 and A12 do not meet the claim element of "determine a first payout for the first single position and a second payout for the single second position for the spin of the roulette wheel, wherein the first payout is higher than the second payout." There are at least three reasons for that failure.

121. **First**, the progressive award made in Step A11 does not meet this claim element because a progressive jackpot is not a "payout" within the meaning of the claims. As I explained in the claim construction section above (§ IV.B.1), in roulette, a "payout" refers to the amount a player will win in relation to the amount wagered on, such as 35:1. Kido's progressive jackpot is different: it is simply the total amount that can be won regardless of the wager. The jackpot does not vary based on how much the player wagered that round. Whether the player wagered $1, $10, or $100, the jackpot is the same. This distinguishes the progressive jackpot award from a roulette payout, since roulette payouts scale with the amount bet on the winning number.

122. **Second**, the standard roulette payout made in Step A12 does not meet this claim element because every position on the roulette wheel has the same payout. No matter what number wins, the player would receive the standard roulette payout, calculated using the "based odds (credit-number per one chip)" shown in Figure 8. EX1007, [0231]; *id.*, [0083] (describing standard roulette

payouts as "based on the game value placed as a bet and a rate corresponding to the mark bet on"). Figure 8 shows that the base odds of a straight up bet (a bet on a single number) are 35:1.[3] There is no variability in the payout odds amongst numbers on a single spin of the roulette wheel.

123. **Third**, Kido does not determine a first payout and a second payout. Nor does it do so before the ball falls into an outcome position. In Step A6, the ball falls into a position on the roulette wheel, and in Step A7, Kido determines which number is the winning number. In a single game, there will be only one winning number. In Steps A11 and A12, Kido is only determining the award amount for a single number on the roulette wheel (the number the ball landed on). Kido does not determine what the award would be for non-winning positions if the ball had instead landed on a different number since its roulette payouts are constant. Therefore, Kido at most is determining a first payout. And that payout is determined only after the ball has fallen into an outcome position. Given Kido's design that uses standard roulette payouts for all spots, and adds a star privilege to one spot, there is no reason for Kido to determine a second payout.

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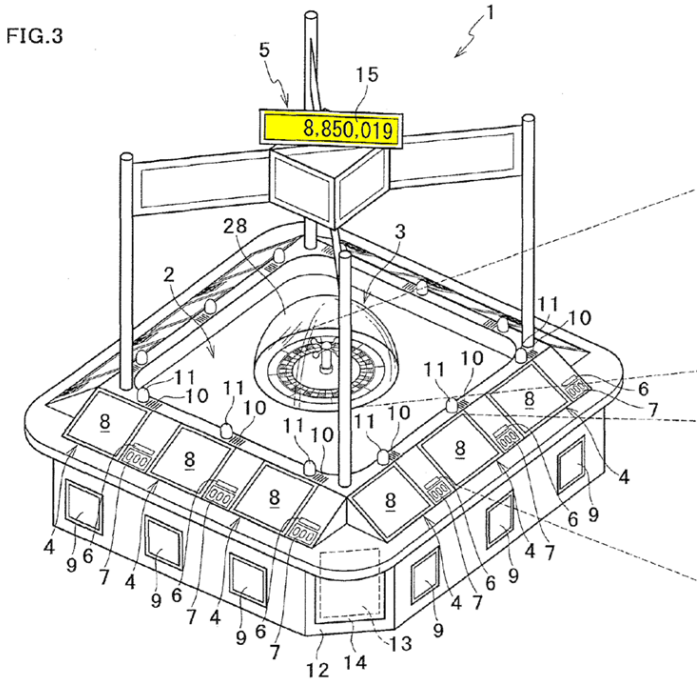
[3] Figure 8 also shows a second set of payout odds for the "Odds of a Star Bonus." Those odds apply only during the two Special Rate Routines, which require two spins of a roulette wheel. In addition, even when the Star Bonus odds apply, every position on the roulette wheel has the same payout odds (the Star Bonus odds). Therefore, there cannot be a first payout that is higher than a second payout.

124. These distinctions between Kido and the claims are significant from a game design point of view. The ’024 patent is directed to a game with dynamically determined variable payouts. After betting is closed, the game will select one or more numbers as lucky numbers and will determine a lucky payout for each number. Players get a sense of excitement if they bet on a number that is assigned a multiplier, and the excitement will further build because the player will recognize the possibility of an increased payout. Such a payout could range from for example, 49:1 to 499:1, creating significant new win possibilities on a single game of roulette and increasing the volatility of the game. Even if the player does not win, the experience from the dynamically determined payouts adds depth to the game and keeps players much more engaged since there is excitement offered during the traditionally low information phase of watching the ball spin.

125. Kido’s progressive jackpot does not provide the same kind of excitement as the ’024 patent’s payouts. Unlike roulette payouts, the progressive jackpot is not defined as 35:1 or 99:1 or 499:1. The progressive is simply the total amount of the jackpot. EX1007, [0226]. In Kido, if a player wins the progressive jackpot, the player receives the entire jackpot no matter how much was bet. EX1007, [0230]. After a jackpot is won, the jackpot becomes far less attractive to players because the entire jackpot is paid, and it resets to a lower base or seed amount. The progressive jackpot does not significantly vary between rounds of the

game. It increases by 0.5% of the amount wagered, so there is no per game excitement generated by the small and predictable increments. The jackpot amount also is known in advance so it does not need to be determined during a round of play and its value does not provide a sense of excitement.

126. Kido's progressive jackpot is intended to be used as an advertisement to draw players to the game. Many players find the possibility of winning a large jackpot to be exciting, even though it is unlikely that the player wins (similar to a state-run lottery). The jackpot is not designed to keep players engaged with the game and excited. Kido shows that its device includes a sign that displays the progressive jackpot (highlighted below) to potential players.



127. Kido's progressive jackpot is fundamentally different than the payouts in the '024 patent. The claimed systems and methods generate excitement by determining the value of the first payout for each spin of the roulette wheel and setting it to a value that is higher than another payout. The claimed systems and methods provide excitement though per-spin variability of the payouts. The variable rewards re-engage the player every spin and keeps players excited about the payout possibilities.

128. Kido has no reason to determine the payout for more than one number of the roulette wheel. The roulette payout made in Step A12 is always the same for every position on the wheel and is defined in Figure 8. In Step A11, the amount of the progressive jackpot is known in advance. Kido does not provide a mechanism for varying roulette payouts among different numbers on the wheel.

3. Kido Does Not Teach Claims 7, 14, and 24

129. Claim 7 depends from independent claim 1, and specifies:

> The system of claim 1, wherein the at least one hardware processor is further configured to:
>
> randomly select a second selected position on the roulette wheel; and
>
> determine a payout for the second selected position that is different than the payout for the first position.

130. Claim 14 depends from independent claim 8, and claim 24 depends from independent claim 15. Claims 14 and 24 include the same limitations as claim 7.

131. Claims 7, 14, and 24 require the game to select a second number on the roulette wheel to receive an increased payout and for that payout to be different than the first payout. For example, the first payout could be 99:1 and the second payout could be 49:1.

a) A POSA Would Not Have Modified Kido as Mr. Friedman Proposes

132. Relying on a comment in Kido that "privileges may be combined," Mr. Friedman asserts that it would have been obvious to modify Kido so that a player could win two different privileges during a game by putting star marks on two different numbers. EX1003, ¶190. I disagree.

133. Mr. Friedman does not explain what two privileges would be used together. Because Mr. Friedman relied on the Prog Bonus routine for claims 1, 9, and 17, presumably he intended for the Prog Bonus routine to be one of them. Mr. Frieman has not identified which of the Special Rate Award, Second Special Rate Award, and Free Spot Award privileges would be added.

134. A POSA would not have had reason to modify Kido to offer two (or more) privileges per round as Mr. Friedman asserts. That is because each of

Kido's privilege routines suffer from multiple problems including small awards at high cost to the house. A POSA would not have wanted to use those routines together or at all since they offer poor value and combining them would compound these issues without providing a clear upside. A POSA would understand that frequent low impact bonuses are unpopular with many players that resent celebrating consistently small wins.

135. First, Kido's two Special Rate routines are easily exploitable, and if those routines were available to players, the game operator would lose money. The routines can be exploited by taking advantage of the fact that in the normal game, straight up bets pay 35:1, and in the bonus game, straight up bets payout at 71:1. The exploit works as follows:

- A player bets $1 (or whatever the minimum bet is) on every number. The player is guaranteed to win because he has bet on every possible number. The player loses -$2 per spin ($38 is wagered, the player wins $35 and keeps $1).
- When the ball lands in the same pocket as the star mark, the bonus game is triggered where the payout on a winning straight up bet is 71:1. The player bets $10 (or whatever the maximum bet is) on every number. The player will be guaranteed to win, which pays out $720. The player profits $340 ($720-$380).

- If we assume 1 minute per round of play, then this would amount to close to a $10 loss per minute on average per player, assuming a typical bet structure for a live product. A POSA would recognize that having more than one exploitable per hour, on average, makes this very attractive to a player that seeks to exploit the design and creates a heavy burden on operators that do not wish to lose money on a product.

136. Because the Special Rate routines are exploitable, a POSA would have been motivated to remove those routines from Kido. A POSA would not have been motivated to combine use of the Special Rate routines with any other privilege routine.

137. Second, for the Prog Bonus and Free Spot routines, Kido does not offset the privilege by decreasing any of the payouts. Each of the routines disclosed by Kido would eat into the operator's narrow profit margins. Consequently, a POSA would not have been motivated to include both privileges on each spin because that would further decrease the operator's margins. In some cases the decrease is more than linear with combined privileges.

138. When modifying traditional games to add a new game element, game designers balance an advantage provided to the player with an advantage provided to the house to balance the edge. EX2044(Lubin), 15. Advantages provided to players must be paid for with "a rule or ploy that counter-balances the edge

percentage given away – and conceal it from the gambler's view" so the gambler focuses on the benefit and not the loss. EX2044(Lubin), 15. If a game fails to achieve this balance that allows games to be profitable for gaming operators, they will not buy and offer that game to players.

139. Using traditional roulette rules, the house margin is 2.7% on European roulette and 5.26% on American roulette. Kido's Prog Bonus routine takes a percentage of every wager (0.5%) and puts it into a progressive jackpot. That means that if the player loses, the casino receives 99.5% of the player's wager and the 0.5% stays in the progressive jackpot. This brings the house margin to 3.2% and 4.76%, reducing it by 18.5% on European roulette and by 9.5% on American roulette. Kido does not show decreasing any payouts to compensate for that loss. The game is unbalanced in that it fails to pay for the Prog Bonus by making a different rule or payout more favorable to the house.

140. Kido does not state whether its progressive jackpot is seeded. A POSA would have understood that both in the scenario where it is seeded and in the scenario where it is unseeded, Kido's progressive feature would have been unattractive to a game designer.

141. Kido describes the progressive jackpot consistent with how such a feature was commonly understood. Kido's Figure 3 shows the progressive jackpot

is ¥8,850,019, which at an exchange rate of ¥120 to $1,[4] is approximately $75,000. Figure 3 also shows a sign prominently displayed at the top of the gaming device advertising the progressive jackpot's value to potential players. The jackpot's size would have been intended to provide excitement to players and to draw players to the game.

142. Kido's progressive jackpot likely was intended to be seeded. A POSA would have known that progressive jackpots typically are seeded with an initial award amount so they do not start at $0 after a win. If the progressive started at $0, it would not be able to draw players in or create excitement. A POSA also would have known that most jurisdictions have regulations that require operators to seed a progressive jackpot. Literature documents that common seed amounts for progressive jackpots are $2,000 to $25,000, which is consistent with my experience. EX2044(Lubin), 181. Kido contemplated that the jackpot would reach into the tens of thousands of dollars. Providing an initial seed amount of $2,000 is a small proportion of that value. A POSA may have considered other seed amounts based on some multiple of the average wager amount of the table.

[4] In April to May 2007, the exchange rate was approximately ¥120 to $1. https://fred.stlouisfed.org/data/exjpus

143. Even with just one star mark, in practice, offering Kido's progressive likely would result in the game operator losing money. Under the typical practice which is required by most jurisdictions, each time Kido's progressive jackpot was won and paid, the game operator would have deposited a seed amount into the jackpot. Even with a seed value of a few hundred dollars would greatly exceed the gaming operator's expected profit from Kido's game. No gaming operator would have bought and offered a game like Kido's that is guaranteed to lose money. Kido's failure to change any rules or award amounts to offset the progressive would have dissuaded a POSA from wanting to use the Prog Bonus routine. If Kido were modified to have two star marks, that would double the probability of a player winning the jackpot, which would mean the seed value would need to be paid more frequently. This would cause even more losses to the operator. A POSA would not have been motivated to make such a modification.

144. In the scenario where Kido's progressive was not seeded, the progressive jackpot would not have been able to grow to a sufficient size to impact the player experience. It also would have been atypical to offer a progressive without funding it with a seed amount. The probability that the roulette ball lands in the same pocket that has the star mark is 1 in 38 (when there is one star mark). Depending on the number of players (Kido shows a game with 12 player stations)

and the number of wagers each player makes each game, the probability that all, or most, of the numbers have a wager on them can be high.

145. The probability of the condition for winning the jackpot (the ball lands on the number with the star mark) is relatively high for a progressive system. The following analysis is based on an American roulette wheel. With one star mark, there is a 1 in 38 chance the ball will land on the star mark each spin of the wheel. There is a 50% chance this happens within 26 spins, a 75% chance within 52 spins, and a 95% chance within 112 spins. If a second star mark was added, there is a 1 in 19 chance of the ball landing on the star mark. This cuts the expected frequencies in half: there is a 50% chance the ball will land on the star mark within 13 spins, a 75% chance within 26 spins, and a 95% chance within 56 spins.

146. To understand the probability of the jackpot being hit and the size of the jackpot, it is helpful to consider several examples.

- Example A: 12 players, each player bets $1 on five different numbers. There are 60 total wagers each game, and $60 total is wagered. $0.30 will be added to the progressive jackpot each game. It is highly likely that every or nearly every number has at least one wager on it. With one star mark, assuming every number has a wager on it, the probability of someone winning the jackpot is 1 in 38.

- Example B: 12 players, each player bets $1 on one number. There are 12 wagers and $12 is wagered. $0.06 is added to the jackpot each game. Assume 12 different numbers are bet on. With one star mark, the probability of someone winning the jackpot is 3 in 361.
- Example C: 1 player bets $1 on one number. The total amount wagered is $1, and $0.005 is added to the progressive jackpot each game. With one star mark, the probability of winning the jackpot is 1 in 1,444.

147. In Example A, with one star mark, that means approximately 50% of the time the progressive will be won within 26 spins, resulting in a progressive jackpot that is $7.80 or less. This amount is around 20% of a straight up pay. With a $1 bet, a player expects to win $36 from a straight up bet. A progressive that added a flat $7 to that would not be attractive to players. Adding a second star mark would have further reduced the average jackpot size. In that configuration, approximately 50% of the time, the progressive jackpot would be less than $3.90, or approximately 10% of a straight up pay.

148. In Example B, with one star mark, that means approximately 50% of the time the progressive will be won within 84 spins, resulting in a progressive jackpot of about $7.22 on average, about 20% of a straight up pay. For Example C, the median spins to hit the jackpot increases to 1000, but the average award remains $7.22. Like Example A, adding a second star mark cuts the average award

in half, reducing the average award to about one tenth of a straight up pay. Such a jackpot would be insignificant for a player. It seems unlikely that Kido intended jackpots to be this small as Kido's game prominently displays a jackpot meter at the top of the game to advertise it. A jackpot between $3 and $8 is not compelling, and is far less than the approximately $75,000 (¥8,850,019) jackpot shown in Kido's Figure 3.

149. Kido discloses that the 0.5% accumulation rate is exemplary, allowing for other amounts to be used. EX1007(Kido), [0226]. The accumulation rate could not be significantly increased because doing so would eat into the house margin. Increasing the accumulation rate by a factor of 5 to be 2.5% would eat almost the entire margin for European roulette and half of the margin for American roulette. Even then, the jackpot (between $15 and $35) still would not high enough to be attractive to players.

150. A POSA would not have modified Kido's progressive jackpot to include a second star mark because that would have made it less attractive to players. Progressive jackpots are attractive to players because they are expressed as a dollar amount and are often hundreds, thousands, or even millions of dollars. Games typically prominently display the progressive jackpot amount to players as an advertisement to draw players to the game (*e.g.*, as in Kido's Figure 3). Because Kido's jackpot will be triggered too frequently, without a seed amount, it

is extremely unlikely that Kido's progressive jackpot could ever reach a thousand dollars or more. The second star mark would double the probability of hitting the progressive, meaning its size would be even lower and less attractive to players. A game designer would not want to use the Prog Bonus routine nor modify it to have two star marks.

151. Importantly Kido's privilege gives away 0.5% house edge at the cost of complicating play for a small variable award that would be unimpressive to players. Operators would need to take extra steps to ensure compliance with regulations covering progressives. The excitement of progressives comes from them representing the largest awards, hundreds or thousands of times the typical award, or even millions of dollars, rather than a small fraction of a typical award. Kido's Prog Bonus configuration would not be attractive to game operators.

152. Kido's Free Spot routine gives a player extra wagers, *e.g.*, 10 chips on four different numbers. EX1007, [0243] ("a free spot in which 10 chips are made to be bet is randomly selected from the numbers ("0", "00" and "1" to "36") indicated on the numbered plates"). These wagers are given to the player for free. Kido does not show decreasing any payouts to compensate the operator for that loss, making it undesirable as a product for reasons previously discussed.

153. From a game return perspective, adding 10 chips on the next spin equates to awarding the player less than ten times their bet on that number that

earned the privilege since its value is decreased by the house advantage. If we assume the embodiment where the star mark is placed randomly, then this feature is modestly estimated to pay about 0.65%, which is over 12.5% of the total house edge for a small upside that would not significantly change the experience of a typical player that takes risks of that magnitude on each play. For the profitability of the European version of roulette, the low estimate has this feature taking about 27% of the house edge.

154. From a game design perspective, it further has the disadvantages to the player that they are forced to play again, which is not always convenient or desired, and that they do not get to choose their bet spot on the next spin. So, the mild upside is offset by a significant downside to the player. Beyond that, the bonus would rarely pay anything. One spot gives a 1 in 38 chance of awarding anything, which is a very low hit rate for an awarded privilege.

155. From the perspective of the house, there are also multiple disadvantages for the privilege that is not significant to the player. Bonuses that are awarded on a next play always present the risk of extreme inconvenience if there is a malfunction, a large pay that triggers a hand pay, or some other reason that interrupts the flow of play, which can be frequent. In the case of a long delay, the house must find a way to satisfy customers for their practical loss of privilege.

The potential to award nothing as a result of a privilege is also prohibited by regulatory standards in some jurisdictions.

156. A deeper design problem is that the trigger and the free spot win condition are somewhat redundant with each other in a way that creates ambiguous interactions. For example, if the free spot bet triggers the privilege again, does it choose a new free spot with 100 chips bet? And then 1000 chips bet if it happens again? A cleaner design would specify unambiguous rules for every combination of outcomes. As written, the feature could create a very large liability for a casino depending on how the Free Spot privilege retrigger is handled.

157. When game designers modify traditional casino games, they consider the game both from the player's point of view and the operator's point of view. When games are modified to provide a player with privileges or advantages, other aspects of the game typically are modified in favor of the operator to balance out. For example, in the traditional game of blackjack, most payouts are 1:1 but a blackjack has a payout of 3:2. When blackjack is modified to provide players with an advantage (e.g., free double down), other rules are modified for the operator. For example, the blackjack payout is reduced to 6:5, or if the dealer gets a 22 (which traditionally means the dealer busts and the player wins), it is a push instead of a player win. With table games these changes to payout odds are a topic of interest and dispute with players, so the decision to change payouts is done at a

risk of alienating players. Players may find some adjustments made in favor of the house to be unacceptable and reject games for that reason.

158. Neither the Prog Bonus routine nor the Free Spot routine balances the advantage to the player with an advantage to the operator. This would reduce the profitability of the game. The house margin for European roulette is 2.7%, and for American roulette is 5.26%. The Prog Bonus reduces the house's take by 0.5%, eating into a small margin. Combining it with the Free Spot routine would further reduce the house margin per spin. Choosing how to balance the privilege with a house-favorable rule is not a simple decision. It is an important design decision that can be difficult to make. For example, a POSA would have recognized that reducing a base payout rate for roulette bears risk as a design decision because a typical player will be aware of the reduced return relative to those bets. Likewise, adding another house favorable pocket (*e.g.*, a '000') can also dissuade players. A POSA would not have combined the Prog Bonus and Free Spot routines because operators would be unwilling to run such a game with reduced house margins for ineffective bonus mechanics.

b) <u>Kido Does Not Show Combining Privileges as Mr. Friedman Argues</u>

159. Kido does not disclose any embodiments where two positions on the wheel are selected to have a star mark. Mr. Friedman relies on Kido's statement

that "privileges may be combined" to assert that it would have been obvious to modify Kido to select two different numbers to get star marks. EX1003, ¶190. Kido's comment about combining privileges does not suggest selecting multiple numbers to get a star mark. If it suggests anything, it would be that one star mark can award multiple privileges.

160. Kido does not suggest that a single privilege could be offered with more than one star trigger available to access it since the act of combining multiple elements does not typically include copying them as well. Therefore, "privileges may be combined" is not reasonably interpreted as "one privilege may be triggered by multiple stars."

161. Even if a POSA were to have modified Kido so that two numbers are selected to receive a star mark each providing a different privilege, Mr. Friedman has not shown that including two privileges on the same spin meets the claim language. The only privilege that happens on the same spin is the progressive jackpot, so combining that with any other stated privilege does not constitute designating a second payout.

162. For the "first selected position" and "first payout" elements of the independent claims, Mr. Friedman relied on the Prog Bonus routine. Mr. Friedman asserted that the progressive jackpot met the "first payout" element (I disagree for the reasons stated in § V.A.2., above). For the "determine payout for the second

selected position" element of claims 7, 14, and 24, Mr. Friedman does not identify any determination made by Kido. EX1003, ¶191. He simply states that the payouts "could only be the same or different," and it would be obvious to choose for them to be different. EX1003, ¶191. I disagree. In the other three privilege routines (two Special Rate routines and Free Spot routine), all positions on the roulette wheel have the same payout. In the Special Rate routines, it is the Star Bonus Odds in Figure 8, and in the Free Spot routine, it is the Base Odds in Figure 8. None of those routines determines a payout for a position that is different than any other payout. There is no reason to modify those to make the payouts different. In addition, as I explained above in § V.A.2 (*e.g.*, ¶123), the only number Kido calculates a payout or award for is the winning number. Kido does not show determining a second payout for any number.

4. Claims 3-5, 10-12, and 17-18

163. Claims 3-5, 10-12, and 17-18 all depend from one of claim 1, 8, or 15. These claims are not anticipated or obvious based on Kido for the same reasons as the independent claims from which they depend.

B. Ground 2: Kido and Yee Do Not Render Obvious Claims 2, 9, and 16

164. Mr. Friedman asserts that Claims 2, 9, and 16 of the '024 patent would have been obvious based on the combination of Kido and Yee. Yee does

not make up for the deficiencies of Kido with respect to the independent claims, and therefore the combination fails for these claims as well.

C. Ground 3: Baron Does Not Anticipate or Render Obvious Claims 1-5, 7-12, 14-18, and 20

1. Summary of Baron

165. Baron is entitled "Methods of Administering Wagering Games of Roulette with Progressive Side Wagers." It describes several versions of a roulette table that allow Baron's modified roulette game to be played. One of the features of Baron's modified game is that players can win a progressive jackpot. EX1008, [0001]. Baron's progressive jackpot system relies on the use of three roulette wheels for each game, and each wheel is spun during a game. *Id.*, [0028]. Each wheel has its own ball, and the result from each wheel is independent of the others. *Id.*, [0038].

166. Baron shows an example of a table for his game in Figure 4, which is below.

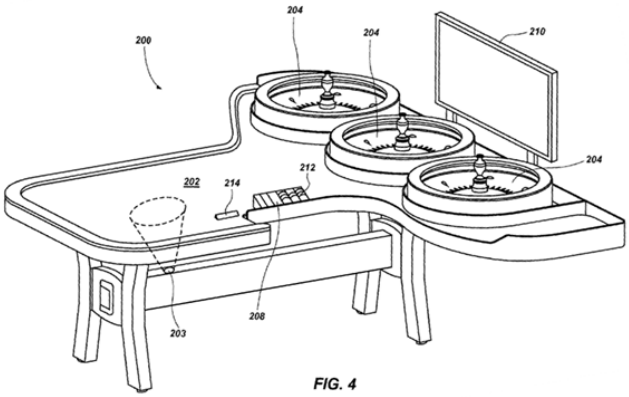


FIG. 4

Baron discloses that the game can be played with physical wheels and an in-person croupier as shown above. *Id.*, [0040], [0082]. Instead of physical wheels, Baron

states the game can be played using virtual roulette wheels. *Id.*, [0027] (describing a "virtual table" and "virtual croupier"), [0082] (describing use of "physical roulette wheels" or "virtual roulette"), [0089] (describing use of "virtual roulette wheels").

167. Players can make conventional roulette wagers on Baron's table, which would be resolved according to standard roulette rules. EX1008, [0038]. Players can also make a bonus wager or progressive wager, which allows the player the potential to a progressive jackpot. EX1008, [0028].

168. When a player makes a progressive wager a different set of rules applies. All three roulette wheels are spun. A player can win if any of the three spins lands on the number the player wagered on. *Id.*, [0043]-[0044]. Players can win different amounts depending on whether one, two, or all three wheels land on the same number the player wagered on. For example, a player will win 7:1 if one roulette wheel lands on the number the player wagered on, 100:1 if two roulette wheels land on the same number, and the entire progressive jackpot if all three wheels land on the same number the player wagered on. EX1008, [0045].

169. Baron presents the results of all three spins to users. All three roulette outcomes are used to resolve the game. An example display is depicted in Figure 3, which shows that all three wheels landed on 24.

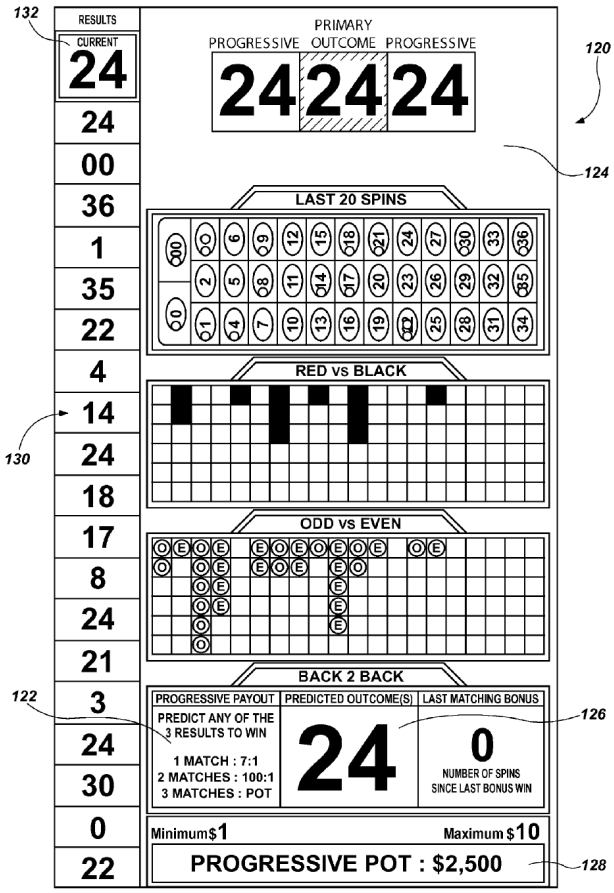


FIG. 3

2. Claims 1, 8, and 15

170. Claims 1, 8, and 15 all include a number of limitations regarding actions that must be taken during the same spin of a roulette wheel. For example, Claim 8 includes the following limitations

> receiving, using a hardware processor, first bet information for a first bet from a first player device of a first player ***on a spin of a roulette wheel***, the first bet information corresponding to at least a first position on the roulette wheel;

receiving, using the hardware processor, second bet information for a second bet from a second player device of a second player ***on the spin of the roulette wheel***, the second bet information corresponding to at least a second position on the roulette wheel that is different from the first position;

determining, using the hardware processor, that the roulette wheel and a ball on the roulette wheel have been spun ***for the spin of the roulette wheel***;

randomly selecting, using the hardware processor, a first selected position on the roulette wheel ***for the spin of the roulette wheel*** prior to the ball falling into a position on the roulette wheel, wherein the first selected position is the same as the first position;

determining, using the hardware processor, a first payout for first position and a second payout for the second position ***for the spin of the roulette wheel***, wherein the first payout is higher than the second payout;

determining, using the hardware processor, that the ball has fallen in the first position ***for the spin of the roulette wheel***; and

indicating, using the hardware processor, that the first player is to be paid at the first payout ***for the spin of the roulette wheel***.

171. **First**, Baron does not meet these claim elements, which all specify "for the spin of the roulette wheel." I understand the Board construed this term to mean "one spin of one roulette wheel." Inst. Dec., 9. Each game, Baron spins all

three roulette wheels. When players make a progressive wager, there is no action that occurs for a spin of a roulette wheel. The wagers are made on multiple wheels, three roulette outcomes are generated (three balls fall into a position on their respective wheels), and any amounts won are for multiple spins. Therefore, none of Baron's steps are for "one spin of one roulette wheel."

172. In his declaration, Mr. Friedman states that "Baron explains that the plurality of roulette outcomes are 'generated in a single round of the wagering game.'" EX1003, ¶251. While true, that does not change the fact that three different roulette wheels are spun each game and that the plurality of outcomes results from an extra wager.

173. **Next**, Baron does not meet the claim elements requiring "randomly selecting, using the least one hardware processor, a first selected position on the roulette wheel for the spin of the roulette wheel prior to the ball falling into an outcome position on the roulette wheel." Although Mr. Friedman does not identify what the alleged "first selected position" is, it appears he intended to assert that the outcome on one of the roulette wheels is the "first selected position" while the outcome on a different roulette wheel is "the ball falling into an outcome position" element.

174. Mr. Friedman's theory for the "first selected position" does not meet the claims. Baron generates three roulette outcomes by spinning three wheels. A

player can win if any of the three roulette outcomes are a number the player bet on. Although Mr. Friedman labels the wheels, asserting one is the primary wheel and two are ancillary wheels, that does not change the fact that each roulette wheel generates a roulette outcome by a ball falling into an outcome position (whether physically or virtually). Mr. Friedman's theory is that Baron selects the position ***when*** a ball falls into an outcome position on a roulette wheel. Therefore, none of the roulette outcomes in Baron can meet the limitation of selecting a position ***before*** a ball falls into an outcome position.

175. **Next**, Baron does not disclose the claimed "[first | second] bet information corresponding to only a single [first | second] position on the roulette wheel." Baron's progressive wagering game is part of a side bet. Players must make a separate progressive wager in order to play the game. Baron uses multiple bets, a conventional wager plus a separate progressive wager. Baron uses a different game design than what is claimed. In the game covered by the claims, simply making a straight up bet is sufficient and the position bet on could be selected to have an increased payout. A side wager is different, and is an optional feature that players may use, but only by making an extra wager. Thus, it does not meet these claim elements.

176. **Next**, Baron does not disclose "determin[ing] a first payout for first position and a second payout for the second position for the spin of the roulette

wheel, wherein the first payout is higher than the second payout." For any one spin of a roulette wheel, Baron's payouts are the same. If the player wagers on a number, and the ball lands on that number on one roulette wheel, the player wins a payout of 7:1. EX1008, [0045]. The amount the player wins does not vary based on which of the 38 numbers the player wagered on. For any one spin of one roulette wheel, the payout for a first position on that wheel and a second position on that wheel would be the same. There is not a first payout that is higher than a second payout.

177. The only way a player can obtain a higher payout is based on the results from two spins of two roulette wheels. EX1008, [0045]. Two roulette wheels must have their ball land on the number the player wagered on for that player to win a payout of 100:1. Such an increased payout is not available for "a spin of the roulette wheel," and therefore, Baron does not meet the claims.

178. Baron also discloses that, if all three wheels land on the same number, the player can win a progressive jackpot. EX1008, [0045]. Winning the progressive jackpot requires three spins of three roulette wheels, not "a spin of the roulette wheel." As I explained in § IV.B.1 above, a progressive jackpot is not a "payout" within the meaning of the claims.

3. Claims 7, 14, and 24

179. Claim 7 depends from independent claim 1, and specifies:

> The system of claim 1, wherein the at least one hardware processor is further configured to:
>
> randomly select a second selected position on the roulette wheel; and
>
> determine a payout for the second selected position that is different than the payout for the first position.

180. Claim 14 depends from independent claim 8, and claim 24 depends from independent claim 15. Claims 14 and 24 include the same limitations as claim 7.

181. Claims 7, 14, and 24 require the game to select a second number on the roulette wheel to receive an increased payout and for that payout to be different than the first payout. For example, the first payout could be 99:1 and the second payout could be 49:1.

182. Mr. Friedman asserts that Baron meets these claims because "Baron discloses that a processor generates a plurality of roulette outcomes, which means Baron discloses randomly selecting a second selected position as well as a first selected position." EX1003, ¶292. Mr. Friedman does not explain why generating multiple "roulette outcomes" requires selecting both a first and second position for

increased payouts. As I explained in ¶¶172-74, above, a ball landing in an outcome position is different than selecting a position for an increased payout.

4. Claims 3-5, 10-12, and 17-18

183. Claims 3-5, 10-12, and 17-18 all depend from one of claim 1, 8, or 15. These claims are not anticipated or obvious based on Baron for the same reasons as the independent claims from which they depend.

D. Objective Indicia of Non-Obviousness

184. L&W's obviousness arguments also fail because there is overwhelming objective evidence of non-obviousness for Evolution's claimed invention. This includes extensive industry praise, including from L&W itself, L&W's copying of Lightning Roulette, and commercial success.

1. Industry Praise

185. Evolution's Lightning Roulette game was released in 2018. The game met with substantial acclaim in the industry. The year of its release, it won several prestigious industry awards, including:

- "Product Innovation of the Year" at the 2018 Global Gaming Awards. In the press release, Lightning Roulette was called "the most revolutionary product in the last 12 months." EX2007. The GGA describes the Product Innovation of the Year award as "one of the most prestigious awards" it offers. EX2038.

- "Product Innovation of the Year" award at the 2018 Global Gaming Expo (G2E). Lightning Roulette beat nine other shortlisted candidates. EX2037.
- Game of the Year at the EGR Operator Awards in 2018 and recognized as the game "making the biggest annual impact." The EGR Operator Awards are considered the "Oscars of the egaming sector" and reward operators for setting the [industry] standard." The Game of the Year winner is decided by votes by peer operators who were shortlisted for one of the awards.

186. Lightning Roulette was introduced into the US market in late 2021 to early 2022. It won 2022 Game of the Year at the American Gambling Awards. EX2009, EX2010.

187. The petitioner in this case, L&W, has itself praised Lightning Roulette. In a May 2021 press release, L&W's then Senior Vice President of Global Systems and Table Games praised Lightning Roulette, stating:

> We have watched ***Lightning Roulette's phenomenal success*** in a live-dealer, online format and cannot wait to make it available on gaming floors of land-based casinos across North America and around the world. With its trademark lightning strikes and ***big-win multipliers***, Lightning Roulette is sure to be one of the most visually engaging and entertaining live table games ever offered. It provides ***a truly unique roulette experience*** for players and we are confident that in its land-based form, scheduled for go-live in 2022, it will be an absolute star attraction.

EX2008; EX2039.

2. Copying

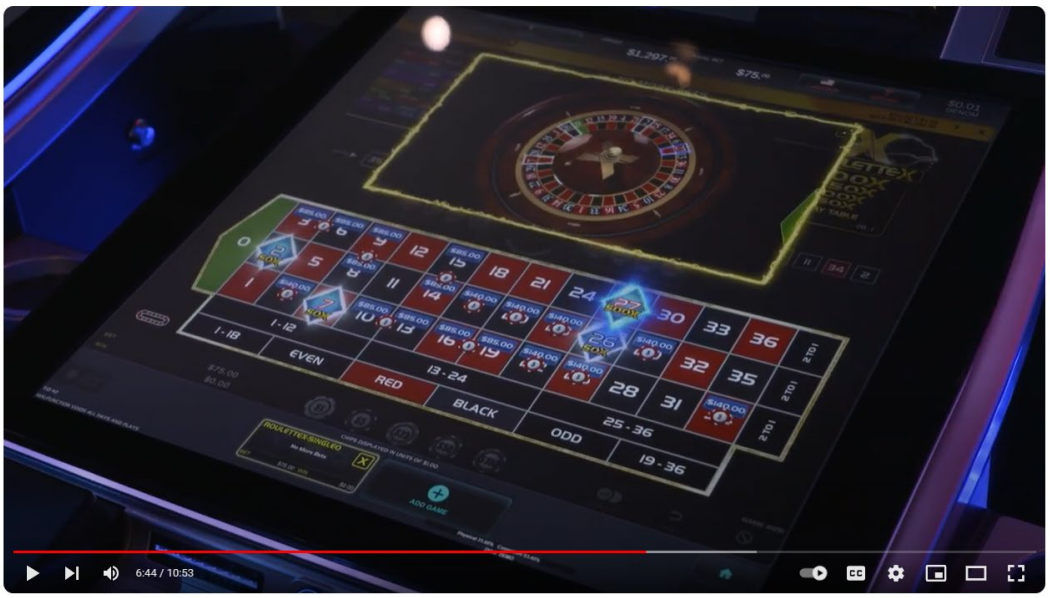
188. I understand that in March 2021, Evolution and L&W entered into an agreement where L&W agreed to develop a table version of Lightning Roulette for Evolution. As part of the agreement, L&W received a license to the ’024 patent. L&W terminated that agreement later in 2021 without ever developing a table version of the game for Evolution.

189. After terminating the license, L&W launched a copycat version of Lightning Roulette called RouletteX. EX1015, ¶¶17-23. L&W copied Lightning Roulette for RouletteX. Just like Lightning Roulette and the ’024 patent claims, L&W’s RouletteX randomly adds multipliers to several roulette numbers each time the roulette wheel is spun such that, if one is hit, players are awarded various increased payouts. L&W has described the game as follows:

Description

Welcome to Roulette X, an exhilarating, supercharged bonus roulette experience that has already become a renowned brand in land-based casinos worldwide! A definite crowd-pleaser, Roulette X adds an exciting twist to the classic casino game. Players have the power to choose their own volatility or bonus level, unlocking the potential to win an incredible 1000x! With each spin of the wheel, the excitement builds as up to five numbers are randomly selected to bear multipliers of 50x, 100x, 250x, or an astounding 1000x - Which level will you choose?

190. An example of a user interface for RouletteX that was presented at the G2E industry event is below. Four numbers were selected as Lucky Numbers—three were assigned increased payouts of 50X, and one was assigned an increased payout of 500X.



G2E 2023 Light & Wonder - At-Booth Product Demos

191. That game is a copy of Lightning Roulette and of the inventions claimed in the ’024 patent.

3. Commercial Success

192. The ’024 patent has met with commercial success. L&W’s former Senior Vice President of Global Systems and Table Games admitted that Lightning Roulette was a “phenomenal success.” EX2008.

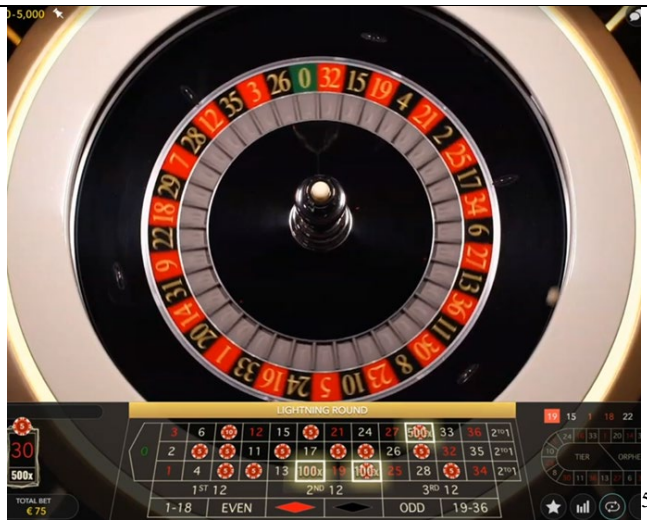
193. In addition, L&W took a license to the ’024 and ’014 patents and agreed to pay a royalty on products developed under the license. EX2014, 4, 6, 29.

That Evolution licensed the ’024 patent to L&W shows that the patent was commercially successful. *Ancora Techs., Inc. v. Roku, Inc.*, 140 F.4th 1351, 1362 (Fed. Cir. 2025) (explaining that “[a]ctual licenses to the patented technology are highly probative” and “do not require a nexus with respect to the specific claims at issue” because “they are, by their nature, directly tied to the patented technology”).

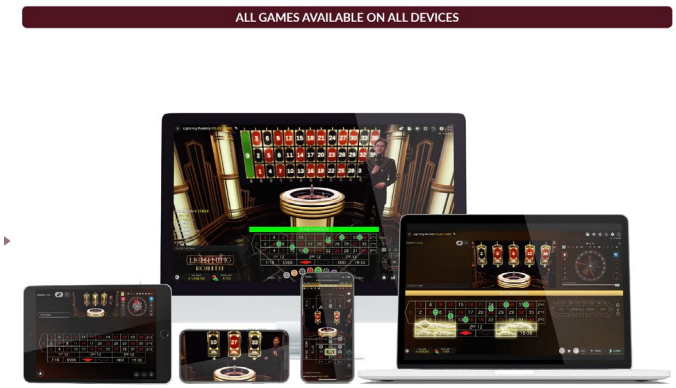
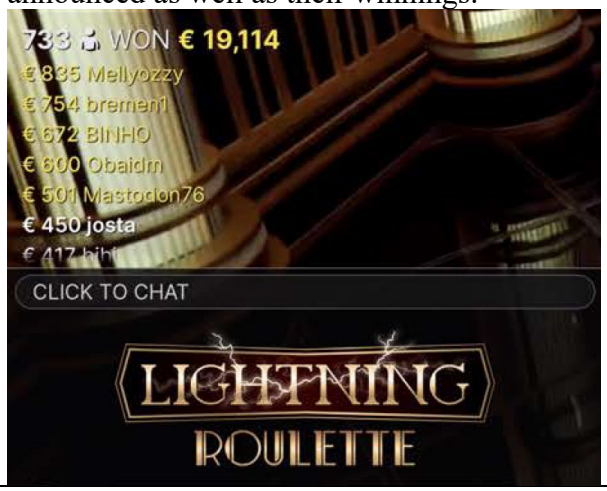
4. Lightning Roulette Has a Nexus with the Claims

194. Evolution’s Lightning Roulette product practices and embodies claims of the ’024 patent. For example, images of the Lightning Roulette game appear as Figures 3 to 5 of the patent. And, as shown in the chart below, Lightning Roulette practices at least claims 1, 4, 5, and 7 of the ’024 patent. Lightning Roulette also practices the parallel method and computer-readable medium claims (8, 11, 12, 14 and 15, 17, 18, 20) for the same reasons.

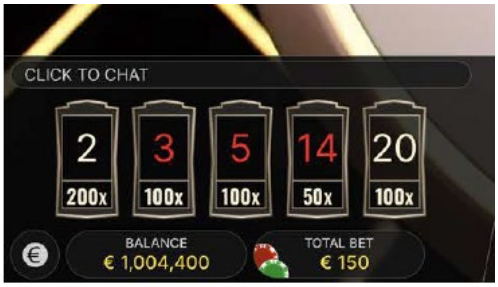
Claim Element	**Lightning Roulette**
1[pre] A system for wagering, comprising:	“Lightning Roulette is a unique, ground-breaking extended Roulette game that combines Live Casino with a high-payout RNG (Random Number Generator) element to revolutionise your Live Casino.” EX2027, 1.
1[a] a roulette wheel;	“All the familiar elements of our world-class Live Roulette are here — ***the live wheel***, the live dealer, the full line-up of Roulette bets.” EX2036.

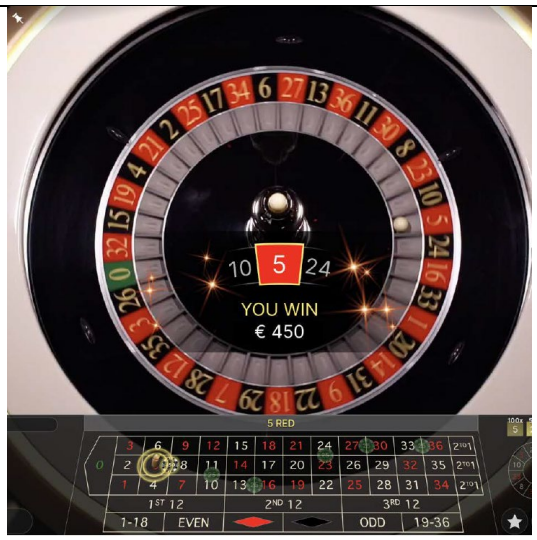
	 [5]
1[b] a ball configured to be used in the roulette wheel;	See 1[a], above.
1[c] a hardware processor configured to:	The game is run by a server (which includes a processor), and is broadcast to player devices.

[5] *See* https://games.evolution.com/wp-content/uploads/2023/01/Lightning-Roulette-Big-Win-Compilation.mp4

	 EX2027, 9.
1[d] receive first bet information for a first bet from a first player device of a first player on a spin of the roulette wheel, the first bet information corresponding to at least a first position on the roulette wheel;	The game has a user interface where each player can place bets from their own device (e.g., computer), including straight up bets on individual numbers. "***After all player bets are accepted***, the amount of Lucky Numbers (one to five), the Lucky Numbers themselves and the amounts of the Lucky Payouts are randomly generated." EX2036. The game receives bet information from every player. For example, the figure below shows that all winners are announced as well as their winnings. 

	EX2027, 3.
1[e] receive second bet information for a second bet from a second player device of a second player on the spin of the roulette wheel, the second bet information corresponding to at least a second position on the roulette wheel that is different from the first position;	See 1[d], above. "Thanks to massive multiplayer scalability, Lightning Roulette can be played by ***a virtually unlimited number of concurrent players***." EX2036
1[f] determine that the roulette wheel and the ball have been spun for the spin of the roulette wheel;	"The ball is spun ***automatically*** by an Auto Roulette wheel and the game presenter will pull a lever to initiate the generating of Lucky Numbers after betting time has expired." EX2027, 3.
1[g] randomly select a first selected position on the roulette wheel for the spin of the roulette wheel prior to the ball falling into a position on the roulette wheel, wherein the first selected position is the same as the first position;	"In every game round, ***between one and five Lucky Numbers are generated at random*** and struck by lightning. At the same time, each of the generated Lucky Numbers has a random multiplier applied to it: 50x, 100x, 200x, 300x, 400x or 500x. Naturally, this creates considerable extra suspense and excitement as each round spins by." EX2027, 2. "Our unique Lightning Roulette is like no other Roulette game. Not only is it visually stunning, it also adds RNG Lucky Number wins to every game round." EX2036 As shown in 1[i], below, the first selected position can be the same as the first position the first player wagered on. For example, in the image below, the player placed a $5 wager on 30, and 30 was selected as a Lucky Number with a 500x payout. The ball (on the right side of the image) is still spinning and has not fallen into a position yet.

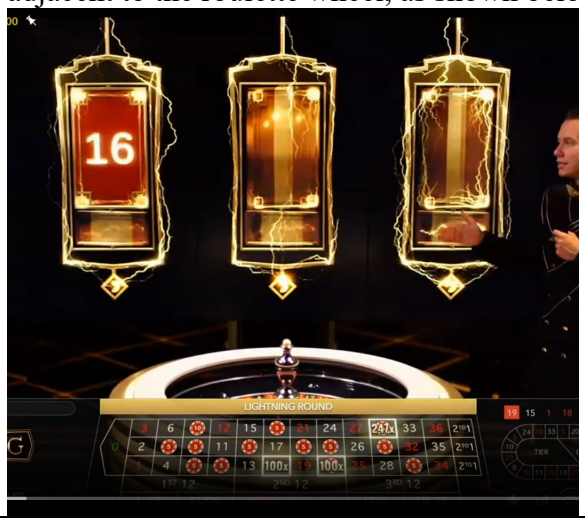
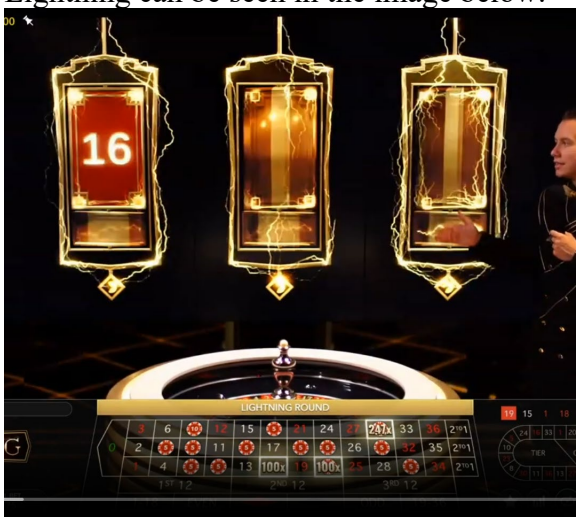
1[h] determine a first payout for first position and a second payout for the second position for the spin of the roulette wheel, wherein the first payout is higher than the second payout;	The game determines payouts for multiple positions on the roulette wheel. For example, the image below shows that 2 has a 200x payout; 3, 5, and 20 have a 100x payout; 14 has a 50x payout, and all other numbers have a 30x payout.  EX2027, 4. As another example, the image below shows that 16 and 22 have a 100x payout; 30 has a 500x payout, and all other numbers have a 30x payout.
1[i] determine that the ball has fallen in the first position for the spin of the roulette wheel; and	Lightning Roulette determines which position the ball landed on, and can determine whether that position was selected as a Lucky Number.

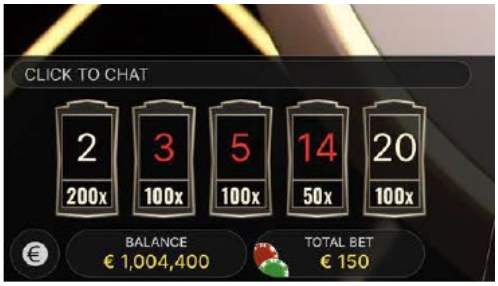

10 5 24
YOU WIN
€ 450
5 RED
1-18
EVEN
ODD
19-36

EX2027, 4.

11 30 8
YOU WIN
€ 2,500
30 RED

11 30 8
YOU WIN
€ 1,031
30 RED

1[j] indicating that the first player is to be paid at the first payout for the spin of the roulette wheel.	See 1[i], above
4. The system of claim 1, further comprising a display adjacent to the roulette wheel that indicates the first selected position.	A display for presenting the Lucky Numbers to players is adjacent to the roulette wheel, as shown below. 
5. The system of claim 4, wherein the hardware processor is further configured to cause a lightning visual effect to be presented when in connection with indicating the first selected position.	"In every game round, ***between one and five Lucky Numbers are generated*** at random and ***struck by lightning***." EX2027, 2. Lightning can be seen in the image below. 
7[pre] The system of claim 1, wherein the hardware processor is further configured to:	See claim 1[c], above.

7[a] randomly select a second selected position on the roulette wheel; and	"In every game round, ***between one and five Lucky Numbers are generated at random*** and struck by lightning. At the same time, each of the generated Lucky Numbers has a random multiplier applied to it: 50x, 100x, 200x, 300x, 400x or 500x. Naturally, this creates considerable extra suspense and excitement as each round spins by." EX2027, 2.
7[b] determine a payout for the second selected position that is different than the payout for the first position.	The game determines payouts for multiple positions on the roulette wheel. For example, the image below shows that 2 has a 200x payout; 3, 5, and 20 have a 100x payout; 14 has a 50x payout, and all other numbers have a 30x payout.  EX2027, 4. As another example, the image below shows that 16 and 22 have a 100x payout; 30 has a 500x payout, and all other numbers have a 30x payout.

I, Michael Casey, do hereby declare and state, that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, under Section 1001 of Title 18 of the United States Code.

Michael P. Casey

Executed on: March 11, 2026

Exhibit List

The list of exhibits that I considered when forming my opinions is below.

Exhibit	Reference Name
2001	2024 Evolution Annual Report
2002	2021 Evolution Annual Report
2003	Evolution Interim Report, January to June 2025
2004	Evolution Press Release: Five wins for Evolution Group at EGR B2B Awards including Live Casino Supplier of the Year for 12th year running (July 8, 2021) https://www.evolution.com/news/five-wins-for-evolution-group-at-egr-b2b-awards-including-live-casino-supplier-of-the-year-for-12th-year-running/
2005	Evolution's Lightning Roulette Voted GOTY At EGR (Oct. 30, 1018) https://lcb.org/news/evolution-s-lightning-roulette-voted-goty-at-egr
2006	Global Gaming Awards, Vegas 2018 Winners https://www.globalgamingawards.com/vegas/2018/
2007	Global Gaming Awards Las Vegas 2018 winners revealed (Oct. 8, 2018) https://www.gamblinginsider.com/news/6039/global-gaming-awards-las-vegas-2018-winners-revealed
2008	Evolution Press Release: Evolution and Scientific Games strike land-based Lightning Roulette deal (May 25, 2021) https://www.evolution.com/news/evolution-and-scientific-games-strike-land-based-lightning-roulette-deal/
2009	2022 American Gambling Awards Nominations https://www.gambling.com/us/awards/winners/2022
2010	Lightning Roulette U.S. from Evolution is the American Gambling Awards Gaming Product of the Year (Nov. 18, 2022) https://www.businesswire.com/news/home/20221118005067/en/Lightning-Roulette-U.S.-from-Evolution-is-the-American-Gambling-Awards-Gaming-Product-of-the-Year
2011	Lightning Roulette Product Page https://games.evolution.com/live-casino/live-roulette/lightning-roulette/
2012	Press Release re: FanDuel Extension (Nov. 14, 2024)

Exhibit	Reference Name
2013	L&W's Responses and Objections to Evolution's First Set of Interrogatories (Oct. 7, 2024) (excerpts)
2014	March 29, 2021 License Agreement between Evolution and L&W
2015	Evolution's February 28, 2022 Letter to L&W
2016	L&W's March 17, 2022 Letter to Evolution
2017	Dkt. No. 125, Second Amended Complaint in Evolution Malta Limited v. Light & Wonder, Inc., Case No. 2:24-cv-00993-CDS-EJK (D. Nev.)
2018	L&W's Invalidity Contentions (Nov. 2024)
2019	L&W's Supplemental Invalidity Contentions (Aug. 2025)
2020	Dkt. No. 67, Order Denying Motion to Stay Discovery (Nov. 7, 2024)
2021	Dkt. No. 84, Minutes of Proceedings
2022	Dkt. No. 122, Order Denying Joint Stipulation to Stay Discovery (June 25, 2025)
2023	Dkt. No. 151, Order Denying Stipulation to Extend Discovery (July 28, 2025)
2024	Dkt. No. 156, Defendants' Motion to Dismiss Plaintiffs' Second Amended Complaint (Aug. 9, 2025)
2025	Dkt. No. 157, Order Granting Joint Stipulation to Stay Discovery (Aug. 11, 2025)
2026	L&W's July 22, 2025 Letter to Evolution
2027	Lightning Roulette Fact Sheet (June 2020)
2028	C. Barboianu, Roulette Odds and Profits: The Mathematics of Complex Bets (2007) (excerpt)
2029	S. Bourie, Understanding Roulette Odds and Payouts, American Casino Guide Book https://www.americancasinoguidebook.com/roulette/understanding-roulette-odds-and-payouts.html
2030	L. Hoofe, Roulette Odds and Payouts, Gambling Zone https://www.gamblingzone.com/uk/roulette/odds/
2031	Bets, Odds, and Payouts: A list of all the bets on the roulette table, RouletteStar*

Exhibit	Reference Name
	https://www.roulettestar.com/guide/bets-odds/
2032	A guide to understanding roulette odds, Casino.org https://www.casino.org/roulette/odds/
2033	G. Pelayes, Roulette Table Payout: Maximizing Your Potential Wins, Vegas Aces (Aug. 1, 2024) https://www.vegas-aces.com/articles/roulette-table-payout-maximize-wins/
2034	NJ Regulations N.J. Admin. Code § 13:69F-5.2 – Roulette: payout odds
2035	L&W's Responses and Objections to Evolution's First Set of Interrogatories (Oct. 25, 2024) (excerpts)
2036	Lightning Roulette Game on Evolution's Website https://www.evolution.com/games/lightning-roulette/
2037	Evolution Gaming Wins Product Innovation of the Year at G2E, Real Money Action (Oct. 12, 2018)
2038	The 2018 Global Gaming Awards Las Vegas Categories https://stargambling.net/news/global-gaming-awards-2018-vegas.html
2039	Evolution and Scientific Games Strike Land-based Lightning Roulette Deal, PR NEWSWIRE (May 27, 2021), https://www.prnewswire.com/news-releases/evolution-and-scientific-games-strike-land-based-lightning-roulette-deal-301300565.html
2040	Plaintiffs' Motion for Reconsideration of Order Compelling Arbitration (ECF 163), No. 2:24-cv-00993 (D. Nev. Oct. 10, 2025), ECF 164
2044	D. Lubin, *The Essentials of Casino Game Design* (2016)
2045	Friedman Dep. Tr.
1001	U.S. Patent No. 11,011,014 (the "'014 Patent")
1002	File History for U.S. Patent No. 11,011,014
1003	Declaration of Stacy Friedman
1004	Curriculum Vitae of Stacy Friedman
1005	U.S. Patent No. 10,629,024 (the "'024 Patent")

Exhibit	Reference Name
1006	File History of U.S. Patent No. 10,629,024
1007	U.S. Pre-Grant Pub'l. No. 2008/0248853 (published Oct. 9, 2008) to Kido ("Kido")
1008	U.S. Pre-Grant Pub'l. No. 2016/0155296 (published June 2, 2016) to Baron ("Baron")
1009	U.S. Patent No. 9,600,974 to Yee ("Yee")
1010	Evolution's LPR 1-10 Response to Defendants' November 12, 2024 Invalidity and Unenforceability Contentions, Evolution Malta Ltd. v. Light & Wonder, Inc., No. 2:24-cv-00993 (D. Nev. Dec. 3, 2024)
1011	U.S. Patent No. 11,756,371 (the "'371 Patent")
1012	Partial File History of U.S. Patent No. 11,756,371
1013	Determine, THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2012)
1014	Roulette, WIKIPEDIA, https://en.wikipedia.org/wiki/Roulette
1015	Complaint (D. Nev. No. 2:24-cv-00993, May 8, 2024, Dkt. 2-1)
1016	U.S. Patent No. 7,674,172 to Miltenberger ("Miltenberger")
1017	U.S. Patent No. 9,646,459 to Hsu ("Hsu")
1018	U.S. Pre-Grant Pub'l. No. 2002/0167126 (published Nov. 14, 2002) to Raedt ("Raedt")
1019	U.S. Patent No. 5,540,442 to Orselli ("Orselli")
1020	Chart Comparing Independent Claims 1, 9, and 17 of the '014 Patent
1021	Chart Comparing Dependent Claims of the '014 Patent
1022	Order Granting Defendants' Motion to Dismiss (D. Nev. No. 2:24-cv-00993, Feb. 11, 2025, Dkt. 76)
1023	First Amended Complaint (D. Nev. No. 2:24-cv-00993, Apr. 10, 2025, Dkt. 85)
1024	Chart Comparing Independent Claims 1, 8, and 15 of the '024 Patent
1025	Chart Comparing Dependent Claims of the '024 Patent

Exhibit	Reference Name
1026	U.S. Pre-Grant Pub'l. No. 2011/0006477 (published Jan. 13, 2011) to Miller ("Miller")
1027	WO 2015/139088 A1 to Witty ("Witty")
1028	U.S. Pre-Grant Pub'l. No. 2008/0242393 (published Oct. 2, 2008) to Kido ("Kido 393")
1029	U.S. Pre-Grant Pub'l. No. 2007/0060262 (published Mar. 15, 2007) to Kosaka ("Kosaka")
1030	Chart Comparing Independent Claims 1, 11, and 21 of the '371 Patent
1031	Chart Comparing Dependent Claims of the '371 Patent
1032	John Scarne, SCARNE'S NEW COMPLETE GUIDE TO GAMBLING (1st Fireside ed. 1986)
1033	Roulette, CAESARS (1996), https://web.archive.org/web/19961031041803fw_/http://www.caesars.com/GamingGuide/Roulette.Content.html
1034	Roulette, MICROGAMING SYS. (1999), https://web.archive.org/web/19990503024445/http://www.microgaming.com:80/html/roulette.html
1035	Richard Marosi, Casino Boss Can't Cash In on Game He Developed, L.A. TIMES (Nov. 3, 2002)
1036	Andrew W. Scott, Baccarat Without the Juice, GAMING (Jan./Feb. 2013)
1037	Rakesh Wadhwa, NO-COMM'N BACCARAT (2d ed. 2006)
1038	U.S. Patent No. 4,836,553 to Suttle ("Suttle")
1039	U.S. Patent No. 5,288,081 to Breeding ("Breeding")
1040	U.S. Patent No. 5,685,774 to Webb ("Webb")
1041	Letter from Keith Cooper, State of Nevada Gaming Control Board to John Piccoli, D.P. Stud, Incorporated, approving the operation of "E Z Baccarat" (Dec. 24, 2003)
1042	U.S. Patent No. 7,435,172 to Hall ("Hall")
1043	Ultimate Texas Hold 'Em, U.S. Trademark Application Serial No. 77/726,392 (filed May 24, 2010)

Exhibit	Reference Name
1044	Benjamin Spillman, Global Gaming Expo 2006: Take My Game, Please, LAS VEGAS REV. J. (Nov. 20, 2006)
1045	Richard N. Velotta, Seeking a Place at the Gaming Table, LAS VEGAS SUN (May 12, 2009)
1046	Roulette, WIZARD OF ODDS (2016) https://web.archive.org/web/20161119154345/http:/lwizardofodds.com:80/games/roulette/basics/ (describes Roulette win probabilities)
1047	Top Hat™ Twenty-One, ROBERTWINTER.COM (May 29, 2006) https://web.archive.org/web/20060529010957/https://www.robertwinter.com/slot/odyssey/images/flyers/th_f.jpg
1048	Rapid Roulette, SHUFFLE MASTER INC. (May 7, 2005)
1049	Winning Games, WAGERWORKS (Mar. 10, 2007)
1050	Putting It All on the Table, DIGIDEAL (n.d.)
1051	This Month in Physics History, July 1654: Pascal's Letters to Fermat on the 'Problem of Points,' APS125 (July 2009), https://www.aps.org/archives/publications/apsnews/200907/physicshistory.cfm
1052	Wheel Poker, WIZARD OF ODDS (Apr. 21, 2010), https://web.archive.org/web/20120201095611/https://wizardofodds.com/games/video-poker/tables/wheel-poker/
1053	Bonus Spin, AGS (2016), https://web.archive.org/web/20170227055308/http://www.playags.com/portfolio/bonus-spin
1054	U.S. Patent No. 7,901,285 to Tran ("Tran")
1055	U.S. Patent No. 6,659,866 to Frost ("Frost")
1056	U.S. Pre-Grant Pub'l. No. 2014/0094244 (published Apr. 3, 2014) to Baron ("Baron and Haushalter")
1057	U.S. Patent No. 6,457,715 to Friedman ("Friedman '715")
1058	U.S. Patent No. 7,651,096 to Friedman ("Friedman '096")
1059	U.S. Patent No. 8,074,992 to Friedman ("Friedman '992")
1060	Sic Bo, WIZARD OF ODDS (Jan. 21, 2005),

Exhibit	Reference Name
	https://web.archive.org/web/20111007213531/http:/wizardofodds.com/sicbo/rules.html
1061	Spectacular, THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2012)
1062	Defendants' Motion to Dismiss Original Complaint (D. Nev. No. 2:24-cv-00993, July 24, 2024, Dkt. 34)
1063	Evolution's Motion for Leave to File Second Amended Complaint (D. Nev. No. 2:24-cv-00993, Apr. 10, 2025, Dkt. 90)
1064	Defendants' Motion to Dismiss First Amended Complaint (D. Nev. No. 2:24-cv-00993, May 15, 2025, Dkt. 114)
1065	Joint Stipulation to Extend Fact Discovery Cut Off Deadline Only (D. Nev. No. 2:24-cv-00993, July 25, 2025, Dkt. 150)
1066	U.S. District Courts, Federal Court Management Statistics (June 30, 2025)
1067	Defendants' Motion to Compel Arbitration (D. Nev. No. 2:24-cv-00993, Feb. 7, 2025, Dkt. 74)
1068	Order Resolving Defendants' Motions [Granting Motion to Compel Arbitration of Trade Secret Claims] (D. Nev. No. 2:24-cv-00993, Sep. 30, 2025, Dkt. 163)
	IPR2025-01073, Institution Decision, Paper 14 (Dec. 16, 2025)

Michael Casey, Ph.D.

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Director / Mathematician / Game Designer

Ph.D. Mathematician with a history of innovation, creating analytical approaches to difficult new problems. Hired, trained and managed mathematicians in the U.S. and India to create a broad variety of gaming products. Has personally created computer models using C++/C# for hundreds of games and used theoretical understandings to create useful algorithms and other tools for performing exact probabilistic calculations or insightful theories. Expert in Excel, familiar with many other Microsoft products with a history of quickly picking up new software packages as needed. Published author of scientific articles and author of dozens of gaming related patents.

Work Experience

Aristocrat, Reno, NV **2018 – 2020**

Director of Game Math & Design. Continued to lead, manage and hire for the math team in Reno, NV, and hired several mathematicians in India. Authored or coauthored more than a dozen game design and class II process patents as the primary architect for extending class II math and engineering processes to accommodate advances in game design that were not covered by initial algorithms. Worked with Tulalip casino, GLI testing agency, and Washington State regulators to derive a compliant and convenient product for CDS. Worked with engineering teams to create a system for implementing CDS math, including a complete format for providing mathematical data for each game over a variety of configurations. Created the software to process class II data to create CDS math and product parameters and formats for engineering teams, regulatory bodies, Aristocrat sales, and customers. Similarly researched requirements for historical horse racing and derived a compliant approach. Had an excellent employee retention rate, with only 1 person leaving, of the 10 hired, during my time at Aristocrat.

VGT/Aristocrat, Reno, NV **2015 – 2018**

Game Designer III. Assumed sole responsibility for maintaining and tweaking all legacy VGT class II math until I hired and trained statisticians for those tasks. Designed several games, but my primary responsibility was to hire a math team and to extend and improve initial class III to class II conversion algorithms to create a process that could be handed off to newly hired mathematicians. This was accomplished and hundreds of new and previously existing Aristocrat titles were converted and became successful in class II markets.

Multimedia Games (MGAM) and Everi, TX **2011 – 2015**

Game Design Mathematician. Game design, mathematical balance, simulation and statistical analysis of gameplay for over 80 titles, including many of the company's most successful products. Wrote a fully object oriented, multi-threaded, data driven slot simulator from scratch for gathering gameplay statistics from Monte Carlo simulations for a wide variety of slot products. This included the creation of advanced algorithms for automating elements of math design, including reel strip generation, exact payout calculation, and combining raw gameplay data into useful statistics that gave insight into gameplay experience for producers and other non-technical members of the team. Worked with the existing class 2 to class 3 bingo based slot system to convert several games, and created a modular Excel/C# interface for other math designers to efficiently re-use code and design in games that share similar features.

Global Gaming Group (G3), NV **2009 – 2010**

Lead Mathematician. Provided a wide variety of mathematical support for G3. This included incorporating player and customer feedback for dozens of Class 3 slot models and adapting many of those models for other purposes and markets. In addition to maintaining and improving Excel spreadsheets for all math models, maintained, updated and wrote C++ simulations for all games to study gameplay statistics. While 5 reel and 3 reel slots were the majority of the work, poker, keno, roulette and bingo games were also completed. Developed a method for converting Class 3 games to sweepstakes products with a reduced number of pay levels and reel results encoded and categorized as display. As Lead Mathematician, provided testing, evaluation and training for other G3 mathematicians.

Electronic Arts, CA **2006 – 2009**

Intermittent contract work for the Pogo division of EA. Modeling slot machine and other games of chance using Visual C++ to calculate expected returns and provide game balance. Providing Excel spreadsheets that are designed to allow significant future tweaks to the game while maintaining the integrity of the proof/calculation.

WMS Gaming Inc., IL **1999 - 2005**

Principal Mathematician. WMS Gaming's first mathematician. Defined the role in that company in addition to creating the processes that allowed other mathematicians to efficiently and reliably execute their responsibilities. Helped design and provided all math for dozens of successful titles, including: Men in Black, several games in the Monopoly series, Robin Hood, and Life of Luxury II. Sole author of a proof method and software to calculate optimal strategy and expected payout for novel poker games. Conceived of and programmed a project for writing a general slot game simulation code that was used to verify abstract slot and bonus game calculations. Co-authored software to provide automatically generated code to programmers that reflected mathematical aspects of each game. Wrote all simulation code using Microsoft Visual C++. All final calculations were provided in Excel, and game presentations were created in PowerPoint, both of which were learned for this job. Promoted to Senior Mathematician in October 2000 and Principal Mathematician in January of 2005. Evaluated potential mathematician applicants and trained all hired mathematicians.

r.evolution design and animation inc., Las Vegas, NV **1998-1999**

Graphic designer. Used Adobe Photoshop 5.0, Adobe Illustrator 7.0, Corel Draw 8.0, 3D Studio MAX 2.5, Adobe After Effects 3.1 and Adobe Premiere 5.0 for assistance in the creation of all elements of advertisements for clients of r.evolution, including The Hard Rock Hotel, Las Vegas.

Rutgers University, Newark, NJ **1997-1998**

Assistant Instructor. Department of Psychology, Rutgers University. Research and teaching in the computational implications of abstract, analogical processing in recurrent neural networks and the mathematical foundations of cognitive science. For this research, I created novel recurrent neural network architectures and wrote practical versions of these networks to test their viability in learning abstractions. Also ran a study group of approximately ten students that met weekly to discuss topics in theoretical neuroscience and neural networks.

Brandeis University, Waltham, MA **1995-1997**

Postdoctoral Fellow. Center for Theoretical Neurobiology, Brandeis University Advisors: Professors Eve Marder and Laurence Abbott. Research included mathematical and computational modeling (through the creation of custom software) of self-regulating neural ganglia. This fellowship was further enriched by collaboration with Maja J. Mataric, Computer Science Department, Brandeis University, for study and research in groups of autonomous agents and the computational complexity of interactions that lead to the development of dominance hierarchies.

San Diego Supercomputer Center, La Jolla, CA **1994-1995**

Computer Operator. Responsible for backups and monitoring computing machinery, including a Cray and Intel supercomputers, SGI workstations and networks of PCs.

U.S. Army **1985-1987**

Nuclear Weapons Maintenance Specialist. Served as part of a team that was responsible for the inspection and maintenance of nuclear weapons. Earned an Army achievement badge for outstanding service during a technical inspection, and an overseas service ribbon for serving in Germany. Attended the U.S. Military Academy Preparatory School for six months during my enlistment. Honorably discharged.

Education

University of California, San Diego **1990-1995**

PhD Mathematics. Advisor: Fields Medalist, Michael H. Freedman. Thesis: The Dynamics of Discrete-Time Computation, with Application to Recurrent Neural Networks and Finite State Machine Extraction. Awarded both National Science Foundation and National Defense Science and Engineering Fellowships (both are extremely competitive nation-wide full scholarships for graduate studies).

University of California, San Diego **1987-1990**

B.A. Mathematics with a minor in Cognitive Science. Valedictorian of Third College, UCSD. Received numerous academic awards, including a Reagent's Scholarship, University of California's top scholarship recognizing academic excellence while graduating in only 3 years when the average student was taking 5 years.

Publications and Patents

Aristocrat: Authored or coauthored more than a dozen game design and class II process patents as the primary architect for extending class II math and engineering processes to accommodate advances in game design that were not covered by initial algorithms.

Multimedia Games: Several patents awarded and have several others submitted.

WMS Gaming: Many patents awarded for novel video slot machine game designs that I originated or helped to create and then proved to work.

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