

# US Patent & Trademark Office

## Patent Public Search | Text View

---

United States Patent	12387558
Kind Code	B2
Date of Patent	August 12, 2025
Inventor(s)	Nguyen; Binh T. et al.

---

### Configurable virtual gaming zone

---

#### Abstract

In one embodiment, zone-based gaming activity within a gaming establishment can be configured. The method can, for example, include: setting a location within the gaming establishment for the zone-based gaming activity, the location being at least one defined region within the gaming establishment; configuring a virtual gaming zone for the location within the gaming establishment for the zone-based gaming activity; identifying one or more gaming devices that are within the virtual gaming zone; and permitting the identified one or more gaming devices that are within the virtual gaming zone to participate in the zone-based gaming activity.

---

<b>Inventors:</b>	Nguyen; Binh T. (Reno, NV), Rilett; Darrell (Boulder, CO)
<b>Applicant:</b>	Aristocrat Technologies, Inc. (ATI) (Las Vegas, NV)
<b>Family ID:</b>	45096647
<b>Assignee:</b>	Aristocrat Technologies, Inc. (Las Vegas, NV)
<b>Appl. No.:</b>	18/629831
<b>Filed:</b>	April 08, 2024

#### Prior Publication Data

<b>Document Identifier</b>	<b>Publication Date</b>
US 20240257607 A1	Aug. 01, 2024

#### Related U.S. Application Data

continuation parent-doc US 17511532 20211026 US 11983989 child-doc US 18629831  
continuation parent-doc US 15427308 20170208 ABANDONED child-doc US 17511532  
continuation parent-doc US 13801271 20130313 US 9607474 20170328 child-doc US 15427308

---

## Publication Classification

**Int. Cl.:** A63F9/24 (20060101); G07F17/32 (20060101); G07F17/34 (20060101)

**U.S. Cl.:**

**CPC** G07F17/323 (20130101); G07F17/3209 (20130101); G07F17/3211 (20130101); G07F17/3218 (20130101); G07F17/3223 (20130101); G07F17/3225 (20130101); G07F17/3227 (20130101); G07F17/3241 (20130101); G07F17/326 (20130101); G07F17/3272 (20130101); G07F17/3206 (20130101); G07F17/3232 (20130101); G07F17/3255 (20130101); G07F17/34 (20130101)

## Field of Classification Search

**USPC:** None

---

## References Cited

### U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
2033638	12/1935	Koppl	N/A	N/A
2062923	12/1935	Nagy	N/A	N/A
4741539	12/1987	Sutton	N/A	N/A
4948138	12/1989	Pease	N/A	N/A
4969183	12/1989	Reese	N/A	N/A
5067712	12/1990	Georgilas	N/A	N/A
5275400	12/1993	Weingardt	N/A	N/A
5429361	12/1994	Raven	N/A	N/A
5489103	12/1995	Okamoto	N/A	N/A
5618232	12/1996	Martin	N/A	N/A
5630757	12/1996	Gagin	N/A	N/A
5655961	12/1996	Acres	N/A	N/A
5704835	12/1997	Dietz, II	N/A	N/A
5727786	12/1997	Weingardt	N/A	N/A
5833537	12/1997	Barrie	N/A	N/A
5842921	12/1997	Mindes	N/A	N/A
5919091	12/1998	Bell	N/A	N/A
5947820	12/1998	Morro	N/A	N/A
5997401	12/1998	Crawford	N/A	N/A
6001016	12/1998	Walker	N/A	N/A
6039648	12/1999	Guinn	N/A	N/A
6059289	12/1999	Vancura	N/A	N/A
6089977	12/1999	Bennett	N/A	N/A
6095920	12/1999	Sadahiro	N/A	N/A
6110041	12/1999	Walker	N/A	N/A
6142872	12/1999	Walker	N/A	N/A
6146271	12/1999	Kadlic	N/A	N/A
6146273	12/1999	Olsen	N/A	N/A
6165071	12/1999	Weiss	N/A	N/A

6231445	12/2000	Acres	N/A	N/A
6244958	12/2000	Acres	N/A	N/A
6270412	12/2000	Crawford	N/A	N/A
6290600	12/2000	Glasson	N/A	N/A
6293866	12/2000	Walker	N/A	N/A
6353390	12/2001	Beri	N/A	N/A
6364768	12/2001	Acres	N/A	N/A
6404884	12/2001	Marwell	N/A	N/A
6416406	12/2001	Duhamel	N/A	N/A
6416409	12/2001	Jordan	N/A	N/A
6443452	12/2001	Brune	N/A	N/A
6491584	12/2001	Graham	N/A	N/A
6500067	12/2001	Luciano	N/A	N/A
6505095	12/2002	Kolls	N/A	N/A
6508710	12/2002	Paravia	N/A	N/A
6561900	12/2002	Baerlocher	N/A	N/A
6592457	12/2002	Frohm	N/A	N/A
6612574	12/2002	Cole	N/A	N/A
6620046	12/2002	Rowe	N/A	N/A
6641477	12/2002	Dietz, II	N/A	N/A
6645078	12/2002	Mattice	N/A	N/A
6675152	12/2003	Prasad	N/A	N/A
6699128	12/2003	Beadell	N/A	N/A
6719630	12/2003	Seelig	N/A	N/A
6749510	12/2003	Giobbi	N/A	N/A
6758757	12/2003	Luciano, Jr.	N/A	N/A
6773345	12/2003	Walker	N/A	N/A
6778820	12/2003	Tendler	N/A	N/A
6780111	12/2003	Cannon	N/A	N/A
6799032	12/2003	McDonnell	N/A	N/A
6800027	12/2003	Giobbi	N/A	N/A
6804763	12/2003	Stockdale	N/A	N/A
6811486	12/2003	Luciano, Jr.	N/A	N/A
6843725	12/2004	Nelson	N/A	N/A
6846238	12/2004	Wells	N/A	N/A
6848995	12/2004	Walker	N/A	N/A
6852029	12/2004	Baltz	N/A	N/A
6869361	12/2004	Sharpless	N/A	N/A
6875106	12/2004	Weiss	N/A	N/A
6884170	12/2004	Rowe	N/A	N/A
6884172	12/2004	Lloyd	N/A	N/A
6902484	12/2004	Idaka	N/A	N/A
6908390	12/2004	Nguyen	N/A	N/A
6913532	12/2004	Baerlocher	N/A	N/A
6923721	12/2004	Luciano	N/A	N/A
6935958	12/2004	Nelson	N/A	N/A
6949022	12/2004	Showers	N/A	N/A
6955600	12/2004	Glavich	N/A	N/A
6971956	12/2004	Rowe	N/A	N/A
6984174	12/2005	Cannon	N/A	N/A

6997803	12/2005	Lemay	N/A	N/A
7018292	12/2005	Tracy	N/A	N/A
7032115	12/2005	Kashani	N/A	N/A
7033276	12/2005	Walker	N/A	N/A
7035626	12/2005	Luciano, Jr.	N/A	N/A
7037195	12/2005	Schneider	N/A	N/A
7048628	12/2005	Schneider	N/A	N/A
7048630	12/2005	Berg	N/A	N/A
7063617	12/2005	Brosnan	N/A	N/A
7076329	12/2005	Kolls	N/A	N/A
7089264	12/2005	Guido	N/A	N/A
7094148	12/2005	Baerlocher	N/A	N/A
7105736	12/2005	Laakso	N/A	N/A
7111141	12/2005	Nelson	N/A	N/A
7144321	12/2005	Mayeroff	N/A	N/A
7152783	12/2005	Charrin	N/A	N/A
7169041	12/2006	Tessmer	N/A	N/A
7169052	12/2006	Beaulieu	N/A	N/A
7175523	12/2006	Gilmore	N/A	N/A
7181228	12/2006	Boesch	N/A	N/A
7182690	12/2006	Giobbi	N/A	N/A
7198571	12/2006	Lemay	N/A	N/A
RE39644	12/2006	Alcorn	N/A	N/A
7217191	12/2006	Cordell	N/A	N/A
7243104	12/2006	Bill	N/A	N/A
7247098	12/2006	Bradford	N/A	N/A
7259718	12/2006	Patterson	N/A	N/A
7275989	12/2006	Moody	N/A	N/A
7285047	12/2006	Gelb	N/A	N/A
7311608	12/2006	Danieli	N/A	N/A
7314408	12/2007	Cannon	N/A	N/A
7316615	12/2007	Soltys	N/A	N/A
7316619	12/2007	Nelson	N/A	N/A
7318775	12/2007	Brosnan	N/A	N/A
7326116	12/2007	O'Donovan	N/A	N/A
7330108	12/2007	Thomas	N/A	N/A
7346358	12/2007	Wood	N/A	N/A
7355112	12/2007	Laakso	N/A	N/A
7384338	12/2007	Rothschild	N/A	N/A
7387571	12/2007	Walker	N/A	N/A
7393278	12/2007	Gerson	N/A	N/A
7396990	12/2007	Lu	N/A	N/A
7415426	12/2007	Williams	N/A	N/A
7425177	12/2007	Rodgers	N/A	N/A
7427234	12/2007	Soltys	N/A	N/A
7427236	12/2007	Kaminkow	N/A	N/A
7427708	12/2007	Ohmura	N/A	N/A
7431650	12/2007	Kessman	N/A	N/A
7448949	12/2007	Kaminkow	N/A	N/A
7500913	12/2008	Baerlocher	N/A	N/A

7510474	12/2008	Carter, Sr.	N/A	N/A
7513828	12/2008	Nguyen	N/A	N/A
7519838	12/2008	Suurballe	N/A	N/A
7559838	12/2008	Walker	N/A	N/A
7563167	12/2008	Walker	N/A	N/A
7572183	12/2008	Olivas	N/A	N/A
7585222	12/2008	Muir	N/A	N/A
7602298	12/2008	Thomas	N/A	N/A
7607174	12/2008	Kashchenko	N/A	N/A
7611409	12/2008	Muir	N/A	N/A
7637810	12/2008	Amaitis	N/A	N/A
7644861	12/2009	Alderucci	N/A	N/A
7653757	12/2009	Fernald	N/A	N/A
7693306	12/2009	Huber	N/A	N/A
7699703	12/2009	Muir	N/A	N/A
7722453	12/2009	Lark	N/A	N/A
7742996	12/2009	Kwan	N/A	N/A
7758423	12/2009	Foster	N/A	N/A
7771271	12/2009	Walker	N/A	N/A
7780529	12/2009	Rowe	N/A	N/A
7780531	12/2009	Englman	N/A	N/A
7785192	12/2009	Canterbury	N/A	N/A
7811172	12/2009	Asher	N/A	N/A
7819749	12/2009	Fish	N/A	N/A
7822688	12/2009	Labrou	N/A	N/A
7828652	12/2009	Nguyen	N/A	N/A
7828654	12/2009	Carter, Sr.	N/A	N/A
7828661	12/2009	Fish	N/A	N/A
7850528	12/2009	Wells	N/A	N/A
7874919	12/2010	Paulsen	N/A	N/A
7877798	12/2010	Saunders	N/A	N/A
7883413	12/2010	Paulsen	N/A	N/A
7892097	12/2010	Muir	N/A	N/A
7909692	12/2010	Nguyen	N/A	N/A
7909699	12/2010	Parrott	N/A	N/A
7918728	12/2010	Nguyen	N/A	N/A
7927211	12/2010	Rowe	N/A	N/A
7927212	12/2010	Hedrick	N/A	N/A
7951008	12/2010	Wolf	N/A	N/A
8057298	12/2010	Nguyen	N/A	N/A
8057303	12/2010	Rasmussen	N/A	N/A
8087988	12/2011	Nguyen	N/A	N/A
8117608	12/2011	Slettehaugh	N/A	N/A
8133113	12/2011	Nguyen	N/A	N/A
8182326	12/2011	Speer, II	N/A	N/A
8210927	12/2011	Hedrick	N/A	N/A
8221245	12/2011	Walker	N/A	N/A
8226459	12/2011	Barrett	N/A	N/A
8226474	12/2011	Nguyen	N/A	N/A
8231456	12/2011	Zielinski	N/A	N/A

8235803	12/2011	Loose	N/A	N/A
8276010	12/2011	Vavilala	N/A	N/A
8282475	12/2011	Nguyen	N/A	N/A
8323099	12/2011	Durham	N/A	N/A
8337290	12/2011	Nguyen	N/A	N/A
8342946	12/2012	Amaitis	N/A	N/A
8393948	12/2012	Allen	N/A	N/A
8403758	12/2012	Hornik	N/A	N/A
8430745	12/2012	Agarwal	N/A	N/A
8461958	12/2012	Saenz	N/A	N/A
8465368	12/2012	Hardy	N/A	N/A
8469813	12/2012	Joshi	N/A	N/A
8529345	12/2012	Nguyen	N/A	N/A
8597108	12/2012	Nguyen	N/A	N/A
8602875	12/2012	Nguyen	N/A	N/A
8613655	12/2012	Kisenwether	N/A	N/A
8613659	12/2012	Nelson	N/A	N/A
8622823	12/2013	Huynh	N/A	N/A
8678901	12/2013	Kelly	N/A	N/A
8696470	12/2013	Nguyen	N/A	N/A
8745417	12/2013	Huang	N/A	N/A
8821255	12/2013	Friedman	N/A	N/A
8834254	12/2013	Buchholz	N/A	N/A
8858323	12/2013	Nguyen	N/A	N/A
8864586	12/2013	Nguyen	N/A	N/A
8942995	12/2014	Kerr	N/A	N/A
9039507	12/2014	Allen	N/A	N/A
9235952	12/2015	Nguyen	N/A	N/A
9292996	12/2015	Davis	N/A	N/A
9325203	12/2015	Nguyen	N/A	N/A
9466171	12/2015	Hornik	N/A	N/A
9483901	12/2015	Nguyen	N/A	N/A
9486697	12/2015	Nguyen	N/A	N/A
9486704	12/2015	Nguyen	N/A	N/A
9530277	12/2015	Nelson	N/A	N/A
9576425	12/2016	Nguyen	N/A	N/A
9626826	12/2016	Nguyen	N/A	N/A
9666015	12/2016	Acres	N/A	N/A
9666021	12/2016	Nguyen	N/A	N/A
9672686	12/2016	Nguyen	N/A	N/A
9741205	12/2016	Nguyen	N/A	N/A
9811973	12/2016	Nguyen	N/A	N/A
9814970	12/2016	Nguyen	N/A	N/A
9842462	12/2016	Nguyen	N/A	N/A
9875606	12/2017	Nguyen	N/A	N/A
9875609	12/2017	Nguyen	N/A	N/A
9981180	12/2017	Koyanagi	N/A	N/A
10068429	12/2017	Gagner	N/A	N/A
10115270	12/2017	Gagner	N/A	N/A
10140816	12/2017	Nguyen	N/A	N/A

10325447	12/2018	Malek	N/A	N/A
10421010	12/2018	Nguyen	N/A	N/A
10438446	12/2018	Nguyen	N/A	N/A
10445978	12/2018	Nguyen	N/A	N/A
10796679	12/2019	Powell	N/A	N/A
10818133	12/2019	Nguyen	N/A	N/A
2001/0004607	12/2000	Olsen	N/A	N/A
2001/0016516	12/2000	Takatsuka	N/A	N/A
2001/0024971	12/2000	Brossard	N/A	N/A
2001/0025272	12/2000	Mori	N/A	N/A
2001/0031659	12/2000	Perrie	N/A	N/A
2001/0047291	12/2000	Garahi	N/A	N/A
2002/0006822	12/2001	Krintzman	N/A	N/A
2002/0042295	12/2001	Walker	N/A	N/A
2002/0043759	12/2001	Vancura	N/A	N/A
2002/0045474	12/2001	Singer	N/A	N/A
2002/0107065	12/2001	Rowe	N/A	N/A
2002/0107799	12/2001	Hoshino	N/A	N/A
2002/0111210	12/2001	Luciano	N/A	N/A
2002/0111213	12/2001	McEntee	N/A	N/A
2002/0113369	12/2001	Weingardt	N/A	N/A
2002/0116615	12/2001	Nguyen	N/A	N/A
2002/0133418	12/2001	Hammond	N/A	N/A
2002/0137217	12/2001	Rowe	N/A	N/A
2002/0142825	12/2001	Lark	N/A	N/A
2002/0145051	12/2001	Charrin	N/A	N/A
2002/0147047	12/2001	Letovsky	N/A	N/A
2002/0147049	12/2001	Carter	N/A	N/A
2002/0151366	12/2001	Walker	N/A	N/A
2002/0152120	12/2001	Howington	N/A	N/A
2002/0167536	12/2001	Valdes	N/A	N/A
2002/0177483	12/2001	Cannon	N/A	N/A
2002/0183105	12/2001	Cannon	N/A	N/A
2003/0001338	12/2002	Bennett	N/A	N/A
2003/0003996	12/2002	Nguyen	N/A	N/A
2003/0004871	12/2002	Rowe	N/A	N/A
2003/0008696	12/2002	Abecassis	N/A	N/A
2003/0013531	12/2002	Rowe	N/A	N/A
2003/0027635	12/2002	Walker	N/A	N/A
2003/0064805	12/2002	Wells	N/A	N/A
2003/0064807	12/2002	Walker	N/A	N/A
2003/0078094	12/2002	Gatto	N/A	N/A
2003/0092480	12/2002	White	N/A	N/A
2003/0100361	12/2002	Sharpless	N/A	N/A
2003/0104860	12/2002	Cannon	N/A	N/A
2003/0104865	12/2002	Itkis	N/A	N/A
2003/0148809	12/2002	Nelson	N/A	N/A
2003/0148812	12/2002	Paulsen	N/A	N/A
2003/0162588	12/2002	Brosnan	N/A	N/A
2003/0195024	12/2002	Slattery	N/A	N/A

2003/0199295	12/2002	Vancura	N/A	N/A
2003/0224852	12/2002	Walker	N/A	N/A
2003/0224854	12/2002	Joao	N/A	N/A
2004/0002386	12/2003	Wolfe	N/A	N/A
2004/0005919	12/2003	Walker	N/A	N/A
2004/0015619	12/2003	Brown	N/A	N/A
2004/0023709	12/2003	Beaulieu	N/A	N/A
2004/0023716	12/2003	Gauselmann	N/A	N/A
2004/0038736	12/2003	Bryant	N/A	N/A
2004/0048650	12/2003	Mierau	N/A	N/A
2004/0068460	12/2003	Feeley	N/A	N/A
2004/0082384	12/2003	Walker	N/A	N/A
2004/0082385	12/2003	Silva	N/A	N/A
2004/0094624	12/2003	Fernandes	N/A	N/A
2004/0106449	12/2003	Walker	N/A	N/A
2004/0116115	12/2003	Ertel	N/A	N/A
2004/0127277	12/2003	Walker	N/A	N/A
2004/0127290	12/2003	Walker	N/A	N/A
2004/0137987	12/2003	Nguyen	N/A	N/A
2004/0142744	12/2003	Atkinson	N/A	N/A
2004/0147308	12/2003	Walker	N/A	N/A
2004/0152508	12/2003	Lind	N/A	N/A
2004/0199631	12/2003	Natsume	N/A	N/A
2004/0214622	12/2003	Atkinson	N/A	N/A
2004/0224753	12/2003	O'Donovan	N/A	N/A
2004/0229671	12/2003	Stronach	N/A	N/A
2004/0256803	12/2003	Ko	N/A	N/A
2004/0259633	12/2003	Gentles	N/A	N/A
2005/0003890	12/2004	Hedrick	N/A	N/A
2005/0004980	12/2004	Vadjinia	N/A	N/A
2005/0026696	12/2004	Hashimoto	N/A	N/A
2005/0033651	12/2004	Kogan	N/A	N/A
2005/0043996	12/2004	Silver	N/A	N/A
2005/0054446	12/2004	Kammler	N/A	N/A
2005/0101376	12/2004	Walker	N/A	N/A
2005/0101383	12/2004	Wells	N/A	N/A
2005/0125244	12/2004	Schneider	N/A	N/A
2005/0130728	12/2004	Nguyen	N/A	N/A
2005/0130731	12/2004	Englman	N/A	N/A
2005/0136949	12/2004	Barnes, Jr.	N/A	N/A
2005/0137014	12/2004	Vetelainen	N/A	N/A
2005/0143169	12/2004	Nguyen	N/A	N/A
2005/0167921	12/2004	Finocchio	N/A	N/A
2005/0170883	12/2004	Muskin	N/A	N/A
2005/0181865	12/2004	Luciano	N/A	N/A
2005/0181870	12/2004	Nguyen	N/A	N/A
2005/0181875	12/2004	Hoehne	N/A	N/A
2005/0187020	12/2004	Amaitis	N/A	N/A
2005/0202865	12/2004	Kim	N/A	N/A
2005/0202875	12/2004	Murphy	N/A	N/A



2005/0208993	12/2004	Yoshizawa	N/A	N/A
2005/0209002	12/2004	Blythe	N/A	N/A
2005/0221881	12/2004	Lannert	N/A	N/A
2005/0223219	12/2004	Gatto	N/A	N/A
2005/0239546	12/2004	Hedrick	N/A	N/A
2005/0255919	12/2004	Nelson	N/A	N/A
2005/0273635	12/2004	Wilcox	N/A	N/A
2005/0277471	12/2004	Russell	N/A	N/A
2005/0282637	12/2004	Gatto	N/A	N/A
2006/0009283	12/2005	Englman	N/A	N/A
2006/0035707	12/2005	Nguyen	N/A	N/A
2006/0036874	12/2005	Cockerille	N/A	N/A
2006/0046822	12/2005	Kaminkow	N/A	N/A
2006/0046830	12/2005	Webb	N/A	N/A
2006/0046849	12/2005	Kovacs	N/A	N/A
2006/0068893	12/2005	Jaffe	N/A	N/A
2006/0068897	12/2005	Sanford	N/A	N/A
2006/0073869	12/2005	Lemay	N/A	N/A
2006/0073888	12/2005	Nguyen	N/A	N/A
2006/0073897	12/2005	Englman	N/A	N/A
2006/0079317	12/2005	Flemming	N/A	N/A
2006/0121972	12/2005	Walker	N/A	N/A
2006/0126529	12/2005	Hardy	N/A	N/A
2006/0148551	12/2005	Walker	N/A	N/A
2006/0189382	12/2005	Muir	N/A	N/A
2006/0217170	12/2005	Roireau	N/A	N/A
2006/0217193	12/2005	Walker	N/A	N/A
2006/0247028	12/2005	Brosnan	N/A	N/A
2006/0247035	12/2005	Rowe	N/A	N/A
2006/0252530	12/2005	Oberberger	N/A	N/A
2006/0253481	12/2005	Guido	N/A	N/A
2006/0256135	12/2005	Aoyama	N/A	N/A
2006/0281525	12/2005	Borissov	N/A	N/A
2006/0281541	12/2005	Nguyen	N/A	N/A
2006/0287106	12/2005	Jensen	N/A	N/A
2007/0004510	12/2006	Underdahl	N/A	N/A
2007/0026935	12/2006	Wolf	N/A	N/A
2007/0026942	12/2006	Kinsley	N/A	N/A
2007/0054739	12/2006	Amaitis	N/A	N/A
2007/0060254	12/2006	Muir	N/A	N/A
2007/0060306	12/2006	Amaitis	N/A	N/A
2007/0060319	12/2006	Block	N/A	N/A
2007/0060358	12/2006	Amaitis	N/A	N/A
2007/0077981	12/2006	Hungate	N/A	N/A
2007/0087833	12/2006	Feeney	N/A	N/A
2007/0087834	12/2006	Moser	N/A	N/A
2007/0093299	12/2006	Bergeron	N/A	N/A
2007/0099697	12/2006	Nelson	463/29	G07F 17/3202
2007/0129123	12/2006	Eryou	N/A	N/A

2007/0129148	12/2006	Van Luchene	N/A	N/A
2007/0149279	12/2006	Norden	N/A	N/A
2007/0149286	12/2006	Bemmel	N/A	N/A
2007/0155465	12/2006	Walker	N/A	N/A
2007/0159301	12/2006	Hirt	N/A	N/A
2007/0161402	12/2006	Ng	N/A	N/A
2007/0184896	12/2006	Dickerson	N/A	N/A
2007/0184904	12/2006	Lee	N/A	N/A
2007/0191109	12/2006	Crowder	N/A	N/A
2007/0207852	12/2006	Nelson	N/A	N/A
2007/0207854	12/2006	Wolf	N/A	N/A
2007/0235521	12/2006	Mateen	N/A	N/A
2007/0238505	12/2006	Okada	N/A	N/A
2007/0241187	12/2006	Alderucci	N/A	N/A
2007/0248036	12/2006	Nevalainen	N/A	N/A
2007/0257430	12/2006	Hardy	N/A	N/A
2007/0259713	12/2006	Fiden	N/A	N/A
2007/0259716	12/2006	Mattice	N/A	N/A
2007/0259717	12/2006	Mattice	N/A	N/A
2007/0265984	12/2006	Santhana	N/A	N/A
2007/0270213	12/2006	Nguyen	N/A	N/A
2007/0275777	12/2006	Walker	N/A	N/A
2007/0275779	12/2006	Amaitis	N/A	N/A
2007/0281782	12/2006	Amaitis	N/A	N/A
2007/0281785	12/2006	Amaitis	N/A	N/A
2007/0298858	12/2006	Toneguzzo	N/A	N/A
2007/0298873	12/2006	Nguyen	N/A	N/A
2008/0015032	12/2007	Bradford	N/A	N/A
2008/0020824	12/2007	Cuddy	N/A	N/A
2008/0020845	12/2007	Low	N/A	N/A
2008/0032787	12/2007	Low	N/A	N/A
2008/0058105	12/2007	Combs	N/A	N/A
2008/0070652	12/2007	Nguyen	N/A	N/A
2008/0070681	12/2007	Marks	N/A	N/A
2008/0076505	12/2007	Nguyen	N/A	N/A
2008/0076506	12/2007	Nguyen	N/A	N/A
2008/0076548	12/2007	Paulsen	N/A	N/A
2008/0076572	12/2007	Nguyen	N/A	N/A
2008/0096650	12/2007	Baerlocher	N/A	N/A
2008/0102916	12/2007	Kovacs	N/A	N/A
2008/0102935	12/2007	Finnimore	N/A	N/A
2008/0102956	12/2007	Burman	N/A	N/A
2008/0102957	12/2007	Burman	N/A	N/A
2008/0108401	12/2007	Baerlocher	N/A	N/A
2008/0113772	12/2007	Burrill	N/A	N/A
2008/0119267	12/2007	Denlay	N/A	N/A
2008/0126529	12/2007	Kim	N/A	N/A
2008/0139274	12/2007	Baerlocher	N/A	N/A
2008/0139306	12/2007	Lutnick	N/A	N/A
2008/0146321	12/2007	Parente	N/A	N/A

2008/0146344	12/2007	Rowe	N/A	N/A
2008/0150902	12/2007	Edpalm	N/A	N/A
2008/0153583	12/2007	Huntley	N/A	N/A
2008/0161110	12/2007	Campbell	N/A	N/A
2008/0167106	12/2007	Lutnick	N/A	N/A
2008/0167118	12/2007	Kroeckel	N/A	N/A
2008/0167130	12/2007	Kroeckel	N/A	N/A
2008/0182667	12/2007	Davis	N/A	N/A
2008/0200251	12/2007	Alderucci	N/A	N/A
2008/0207307	12/2007	Cunningham Ii	N/A	N/A
2008/0214258	12/2007	Brosnan	N/A	N/A
2008/0214310	12/2007	Brunet De Courssou	N/A	N/A
2008/0215319	12/2007	Lu	N/A	N/A
2008/0234047	12/2007	Nguyen	N/A	N/A
2008/0238610	12/2007	Rosenberg	N/A	N/A
2008/0248849	12/2007	Lutnick	N/A	N/A
2008/0248865	12/2007	Tedesco	N/A	N/A
2008/0252419	12/2007	Batchelor	N/A	N/A
2008/0254878	12/2007	Saunders	N/A	N/A
2008/0254881	12/2007	Lutnick	N/A	N/A
2008/0254883	12/2007	Patel	N/A	N/A
2008/0254891	12/2007	Saunders	N/A	N/A
2008/0254892	12/2007	Saunders	N/A	N/A
2008/0254897	12/2007	Saunders	N/A	N/A
2008/0263173	12/2007	Weber	N/A	N/A
2008/0300058	12/2007	Sum	N/A	N/A
2008/0305864	12/2007	Kelly	N/A	N/A
2008/0305865	12/2007	Kelly	N/A	N/A
2008/0305866	12/2007	Kelly	N/A	N/A
2008/0311994	12/2007	Amaitis	N/A	N/A
2008/0318669	12/2007	Buchholz	N/A	N/A
2008/0318686	12/2007	Crowder	N/A	N/A
2009/0005165	12/2008	Arezina	N/A	N/A
2009/0011822	12/2008	Englman	N/A	N/A
2009/0017906	12/2008	Jackson	N/A	N/A
2009/0021381	12/2008	Kondo	N/A	N/A
2009/0029766	12/2008	Lutnick	N/A	N/A
2009/0054149	12/2008	Brosnan	N/A	N/A
2009/0061990	12/2008	Schwartz	N/A	N/A
2009/0069063	12/2008	Thomas	N/A	N/A
2009/0077396	12/2008	Tsai	N/A	N/A
2009/0088258	12/2008	Saunders	N/A	N/A
2009/0098925	12/2008	Gagner	N/A	N/A
2009/0104977	12/2008	Zielinski	N/A	N/A
2009/0104983	12/2008	Okada	N/A	N/A
2009/0118002	12/2008	Lyons	N/A	N/A
2009/0118013	12/2008	Finnimore	N/A	N/A
2009/0118022	12/2008	Lyons	N/A	N/A
2009/0124366	12/2008	Aoki	N/A	N/A

2009/0124390	12/2008	Seelig	N/A	N/A
2009/0131146	12/2008	Arezina	N/A	N/A
2009/0131151	12/2008	Harris	N/A	N/A
2009/0131155	12/2008	Hollibaugh	N/A	N/A
2009/0132163	12/2008	Ashley, Jr.	N/A	N/A
2009/0137255	12/2008	Ashley, Jr.	N/A	N/A
2009/0138133	12/2008	Buchholz	N/A	N/A
2009/0143141	12/2008	Wells	N/A	N/A
2009/0149245	12/2008	Fabbri	N/A	N/A
2009/0149261	12/2008	Chen	N/A	N/A
2009/0153342	12/2008	Thorn	N/A	N/A
2009/0156303	12/2008	Kiely	N/A	N/A
2009/0163272	12/2008	Baker	N/A	N/A
2009/0176578	12/2008	Herrmann	N/A	N/A
2009/0191962	12/2008	Hardy	N/A	N/A
2009/0197684	12/2008	Arezina	N/A	N/A
2009/0216547	12/2008	Canora	N/A	N/A
2009/0219901	12/2008	Bull	N/A	N/A
2009/0221342	12/2008	Katz	N/A	N/A
2009/0227302	12/2008	Abe	N/A	N/A
2009/0239666	12/2008	Hall	N/A	N/A
2009/0264190	12/2008	Davis	N/A	N/A
2009/0265105	12/2008	Davis	N/A	N/A
2009/0270166	12/2008	Thukral	N/A	N/A
2009/0270170	12/2008	Patton	N/A	N/A
2009/0271287	12/2008	Halpern	N/A	N/A
2009/0275402	12/2008	Backover	N/A	N/A
2009/0275410	12/2008	Kisenwether	N/A	N/A
2009/0275411	12/2008	Kisenwether	N/A	N/A
2009/0280910	12/2008	Gagner	N/A	N/A
2009/0282469	12/2008	Lynch	N/A	N/A
2009/0298468	12/2008	Hsu	N/A	N/A
2010/0002897	12/2009	Keady	N/A	N/A
2010/0004058	12/2009	Acres	N/A	N/A
2010/0016069	12/2009	Herrmann	N/A	N/A
2010/0049738	12/2009	Mathur	N/A	N/A
2010/0056248	12/2009	Acres	N/A	N/A
2010/0062833	12/2009	Mattice	N/A	N/A
2010/0062840	12/2009	Herrmann	N/A	N/A
2010/0069160	12/2009	Barrett	N/A	N/A
2010/0079237	12/2009	Falk	N/A	N/A
2010/0081501	12/2009	Carpenter	N/A	N/A
2010/0081509	12/2009	Burke	463/25	G07F 17/3227
2010/0099499	12/2009	Amaitis	N/A	N/A
2010/0105454	12/2009	Weber	N/A	N/A
2010/0106612	12/2009	Gupta	N/A	N/A
2010/0113161	12/2009	Walker	N/A	N/A
2010/0115591	12/2009	Kane-Esrig	N/A	N/A
2010/0120486	12/2009	Dewaal	N/A	N/A

2010/0124967	12/2009	Lutnick	N/A	N/A
2010/0130276	12/2009	Fiden	N/A	N/A
2010/0160035	12/2009	Herrmann	N/A	N/A
2010/0160043	12/2009	Fujimoto	N/A	N/A
2010/0178977	12/2009	Kim	N/A	N/A
2010/0184509	12/2009	Sylla	N/A	N/A
2010/0197383	12/2009	Rader	N/A	N/A
2010/0197385	12/2009	Aoki	N/A	N/A
2010/0203955	12/2009	Sylla	N/A	N/A
2010/0203957	12/2009	Enzminger	N/A	N/A
2010/0203963	12/2009	Allen	N/A	N/A
2010/0224681	12/2009	Triplett	N/A	N/A
2010/0227662	12/2009	Speer, II	N/A	N/A
2010/0227670	12/2009	Arezina	N/A	N/A
2010/0227671	12/2009	Laaroussi	N/A	N/A
2010/0227687	12/2009	Speer, II	N/A	N/A
2010/0234091	12/2009	Baerlocher	N/A	N/A
2010/0279764	12/2009	Allen	N/A	N/A
2010/0323780	12/2009	Acres	N/A	N/A
2010/0325703	12/2009	Etchegoyen	N/A	N/A
2011/0009181	12/2010	Speer, II	N/A	N/A
2011/0039615	12/2010	Acres	N/A	N/A
2011/0053679	12/2010	Canterbury	N/A	N/A
2011/0065492	12/2010	Acres	N/A	N/A
2011/0076941	12/2010	Taveau	N/A	N/A
2011/0086696	12/2010	Macewan	N/A	N/A
2011/0105216	12/2010	Cohen	N/A	N/A
2011/0111827	12/2010	Nicely	N/A	N/A
2011/0111843	12/2010	Nicely	N/A	N/A
2011/0111860	12/2010	Nguyen	N/A	N/A
2011/0118010	12/2010	Brune	N/A	N/A
2011/0159966	12/2010	Gura	N/A	N/A
2011/0183732	12/2010	Block	N/A	N/A
2011/0183749	12/2010	Allen	N/A	N/A
2011/0207525	12/2010	Allen	N/A	N/A
2011/0212711	12/2010	Scott	N/A	N/A
2011/0212767	12/2010	Barclay	N/A	N/A
2011/0223993	12/2010	Allen	N/A	N/A
2011/0244952	12/2010	Schueller	N/A	N/A
2011/0263318	12/2010	Agarwal	N/A	N/A
2011/0269548	12/2010	Barclay	N/A	N/A
2011/0306400	12/2010	Nguyen	N/A	N/A
2011/0306426	12/2010	Novak	N/A	N/A
2012/0015709	12/2011	Bennett	N/A	N/A
2012/0028703	12/2011	Anderson	N/A	N/A
2012/0028718	12/2011	Barclay	N/A	N/A
2012/0034968	12/2011	Watkins	N/A	N/A
2012/0046110	12/2011	Amaitis	N/A	N/A
2012/0094769	12/2011	Nguyen	N/A	N/A
2012/0100908	12/2011	Wells	N/A	N/A

2012/0108319	12/2011	Caputo	N/A	N/A
2012/0122561	12/2011	Hedrick	N/A	N/A
2012/0122567	12/2011	Gangadharan	N/A	N/A
2012/0122584	12/2011	Nguyen	N/A	N/A
2012/0122590	12/2011	Nguyen	N/A	N/A
2012/0172130	12/2011	Acres	N/A	N/A
2012/0184362	12/2011	Barclay	N/A	N/A
2012/0184363	12/2011	Barclay	N/A	N/A
2012/0185398	12/2011	Weis	N/A	N/A
2012/0190426	12/2011	Acres	N/A	N/A
2012/0194448	12/2011	Rothkopf	N/A	N/A
2012/0208618	12/2011	Frerking	N/A	N/A
2012/0231885	12/2011	Speer, II	N/A	N/A
2012/0239566	12/2011	Everett	N/A	N/A
2012/0322563	12/2011	Nguyen	N/A	N/A
2012/0330740	12/2011	Pennington	N/A	N/A
2013/0005433	12/2012	Holch	N/A	N/A
2013/0005443	12/2012	Kosta	N/A	N/A
2013/0005453	12/2012	Nguyen	N/A	N/A
2013/0059650	12/2012	Sylla	N/A	N/A
2013/0065668	12/2012	Lemay	N/A	N/A
2013/0103965	12/2012	Golembeski, Jr.	N/A	N/A
2013/0104193	12/2012	Gatto	N/A	N/A
2013/0130766	12/2012	Harris	N/A	N/A
2013/0132745	12/2012	Schoening	N/A	N/A
2013/0165210	12/2012	Nelson	N/A	N/A
2013/0185559	12/2012	Morel	N/A	N/A
2013/0196756	12/2012	Nguyen	N/A	N/A
2013/0196776	12/2012	Nguyen	N/A	N/A
2013/0210513	12/2012	Nguyen	N/A	N/A
2013/0210514	12/2012	Nguyen	N/A	N/A
2013/0210530	12/2012	Nguyen	N/A	N/A
2013/0225279	12/2012	Patceg	N/A	N/A
2013/0225282	12/2012	Williams	N/A	N/A
2013/0231192	12/2012	Walker	N/A	N/A
2013/0252730	12/2012	Joshi	N/A	N/A
2013/0281187	12/2012	Skelton	N/A	N/A
2013/0281188	12/2012	Guinn	N/A	N/A
2013/0316808	12/2012	Nelson	N/A	N/A
2013/0337878	12/2012	Shepherd	N/A	N/A
2013/0337889	12/2012	Gagner	N/A	N/A
2014/0006129	12/2013	Heath	N/A	N/A
2014/0057716	12/2013	Massing	N/A	N/A
2014/0087862	12/2013	Burke	N/A	N/A
2014/0094295	12/2013	Nguyen	N/A	N/A
2014/0094316	12/2013	Nguyen	N/A	N/A
2014/0121005	12/2013	Nelson	N/A	N/A
2014/0179431	12/2013	Nguyen	N/A	N/A
2014/0235332	12/2013	Block	N/A	N/A
2014/0274306	12/2013	Crawford, III	N/A	N/A

2014/0274309	12/2013	Nguyen	N/A	N/A
2014/0274319	12/2013	Nguyen	N/A	N/A
2014/0274320	12/2013	Nguyen	N/A	N/A
2014/0274342	12/2013	Nguyen	N/A	N/A
2014/0274357	12/2013	Nguyen	N/A	N/A
2014/0274360	12/2013	Nguyen	N/A	N/A
2014/0274367	12/2013	Nguyen	N/A	N/A
2014/0274388	12/2013	Nguyen	N/A	N/A
2015/0089595	12/2014	Telles	N/A	N/A
2015/0133223	12/2014	Carter, Sr.	N/A	N/A
2015/0143543	12/2014	Phegade	N/A	N/A
2016/0125695	12/2015	Nguyen	N/A	N/A
2017/0116819	12/2016	Nguyen	N/A	N/A
2017/0116823	12/2016	Nguyen	N/A	N/A
2017/0144071	12/2016	Nguyen	N/A	N/A
2017/0148259	12/2016	Nguyen	N/A	N/A
2017/0148261	12/2016	Nguyen	N/A	N/A
2017/0148263	12/2016	Nguyen	N/A	N/A
2017/0154497	12/2016	Nguyen	N/A	N/A
2017/0206734	12/2016	Nguyen	N/A	N/A
2017/0228979	12/2016	Nguyen	N/A	N/A
2017/0243440	12/2016	Nguyen	N/A	N/A
2017/0337770	12/2016	Nguyen	N/A	N/A
2018/0144581	12/2017	Nguyen	N/A	N/A
2019/0005773	12/2018	Nguyen	N/A	N/A
2019/0122490	12/2018	Nguyen	N/A	N/A
2019/0122492	12/2018	Nguyen	N/A	N/A
2019/0213829	12/2018	Nguyen	N/A	N/A
2020/0372753	12/2019	Nguyen	N/A	N/A

#### **FOREIGN PATENT DOCUMENTS**

<b>Patent No.</b>	<b>Application Date</b>	<b>Country</b>	<b>CPC</b>
2033638	12/1979	GB	N/A
2062923	12/1980	GB	N/A
2096376	12/1981	GB	N/A
2097570	12/1981	GB	N/A
2335524	12/1998	GB	N/A
12005000454	12/2006	JP	N/A
2005073933	12/2004	WO	N/A
2008027621	12/2007	WO	N/A
2009026309	12/2008	WO	N/A
2009062148	12/2008	WO	N/A
2010017252	12/2009	WO	N/A

#### **OTHER PUBLICATIONS**

Advisory Action for U.S. Appl. No. 13/632,828, mailed Feb. 25, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/801,234, dated Mar. 8, 2016. cited by applicant  
Office Action for U.S. Appl. No. 14/216,986, dated Mar. 9, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,271, dated Mar. 11, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/622,702, dated Mar. 22, 2016. cited by applicant

Final Office Action for U.S. Appl. No. 13/633,118, dated Mar. 24, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 14/189,948, dated Apr. 6, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,610, dated Apr. 21, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 14/017,150, dated Apr. 26, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,121, dated May 11, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 14/017,159, dated Jun. 6, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/801,171, dated Jun. 6, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/843,192, dated Jun. 9, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 12/945,888, dated Jun. 28, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/833,953, dated Jul. 6, 2016. cited by applicant  
Office Action for U.S. Appl. No. 14/211,536, dated Jul. 13, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/801,076, dated Jul. 11, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/296,182, dated Jul. 20, 2016. cited by applicant  
Restriction Requirement for U.S. Appl. No. 13/296,182, dated Oct. 12, 2012. cited by applicant  
Advisory Action for U.S. Appl. No. 13/843,192, dated May 8, 2014. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/843,192, mailed Aug. 10, 2016. cited by applicant  
Office Action for U.S. Appl. No. 14/217,066, dated Dec. 22, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 14/216,986, dated Sep. 23, 2016. cited by applicant  
Office Action for U.S. Appl. No. 14/017,159, dated Sep. 23, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/632,743, dated Sep. 23, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,234, dated Oct. 14, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/843,087, dated Oct. 13, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/622,702, dated Oct. 13, 2016. cited by applicant  
Office Action for U.S. Appl. No. 14/189,948, dated Nov. 7, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 14/211,536, dated Nov. 14, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/833,116, dated Oct. 11, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/801,271, dated Dec. 2, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/797,610, dated Dec. 7, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/632,828, dated Dec. 16, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,171, dated Dec. 19, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/211,536, dated Dec. 28, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/801,256, dated Jan. 20, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,171, dated May 21, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,234, dated May 22, 2014. cited by applicant  
Advisory Action for U.S. Appl. No. 13/296,182, dated May 8, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 15/495,975, dated Apr. 18, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/671,133, dated May 1, 2019. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/216,986, dated May 17, 2019. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/518,909, dated May 17, 2019. cited by applicant  
Office Action for U.S. Appl. No. 12/797,616, dated Jun. 5, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/427,308, dated Jun. 14, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/811,654, dated Jun. 14, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/674,480, dated Jun. 20, 2019. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/835,448, dated Jul. 3, 2019. cited by applicant  
Final Office Action for U.S. Appl. No. 16/162,358, dated Jul. 11, 2019. cited by applicant  
Decision on Appeal for U.S. Appl. No. 15/427,308, mailed Sep. 10, 2021. cited by applicant  
U.S. Appl. No. 13/833,953, filed Mar. 15, 2013. cited by applicant  
U.S. Appl. No. 12/619,672, filed Nov. 16, 2009. cited by applicant  
U.S. Appl. No. 13/801,121, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 12/581,115, filed Oct. 17, 2009. cited by applicant



U.S. Appl. No. 13/801,076, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 13/617,717, filed Nov. 12, 2009. cited by applicant  
U.S. Appl. No. 13/633,118, filed Oct. 1, 2012. cited by applicant  
U.S. Appl. No. 12/797,610, filed Jun. 10, 2010. cited by applicant  
U.S. Appl. No. 13/801,256, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 12/757,968, filed Apr. 9, 2010. cited by applicant  
U.S. Appl. No. 12/797,616, filed Jun. 10, 2010. cited by applicant  
U.S. Appl. No. 13/557,063, filed Jul. 24, 2012. cited by applicant  
U.S. Appl. No. 13/833,116 filed Mar. 15, 2013. cited by applicant  
U.S. Appl. No. 13/801,271, filed Mar. 13, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/945,888 dated Apr. 10, 2012. cited by applicant  
Final Office Action for U.S. Appl. No. 12/945,888 dated Sep. 21, 2012. cited by applicant  
Advisory Action for U.S. Appl. No. 12/945,888 dated Jan. 30, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/581,115 dated Dec. 20, 2011. cited by applicant  
Final Office Action for U.S. Appl. No. 12/581,115 dated Sep. 13, 2012. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/581,115 dated May 24, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/619,672 dated Dec. 20, 2011. cited by applicant  
Final Office Action for U.S. Appl. No. 12/619,672 dated Nov. 6, 2012. cited by applicant  
Office Action for U.S. Appl. No. 12/619,672 dated Mar. 7, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/617,717 dated Oct. 4, 2011. cited by applicant  
Office Action for U.S. Appl. No. 12/617,717 dated Apr. 4, 2012. cited by applicant  
Advisory Action for U.S. Appl. No. 12/617,717 dated Jun. 12, 2011. cited by applicant  
Office Action for U.S. Appl. No. 12/617,717, dated Jun. 17, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/797,610 dated Dec. 8, 2011. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,610 dated Jun. 6, 2012. cited by applicant  
Office Action for U.S. Appl. No. 12/797,610 dated Feb. 26, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/757,968, dated May 9, 2012. cited by applicant  
Final Office Action for U.S. Appl. No. 12/757,968, dated Nov. 29, 2012. cited by applicant  
Office Action for U.S. Appl. No. 12/757,968, dated Apr. 25, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/797,616 dated Mar. 15, 2012. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,616 dated Oct. 13, 2012. cited by applicant  
Office Action for U.S. Appl. No. 12/797,616 dated Feb. 13, 2013. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,616 dated May 8, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/296,182 dated Dec. 5, 2012. cited by applicant  
Brochure, 5000 Ft. Inc., 1 page, Nov. 2010. cited by applicant  
Frontier Fortune game, email notification, MGM Resorts Intl., Aug. 9, 2013. cited by applicant  
“Getting Back in the Game: Geolocation Can Ensure Compliance with New iGaming Regulations”,  
White Paper, Quova, Inc., 2010. cited by applicant  
Notice of Allowance of U.S. Appl. No. 12/619,672, dated Aug. 23, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/633,118, dated Sep. 20, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/801,256, dated Jul. 2, 2013. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/619,672, dated Oct. 3, 2013. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/757,968, dated Oct. 11, 2013. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,610, dated Jul. 10, 2013. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/757,968, dated Dec. 18, 2013. cited by applicant  
Office Action for U.S. Appl. No. 12/945,889, dated Dec. 18, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/632,828, dated Jul. 30, 2013. cited by applicant  
Restriction Requirement for U.S. Appl. No. 13/801,256, dated Dec. 30, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/801,171, dated Dec. 26, 2013. cited by applicant  
Office Action for U.S. Appl. No. 13/801,234, dated Jan. 10, 2014. cited by applicant

Final Office Action for U.S. Appl. No. 13/296,182, dated Feb. 12, 2014. cited by applicant  
Office Action for U.S. Appl. No. 12/617,717, dated Feb. 25, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,076, dated Mar. 28, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 13/633,118, dated Apr. 3, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/843,192, dated Apr. 3, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/632,743, dated Apr. 10, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,121, dated Apr. 11, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 12/945,889, dated Jun. 30, 2014. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/617,717, dated Jul. 14, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,121, dated Sep. 24, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,171, dated Sep. 22, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,234, dated Oct. 1, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,271, dated Oct. 31, 2014. cited by applicant  
Final Office Action for No. 13/843, 192, dated Oct. 21, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/632,743, dated Oct. 23, 2014. cited by applicant  
Office Action for U.S. Appl. No. 12/945,889, dated Oct. 23, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/632,828, dated Nov. 7, 2014. cited by applicant  
Office Action for U.S. Appl. No. 12/797,610, dated Dec. 15, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 12/945,889, dated Feb. 12, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801, 171, dated Mar. 16, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/833,116, dated Mar. 27, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/632,828, mailed Apr. 10, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,121, dated Apr. 21, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/557,063, dated Apr. 28, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/296,182, dated Jun. 5, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/843,192, dated Jun. 19, 2015. cited by applicant  
Office Action for U.S. Appl. No. 12/797,610, dated Jul. 14, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/833,953, dated Jul. 17, 2015. cited by applicant  
Notice of Allowance for U.S. Appl. No. 12/945,889, dated Jul. 22, 2015. cited by applicant  
Office Action for U.S. Appl. No. 12/797,616, dated Aug. 10, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,234, dated Aug. 14, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/833,116, dated Sep. 24, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/801,121, dated Oct. 2, 2015. cited by applicant  
Office Action for U.S. Appl. No. 14/017,150, dated Oct. 7, 2015. cited by applicant  
Office Action for U.S. Appl. No. 14/017,159, dated Oct. 7, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/801,271 dated Oct. 19, 2015. cited by applicant  
Office Action for U.S. Appl. No. 14/211,536 dated Oct. 19, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/632,828, dated Oct. 22, 2015. cited by applicant  
Office Action for U.S. Appl. No. 14/217,066, dated Dec. 17, 2015. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/557,063, dated Dec. 23, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/296,182, dated Dec. 23, 2015. cited by applicant  
Final Office Action for U.S. Appl. No. 13/843,192, dated Dec. 30, 2015. cited by applicant  
Office Action for U.S. Appl. No. 13/801,076, dated Jan. 11, 2016. cited by applicant  
Office Action for U.S. Appl. No. 12/945,888, dated Jan. 22, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,616, dated Jun. 12, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/843,087, dated Feb. 25, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/800,917, dated Feb. 25, 2016. cited by applicant  
Advisory Action for U.S. Appl. No. 13/801,121, dated Jul. 19, 2016. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/293,751, dated Aug. 4, 2017. cited by applicant  
Advisory Action for U.S. Appl. No. 14/189,948, dated Jul. 28, 2017. cited by applicant

Final Office Action for U.S. Appl. No. 13/801,256, dated Aug. 15, 2014. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,256, dated Feb. 18, 2015. cited by applicant  
Advisory Action for U.S. Appl. No. 13/801,256, dated Dec. 5, 2014. cited by applicant  
Office Action for U.S. Appl. No. 13/801,256, dated Jan. 12, 2016. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,256, dated Aug. 16, 2016. cited by applicant  
Office Action for U.S. Appl. No. 13/622,702, dated Aug. 31, 2017. cited by applicant  
Office Action for U.S. Appl. No. 12/945,888, dated Sep. 1, 2017. cited by applicant  
Office Action for U.S. Appl. No. 14/017,150, dated Sep. 7, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/189,948, dated Sep. 13, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/138,086, dated Oct. 19, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/402,945 dated Nov. 21, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 13/801,171, dated Dec. 13, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 15/271,488, dated Dec. 21, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/671,133, dated Dec. 22, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 14/216,986, dated Dec. 26, 2017. cited by applicant  
Restriction Requirement for U.S. Appl. No. 15/427,307, dated Jan. 17, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/798,363, dated Jan. 26, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/427,291, dated Jan. 29, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 14/017,159, dated Feb. 1, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 13/622,702, dated Feb. 22, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/811,654, dated Feb. 22, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 13/622,702, dated Feb. 27, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 15/427,308, dated Mar. 19, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/876,095, dated Apr. 3, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/835,448, dated Apr. 4, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/427,307, dated Apr. 9, 2018. cited by applicant  
Office Action for U.S. Appl. No. 14/216,986, dated Apr. 6, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/426,898 dated Apr. 16, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/402,945, dated May 25, 2018. cited by applicant  
Benston, Liz, "Harrahs Launches iPhone App; Caesars Bypasses Check-in," Las Vegas Sun, Las Vegas, NV. Jan. 8, 2010. cited by applicant  
Finnegan, Amanda, "Casinos Connecting with Customers via iPhone Apps", May 27, 2010, Las Vegas Sun, Las Vegas, NV. cited by applicant  
Gaming Today Staff, "Slots showcased at 2009 National Indian Gaming Assoc.", GamingToday.com, Apr. 14, 2009. cited by applicant  
Green, Marian, "Testing Texting Casino Journal", Mar. 2, 2009. cited by applicant  
Hasan, Ragib, et al., "A Survey of Peer-to-Peer Storage Techniques for Distributed File Systems", National Center for Supercomputing Applications, Department of Computer Science, University of Illinois at Urbana Champaign, Jun. 27, 2005. cited by applicant  
Jones, Trahern, "Telecon-equipped drones could revolutionize wireless market", azcentral.com, <http://www.azcentral.com/business/news/articles/20130424telecom-equipped-drones-could-revolutionize-wireless-market.html>, downloaded Jul. 2, 2013, 2 pages. cited by applicant  
Yancey, Kitty Bean, "Navigate Around Vegas with New iPhone Apps", USA Today, Jun. 3, 2010. cited by applicant  
IAPS, Daily Systems LLC, 2010. cited by applicant  
U.S. Appl. No. 12/945,888, filed Nov. 14, 2010. cited by applicant  
U.S. Appl. No. 12/945,889, filed Nov. 14, 2010. cited by applicant  
U.S. Appl. No. 13/622,702, filed Sep. 19, 2012. cited by applicant  
U.S. Appl. No. 13/800,917, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 13/961,182, filed Nov. 15, 2011. cited by applicant

U.S. Appl. No. 13/801,234, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 13/801,171, filed Mar. 13, 2013. cited by applicant  
U.S. Appl. No. 13/843,087, filed Mar. 15, 2013. cited by applicant  
U.S. Appl. No. 13/632,743, filed Oct. 1, 2012. cited by applicant  
U.S. Appl. No. 13/632,828, filed Oct. 1, 2012. cited by applicant  
Office Action for U.S. Appl. No. 15/495,973, dated Jun. 4, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/427,291 dated Jun. 18, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/271,488, dated Jun. 19, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/480,295, dated Jun. 20, 2018. cited by applicant  
Office Action for U.S. Appl. No. 14/963,106, dated Jun. 22, 2018. cited by applicant  
Office Action for U.S. Appl. No. 14/993,055, dated Jun. 22, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 15/427,307, dated Jul. 9, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/633,118, dated Aug. 3, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/671,133, dated Aug. 9, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/427,308, dated Aug. 15, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/798,363, dated Aug. 29, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/428,922 dated Sep. 17, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/495,975, dated Sep. 21, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/271,488, dated Sep. 24, 2018. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/876,095, dated Sep. 24, 2018. cited by applicant  
Office Action for U.S. Appl. No. 13/622,702, dated Oct. 3, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/293,751, dated Apr. 6, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/801,171, dated Oct. 31, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 15/835,448, dated Nov. 2, 2018. cited by applicant  
Office Action for U.S. Appl. No. 15/480,295, dated Nov. 7, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 14/963,106, dated Dec. 14, 2018. cited by applicant  
Final Office Action for U.S. Appl. No. 14/993,055, dated Dec. 14, 2018. cited by applicant  
Office Action for U.S. Appl. No. 16/162,358, dated Dec. 31, 2018. cited by applicant  
Office Action for U.S. Appl. No. 14/017,159, dated Jan. 11, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/426,898, dated Jan. 11, 2019. cited by applicant  
Final Office Action for U.S. Appl. No. 15/495,973, dated Jan. 11, 2019. cited by applicant  
Office Action for U.S. Appl. No. 14/216,986, dated Jan. 14, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/427,307, dated Jan. 18, 2019. cited by applicant  
Final Office Action for U.S. Appl. No. 15/798,363, dated Feb. 4, 2019. cited by applicant  
Office Action for U.S. Appl. No. 16/125,614, dated Feb. 25, 2019. cited by applicant  
Office Action for U.S. Appl. No. 13/800,917, dated Feb. 3, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 12/797,616, dated Feb. 10, 2017. cited by applicant  
Office Action for U.S. Appl. No. 12/945,888, dated Feb. 28, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 14/189,948, dated Mar. 17, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/400,840, dated Mar. 10, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 13/801,121, dated Mar. 29, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/270,333, dated Mar. 30, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/402,945, dated Apr. 5, 2017. cited by applicant  
Office Action for U.S. Appl. No. 15/271,488, dated Apr. 19, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 14/217,066, dated Apr. 21, 2017. cited by applicant  
Office Action for U.S. Appl. No. 14/216,986 dated Apr. 26, 2017. cited by applicant  
Office Action for U.S. Appl. No. 13/801,171, dated Jun. 14, 2017. cited by applicant  
Office Action for U.S. Appl. No. 14/017,159, dated Jun. 29, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/270,333, dated Jul. 5, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 13/800,917, dated Jul. 13, 2017. cited by applicant

Notice of Allowance for U.S. Appl. No. 13/801,234, dated Jul. 5, 2017. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/217,066, dated Jul. 14, 2017. cited by applicant  
Final Office Action for U.S. Appl. No. 14/518,909, dated Jul. 19, 2017. cited by applicant  
Non-Final Office Action for U.S. Appl. No. 13/801,121, dated Sep. 15, 2016. cited by applicant  
Advisory Action for U.S. Appl. No. 13/801,121, dated Jul. 17, 2015. cited by applicant  
Office Action for U.S. Appl. No. 17/020,761, mailed Sep. 9, 2021. cited by applicant  
Office Action for U.S. Appl. No. 16/916,001, mailed Sep. 17, 2021. cited by applicant  
Notice of Allowance for U.S. Appl. No. 16/870,802, mailed Sep. 22, 2021. cited by applicant  
Advisory Action for U.S. Appl. No. 13/632,828, dated Feb. 25, 2016. cited by applicant  
Office Action (Non-Final Rejection) dated May 11, 2023 for U.S. Appl. No. 17/511,532 (pp. 1-8).  
cited by applicant  
Office Action (Notice of Allowance and Fees Due (PTOL-85)) dated Jan. 9, 2024 for U.S. Appl.  
No. 17/511,532 (pp. 1-8). cited by applicant  
Office Action for U.S. Appl. No. 16/190,050, dated Sep. 19, 2019. cited by applicant  
Office Action for U.S. Appl. No. 14/017,150, dated Oct. 9, 2019. cited by applicant  
Final Office Action for U.S. Appl. No. 15/671,133, dated Oct. 18, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/835,448, dated Oct. 22, 2019. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/495,975, dated Oct. 23, 2019. cited by applicant  
Notice of Allowance for U.S. Appl. No. 14/993,005, dated Nov. 27, 2019. cited by applicant  
Final Office Action for U.S. Appl. No. 15/427,308, dated Nov. 27, 2019. cited by applicant  
Office Action for U.S. Appl. No. 15/798,363, dated Jan. 8, 2020. cited by applicant  
Office Action for U.S. Appl. No. 15/495,975, dated Mar. 17, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/248,759, dated Apr. 1, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 14/017,150, dated Apr. 17, 2020. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/798,363, dated May 12, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/357,316, dated May 21, 2020. cited by applicant  
Office Action for U.S. Appl. No. 15/674,480, dated Jun. 5, 2020. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/480,295, dated Jun. 15, 2020. cited by applicant  
Office Action for U.S. Appl. No. 13/622,702, dated Jun. 22, 2020. cited by applicant  
Office Action for U.S. Appl. No. 15/811,654, dated Jun. 26, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/579,754, dated Jul. 22, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/219,940, dated Jul. 22, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/559,553, dated Sep. 11, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/794,212, dated Sep. 11, 2020. cited by applicant  
Restriction Requirement for U.S. Appl. No. 16/600,395, dated Sep. 18, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 16/248,759, dated Oct. 6, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 15/671,133, dated Oct. 7, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 16/357,316, dated Oct. 8, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 16/183,632, dated Oct. 9, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/590,347, dated Oct. 13, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/449,717, dated Nov. 9, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 13/622,702, dated Nov. 30, 2020. cited by applicant  
Final Office Action for U.S. Appl. No. 15/674,480, dated Dec. 7, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/168,813, dated Dec. 8, 2020. cited by applicant  
Office Action for U.S. Appl. No. 16/600,395, dated Dec. 22, 2020. cited by applicant  
“Professional Casino Slot Machine”, Posted at [www.vbtutor.net/VB. Sample/vbslot2.htm](http://www.vbtutor.net/VB.Sample/vbslot2.htm) on Oct.  
20, 2009. cited by applicant  
Final Office Action for U.S. Appl. No. 16/559,553, dated Jan. 21, 2021. cited by applicant  
Final Office Action for U.S. Appl. No. 16/449,717, dated Jan. 29, 2021. cited by applicant  
Notice of Allowance for U.S. Appl. No. 15/811,654, dated Feb. 3, 2021. cited by applicant

Notice of Allowance for U.S. Appl. No. 14/017,150, dated Feb. 5, 2021. cited by applicant  
Final Office Action for U.S. Appl. No. 16/794,212, dated Feb. 17, 2021. cited by applicant  
Office Action for U.S. Appl. No. 16/351,416, dated Feb. 23, 2021. cited by applicant  
Office Action for U.S. Appl. No. 15/674,480, dated Mar. 25, 2021. cited by applicant  
Final Office Action for U.S. Appl. No. 16/219,940, dated Mar. 26, 2021. cited by applicant  
Office Action for U.S. Appl. No. 16/183,632, dated May 4, 2021. cited by applicant  
Office Action for U.S. Appl. No. 16/559,553, mailed Jun. 1, 2021. cited by applicant  
Notice of Allowance for U.S. Appl. No. 16/579,754, mailed Jul. 16, 2021. cited by applicant  
Office Action for U.S. Appl. No. 13/622,702, mailed Jul. 19, 2021. cited by applicant  
Office Action for U.S. Appl. No. 16/357,316, mailed Jul. 20, 2021. cited by applicant  
Office Action for US Patent Application No. 16/993,154, mailed Jul. 28, 2021. cited by applicant  
Final Office Action for U.S. Appl. No. 16/351,416, mailed Sep. 1, 2021. cited by applicant  
Office Action for US Patent Application No. 15/671,133, mailed Sep. 2, 2021. cited by applicant  
Notice of Allowance for U.S. Appl. No. 16/794,212, mailed Sep. 3, 2021. cited by applicant

---

*Primary Examiner:* Galka; Lawrence S

*Attorney, Agent or Firm:* Weaver Austin Villeneuve & Sampson LLP

---

## **Background/Summary**

RELATED APPLICATIONS (1) The present application is a continuation of and claims priority to U.S. patent application Ser. No. 17/511,532, filed Oct. 26, 2021, which is a continuation of and claims priority to U.S. patent application Ser. No. 15/427,308, filed on Feb. 8, 2017, now abandoned, which is a continuation of and claims priority to U.S. patent application Ser. No. 13/801,271, filed on Mar. 13, 2013, which issued on Mar. 28, 2017, as U.S. Pat. No. 9,607,474, which are hereby incorporated by reference in their entireties.

## **BACKGROUND OF THE INVENTION**

(1) Casinos have long sought new ways to induce play on the gaming devices. They try to increase player time on gaming devices, average wager amount, and speed of play. Various techniques have been used in attempts to gain higher casino profits. One such technique in the casino gaming industry is the addition of bonus opportunities. This usually takes the form of an additional bonus game in conjunction with a base game of a gaming device.

(2) As another avenue to encourage play, casinos adopted a new technology in the form of player tracking systems. In a player tracking systems a player registers for a player-tracking card at a registration desk. The player is typically given a plastic magnetic strip player card for use while playing gaming devices on the casino floor or at the card tables. Each player card has an ID on it that associates it with a player record in a player tracking database. Players are awarded loyalty points, credits or other representations of value. Such awards can then be redeemed at a later time.

(3) More recent additions to the casino player loyalty systems provide bonus prizes or prize pools that are periodically given to players on a random basis (e.g. mystery bonusing, mystery jackpot). This gives the player a more instantaneous and larger reward versus the slow accrual of loyalty points. This is done for several reasons: to help induce play on the gaming device, to encourage players to become carded players; to create player loyalty for the casino, and to provide bonus prizes without modifying the base gaming device software.

(4) However, these methods of awarding bonuses have several limitations. They may require that a player become a member of a club when they wish to remain anonymous. Also, these methods require that a casino patron be engaged in wagering activities.

(5) Group games involving many players are known to be implemented in a predefined area, where a number of gaming machines on the casino floor are roped off for the special event. Only machines within the enclosed area are eligible for participating in a group game or a bonusing award. One popular game type set up in this manner is the slot tournament game. From the casino operator's perspective, such a rigid physical configuration is time-consuming to set up, tying up valuable assets, and lack the flexibility to be reconfigured quickly. From the player's perspective, such an approach also requires them to move around to find the sweet spot—the location where the special machines and awards are set up. Not only this is inconvenient for some players, it interrupts their wagering activities.

(6) With the advent of mobile technology, additional opportunities for accommodating casino patrons have arisen. Handheld gaming devices allow players to participate in wagering activities in traditional, as well as non-traditional gaming areas, such as a hotel room, a restaurant, or next to a pool. Certain restrictions apply to handheld gaming devices, in which the device's location determines the eligibility of the device to conduct wagering activities or particular game-related features.

(7) There is a continuing need to provide new and different gaming devices and gaming systems as well as new and flexible ways to provide awards to players on mobile and traditional gaming devices, including bonus awards and special game features that enhance their playing experiences.

## SUMMARY

(8) Embodiments are described herein in the context of a reconfigurable gaming zone. The present disclosure relates generally to gaming systems, more specifically to game events control systems with in a gaming system, and even more specifically to game events control systems to reconfigure gaming zones in gaming systems.

(9) In one embodiment, a method of operating a zone-based gaming activity includes generating, in response to a request, a reconfigurable zone, determining one or more eligible participants, and modifying said zone to change the number of eligible participants.

(10) In another embodiment, a method for configuring the operating constraints of a zone-based gaming activity including defining a location for deploying the zone, defining the size of a zone, defining one or more criteria for selecting eligible participants, and defining one or more criteria for modifying the zone.

(11) In still another embodiment, a method of operating a zone-based gaming activity includes randomly generating, in response to a request, a location of a reconfigurable zone, randomly determining one or more eligible participants, and modifying said zone to change the number of eligible participants.

(12) The present invention provides other hardware configured to perform the methods of the invention, as well as software stored in a machine-readable medium (e.g., a tangible storage medium) to control devices to perform these methods. These and other features will be presented in more detail in the following detailed description of the invention and the associated figures.

---

## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

(1) The accompanying drawings, which are incorporated into and constitute a part of this specification, illustrate one or more example embodiments and, together with the description of example embodiments, serve to explain the principles and implementations.

(2) In the drawings:

(3) FIG. 1 illustrates an example schematic of a gaming network.

(4) FIG. 2 illustrates an example method for configuring zone-based game play.

(5) FIG. 3 illustrates an example flow chart for zone modification.

(6) FIG. 4 illustrates an example flow chart for the zone reduction step.

(7) FIGS. 5A-5D illustrate example zone configurations and zone reductions.

#### DESCRIPTION OF EXAMPLE EMBODIMENTS

(8) Embodiments are described herein in the context of a reconfigurable award zone. The following detailed description is illustrative only and is not intended to be in any way limiting. Other embodiments will readily suggest themselves to such skilled persons having the benefit of this disclosure. Reference will now be made in detail to implementations as illustrated in the accompanying drawings. The same reference indicators will be used throughout the drawings and the following detailed description to refer to the same or like parts.

(9) In the interest of clarity, not all of the routine features of the implementations described herein are shown and described. It will, of course, be appreciated that in the development of any such actual implementation, numerous implementation-specific decisions must be made in order to achieve the developer's specific goals, such as compliance with application- and business-related constraints, and that these specific goals will vary from one implementation to another and from one developer to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking of engineering for those of ordinary skill in the art having the benefit of this disclosure.

(10) In accordance with the present invention, the components, process steps, and/or data structures may be implemented using various types of operating systems, computing platforms, computer programs, and/or general purpose machines. In addition, those of ordinary skill in the art will recognize that devices of a less general purpose nature, such as hardwired devices, field programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), or the like, may also be used without departing from the scope and spirit of the inventive concepts disclosed herein.

(11) FIG. 1 illustrates an example schematic of a gaming system. The gaming system, identified in its broadest aspects as **100**, may be configured to communicate and/or control a plurality of gaming devices or electronic gaming machines (EGMs) **135** and a plurality of mobile gaming devices (MGDs) **125**. The gaming system **100** may have a game server **130** configured to communicate with a zone controller **140**, location tracker **110**, player tracking server **150**, configuration database **160**, and accounting server **170**.

#### (12) Zone Controller

(13) The zone controller **140** conducts the operation of the reconfigurable award zone game. In one embodiment, the zone controller **140** may be a standalone local controller networked with the plurality of EGMs **135** within a specific area (e.g., such as a carousel of slot machines, gaming devices near the door, and the like) and/or a number of MGDs **125** that are grouped together in a logical group (e.g., spinning reels slot machines, video poker devices, table games, progressive slots, mobile gaming devices, and the like). In another embodiment, the zone controller may be integrated in the EGMs **135**. When integrated in EGMs **135**, the zone controller is a software application that runs inside the gaming device or slot machine, leveraging hardware available within the slot machine to perform its functions. Regardless of whether the zone controller is implemented as a standalone device or a software application, the zone controller can be located near the EGMs **135** to simplify network connections, or can be located remotely from the EGMs **135** and communicating over a suitable network.

(14) The zone controller **140** may communicate with the MGD **125** and EGM **135** via either a wireless link, a wired connection, or an optical connection. The network architecture may be that of a client-server network, a token-ring network, a peer-to-peer network, or an ad-hoc wireless network. Though not a requirement, it is desirable for the zone controller to be able to have both wired and wireless capabilities. In one embodiment, the zone controller may be configured for networking with fixed gaming devices over a wired Ethernet network, networking with mobile gaming devices over a short range Bluetooth wireless network, and networking with the system



servers (such as Player Tracking server, Location Tracking server, etc.) over a longer range WiFi, WiMax, or Cellular connection. In another embodiment, the entire network connection may be wireless.

(15) When using wireless communication, any type of standard or protocol may be used to implement the communication. Examples of acceptable wireless communication protocols include CDMA, GSM, and related derivatives. In one example, the zone controller **140** uses a wireless communication standard such as Bluetooth™ to communicate with portable wireless devices, although other wireless communication protocols such as IrDA (Infrared Direct Access), IEEE 802.11n, IEEE 802.11b, IEEE 802.11x (e.g. other IEEE 802.11 standards), Zigbee, Wireless USB, Ultra Wide Band, Near Field Communication (NFC), and HomeRF may also be used. Any type of wireless transmission may be implemented as well, including but not limited to optical, electromagnetic energy, radio or other frequency communication and infrared-type communications.

(16) In a typical deployment cycle, the zone controller **140** retrieves the operating parameters of the award zone, implements the parameters to create an award zone, provisions the zone-based game feature, selects the eligible participants, notifies them, operates the periodic zone modification, determines the new number of participants, notifies them, stores the game states, monitors for the zone modification signal, decides if the gaming ending condition occurred, and awards the prize(s) to the remaining eligible participant(s) when the game ends, if applicable.

(17) Antenna and Wireless Interface

(18) In one embodiment, zone controller **140** may be configured to communicate with MGD **125** and EGM **135** via an antenna **115**. Antenna **115** may receive and transmit signals to and from the game system **100** and receive and transmit signals from a wireless interface **145** of the MGD **125** or EGMs **135**. As is known in the art, the wireless interface **145** may also operate to demodulate, decode and otherwise process information to and from remote locations. Any known wire or optical communication system may be used and are well known in the art and will not be discussed in detail herein.

(19) Gaming Devices

(20) Both the EGMs **135** and MGDs **125** may be referred to as gaming devices. The electronic gaming machines (EGMs) **135** may correspond to gaming devices typically found in the gaming environment such as slot machines, video poker machines, video blackjack machines, video keno machines, video bingo machines, pachinko machines, and video lottery terminals. In one embodiment, the EGMs may be positioned at or near play table games so that for players who prefer to play table games, the zone controller **140** may communicate with the gaming devices associated with players at the gaming tables. The EGM **135** may also be smart TVs, kiosks, or electronic game tables such as electronic tables made by well known gaming manufacturers such as Digideal Corporation, Elektroncek, Shuffle Master, Pokertek, and others.

(21) The mobile gaming devices (MGDs) **125** may be any portable electronic device such as a cell phone, a smart phone, a portable media player, a laptop computer, a tablet computer, a portable gaming device, a personal digital assistant or the like.

(22) Thus, it is contemplated that communication between the zone controller **140** and EGM **135** and MGD **125** may be located within the gaming establishment where players are allowed by gaming regulations to participate in a gaming activity. When a zone controller **140** notifies EGM **135** and MGD **125** that they are eligible to participate in the zone play, the notification goes to all devices in the manner that is appropriate for that device. By looking up the EGM's **135** and MGD's **125** registry database, or by querying the device itself, the message can be tailored to the device's capabilities. For example, a slot machine's or EGM's notification may go through the Player Tracking device installed on the machine, while the MGD **125** may receive a text message.

(23) Game Server

(24) Game server **130** may be configured to manage and control the operation of games of chance

played on gaming devices **135** and MGDs **125**. The game server **130** may be configured to store and download games, transmit game software and outcomes relating to the game of chance being played, or, alternatively, be configured to determine a winning game outcome and/or appropriate payout. The game server may be configured to perform any other function desired by the user such as determining bonus events, payouts, and the like.

(25) Accounting Server

(26) Accounting server **170** may be configured to receive, store and transmit accounting information relating to a player's account. Accounting information may include any accounting information such as the amount of input of monies, payment of monies, wagers and similar financial events occurring at the MGD **125** or the EGM **135**. The accounting server **170** may also be configured to store award amounts or running totals associated with particular groups or categories of player preferences, interests or attributes.

(27) Player Tracking Server

(28) Player tracking server **150** may be configured to store player tracking information. Player tracking information may include player tracking points/credits accumulated by the player, the amount of wins and losses by the player, and any other player account information desired to be tracked. The player tracking information may be combined or associated with other player information. For example, a player may be enrolled in the gaming establishment's player club and may be awarded certain complimentary offers as that player accumulates points/credits. In use, after the player registers with the gaming device (e.g. swiping a player tracking card, bumping an NFC-capable smart phone, entering authentication information such as an identification and/or personal identification numbers), the player tracking server **150** can record the player's wagering activity.

(29) Alternative Servers

(30) Although not illustrated in FIG. **1**, gaming system may have other additional servers such as a marketing/promotion server to transmit marketing and promotional information to MGD **125** and/or EGM **135**, auditing server to audit gaming information stored in the various databases, authentication server to authenticate the MGD **125**, EGM **135**, software, and/or players, an administrative server to track expenditures by a player during his visit to the gaming establishment, a game history server to serve up the game's historical track records, a concierge server to assist in making reservations at restaurants or purchasing tickets for entertainment events, and other similar servers.

(31) Configuration Database

(32) Configuration database **160** may be configured to store a plurality of zone information and operating parameters associated with each plurality of zone information. The operating parameters may include information such as the initial zone size, frequency of game deployment, modification type (e.g., expansion or contraction), frequency of game modification, the number of desired participants, eligibility requirements of participants, rate of modification of the zone, game features (e.g., win multipliers, free spins, mystery bonus, jackpots, and the like) associated with the zone, gaming awards, and any other operating parameters desired by the gaming establishment. The value for each of the plurality of parameters may be predefined or randomly selected. For example, the zone location can be predefined at a specific area within the gaming establishment, such as at coordinate (x, y, z) on a casino floor. The zone location may be any predefined area such as a sphere having a radius of 15 yards. In another example, the radius of the sphere may be randomly selected using a random number generator. In yet another example, the range of the zone location may be randomly chosen within a predefined range appropriate for the gaming establishment such as 1 yard to 25 yards.

(33) Configuration database **160** may also be configured to store gaming data such as game state data and operating data of the reconfigurable award zone game. Storing gaming data of the award zone game allows recovery of the gaming activity and information when unexpected events such as

a power failure, a sudden loss of communication on a mobile gaming device **125**, and the like occur. The stored gaming data allows for recovery of the game of chance after unexpected or expected pauses, such as a prescribed half-time break for the players. Furthermore, the game state and operating data can also be used to reconstruct the game for the purposes of auditing, game analysis, player dispute resolution, and the like. Example game states include initialization state, zone modification state, players notification state, award state, participant determination state, and the like. Example operating data may include the current number of participant in the game, player identification, game of chance selected, the amount of rewards remaining, current zone size and location, current number of zone modification, current time, and the like.

(34) Location Tracker and Database

(35) The location of gaming devices **135** and MGD **125** within the gaming establishment may be determined using location tracker **110**. Location tracker **110** may determine the location of the EGM **135** and MGD **125** within an active zone, time at the specification location, amount of time spent at the location, and any other location information and data. The location information and data may be stored in location database **120**. Although location tracking for fixed devices, such as traditional gaming machines or game tables, may not be necessary, the gaming establishment may still desire to record the location information and data. For mobile gaming devices **125**, location tracker **110** may periodically update the location of each MGD **125**. For example, the location of each MGD **125** may be tracked and updated every ten (10) seconds, thirty (30) seconds, thirty (30) minutes, or any other desired time period. The tracking of both fixed **135** and mobile gaming devices **125** within a zone is important to assure fairness to each of the players.

(36) Any known tracking technology may be used to track the location of the EGM **135** and MGD **125**. For example, U.S. Pat. No. 7,580,995 entitled "Systems and methods for locating mobile computer users in a wireless network" describes a WLAN technology for locating and tracking mobile devices, which is hereby incorporated by reference.

(37) Location and detection of the EGM **135** and/or MGD **125** may be determined as a function of received signal strength indicator (RSSI) values obtained from the EGM **135** and/or MGD **125**. As a general rule, the higher the signal strength at an access point (AP), the closer a transmitting wireless device is presumed to be to the AP. Changes in the signal strength as the wireless device moves about the gaming establishment allows for tracking the wireless device. For example, if there are at least three APs that receive a signal from the wireless device, trilateration/triangulation can be used to determine the location of the device within the gaming establishment. Trilateration is a method of determining the position of the wireless device as a function of the distances between the wireless device and each of the APs. A detailed explanation of trilateration will not be described further to prevent obfuscation of the invention. However, various locationing methods that may be used with the present invention are described in "Location Systems: An Introduction to the Technology Behind Location Awareness," by Anthony LaMarca and Eyal de Lara, Morgan & Claypool Publishers, 2008, ISBN #978-1598295825, which is incorporated herein by reference for all purposes.

(38) Additionally, EGMs **135** and/or MGDs **125** may be operable to include conventional position location hardware and software. For example, the mobile device **125** may include one or more of positioning technologies such as global position system (GPS), wireless assisted GPS (A-GPS), cell identifier (CELL ID), Forward Link Trilateration (FLT), wireless assisted protocol (WAP) based location, geography markup language (GML) based location, and the like. Location tracker **110** may store the location of every EGMs **135** and/or MGDs **125** in database **120**. Location tracking server **110** may track the location of all gaming devices on the casino floor in substantially real time (or as close as possible), and feed the data to database **120**. Location database **120**, in addition to having a live location feed of all gaming devices on the casino floor may also contain a layout of the gaming establishment. This allows the gaming system **100** to know where each EGMs **135** and/or MGDs **125** is within the gaming establishment at any desirable granularity of time. The

gaming establishment may be any location where games of chance may be played such as a casino, hotel, sports bar, riverboat, grocery store, sports stadium, airplane, or the like.

(39) In one embodiment, the gaming devices themselves may determine their own location and transmit its location to the location tracker **110**. Each EGMs **135** and/or MGDs **125** may detect its location within the gaming establishment and transmit its location to location tracker **110** for storage in the location database **120**. In another embodiment, an external, trusted gaming device (e.g. an external device that is registered and authenticated) such as, for example, an intermediary gaming trusted device may be attached to the gaming device and independently detect and transmit the gaming device's location to the location database **120**. The location of the gaming devices **125**, **135** may be determined periodically or on-demand at any desired time interval. In another embodiment, location tracker **110** may ping the gaming devices **125**, **135** for their locations. Once pinged, gaming devices **125**, **135** may transmit their locations to location tracker **110**.

(40) FIG. 2 illustrates an example method for configuring zone-based game play. The process may begin with determining the activity configuration **202**. This includes determining the operating constraints such as the various attributes of the zone, participants, and any other gaming related constraints. For example, the location and initial size of the zones are operating constraints. Additional operating constraints will be discussed below. In one embodiment the operating constraints are determined prior to initiation of the activity and stored in a database, such as configuration database **160** illustrated in FIG. 1. In other embodiments, some of the operating constraints may be determined as needed or desired after initiation of the activity. For example, eligible participant criteria could be selected after initiation if insufficient eligible participants are available with the current criteria. Furthermore, the operating constraints can be preset, or randomly set at the time of deployment of the award or game of chance.

(41) Zone Request

(42) A zone request may be processed at **210**. The zone request may be processed by, for example, a zone controller **140** as illustrated in FIG. 1. The zone request may be made directly and manually by a venue staff member. Alternatively, a venue operator may define zone requests in advance of a zone start time that are stored until the start time, or shortly before the start time, at which point they are processed. The zone initiation process may be scheduled to occur periodically, randomly, or when a predetermined condition is satisfied. For example, when an aggregated bet amount has been wagered in the zone, when there has been two (2) or more four-of-a-kind in the previous two (2) hours, when there were more than 50 game losses within one (1) minute in the zone, when the number of players in an area exceeds 100, or any other similar predetermined conditions.

(43) In another embodiment, the zone request may be processed by a gaming server, such as, for example, gaming server **130** illustrated in FIG. 1. The gaming server may be programmed to automatically generate and process zone requests based on a specific time, the location of gaming devices **125**, **135**, preference information obtained from a player tracking server, such as, for example, player tracking server **150** illustrated in FIG. 1, or any other predefined criteria. For example, a zone initiation request may be generated only if the density of active gaming devices in a particular area reaches a predefined threshold value.

(44) The zone initiation request may be associated with configuration parameters for the zone-based game features to be played. The associated parameters may be retrieved when needed, such as, for example, from database server **160** illustrated in FIG. 1. In an alternative embodiment, the parameters may be retrieved from a memory in the zone controller **140** if the configuration parameter are pre-emptively pushed to the gaming server.

(45) The configuration parameters may be predefined or randomly chosen. The parameters may be within a range of permissible values or operating constraints. The permissible values or operating constraints may be presented by a server, such as, for example, game server **130** or zone controller **140** as illustrated in FIG. 1. The parameters, whether predefined or defined in a zone request, may include at least the identification of the type of game event to be conducted (i.e., progressive

jackpot, mystery bonus, promotional award, free game vouchers give out, upcoming events, win/loss trend for the area, and the like), criteria for starting the game (e.g., a minimum number of participants), zone parameter information, game times (e.g., start and end times), participant eligibility criteria, prize identification, and the like.

(46) The parameters can be grouped into zone initialization parameters (i.e., size, location), game feature parameters (type of game features, casino promotions being conducted, and how they operate), players parameters (i.e., who is eligible, at what level, for how long), zone operating parameters (i.e., contracting zone, expanding zone), and the like.

(47) These above groups may also include parameters such as the initial zone size, frequency of deployment, modification type (expansion or contraction), frequency of modification, the number of desired participants, eligibility requirements of participants, the rate of modification of the zone, the game feature (such as win multipliers, free spins, mystery bonus, jackpots, etc.) to be provisioned for the zone, the one or more awards, and the likes. The value of each parameter can be preset, or randomly chosen. For example, the zone location can be preset at coordinate (x,y,z) on a casino floor, the zone size to be spherical, and the radius of the sphere is 15 yards. These values, when randomly chosen, can be generated by a random number generator to be within one or more ranges that are appropriate for the casino's particular size.

(48) Once the parameters are set, the parameters may be stored in a database, such as, for example, configuration database server **160** as illustrated in FIG. 1, for later retrieval by the zone controller. Alternatively, the parameters may also be pushed from the database to the appropriate zone controller, prior to the activation of the zone activity, for use when triggered by a predefined event (e.g., when there are more than 10 players at 7 pm on or near a game machine carousel).

(49) Zone Activation

(50) A zone must be selected and activated at **220**. In one embodiment, the zone may be selected and activated upon receipt of an activate request. The zone selection can be randomly selected from a set of stored, pre-determined locations. The selection can be made by casino personnel or other individuals with the proper authority. The selection can be made based on past and/or current conditions. For example, areas with low traffic or newly installed gaming machines may be chosen. Another example would be to identify particular areas on days of the week or time of the day and randomly select a location within those areas.

(51) Zone activation for a given activity request may be made by a controller, such as, for example, the zone controller **140** illustrated in FIG. 1. First, a geographic position may be selected from available space or gaming machines, henceforth designated as the focus. The focus will form the approximate center around which a zone is created. The focus needs not to be one dimensional. The focus can be a point, a line, an area, or a volume. It should be understood that because the zone can have an arbitrary shape, the term focus is not restricted to its geometric definition. The focus can be randomly selected or determined by parameters in the zone request. The focus can coincide with a specific gaming device or an arbitrary geographic location. In one embodiment, more than one focus may be selected.

(52) The available space can be defined by a venue operator to be the whole of their property or some subset. Gaming regulations may also restrict the allowable available space. In addition, a casino operator may desire to prevent particular areas from being allowed to be included in a zone. The available area can be predetermined or be set by one of the zone request parameters. The available space does not need to be restricted to one contiguous area. Various embodiments of zone configurations will be discussed in greater detail below.

(53) After the focus is selected an initial zone may be generated based on focus position. The zone can be a predetermined size/shape or obtained from the zone request. Information supplied by the location database server **120** can be used for the generation of the zone. For instance, the casino floor map where gaming devices are located can be provided when the zone is being specified, whether randomly or predefined. The zone can be of any arbitrary shape, such as a circle, triangle,

rectangle, spiral, or any other shape. For example, by specifying a radius associated with the selected geographic position, a circular zone is created. In another example, a line is drawn on the floor map, and locations within 20 feet of the line may be defined to be within the zone (i.e., defining a rectangle centering on the initially drawn line to be the logical boundaries of an active game-event zone).

(54) The zone can be implicitly defined by selecting specific gaming devices near the focus. If more than one focus has been selected, a zone for each focus will be generated. A zone may be associated with a geographic boundary such as the perimeter of a casino floor or banks of gaming devices. A zone may be associated with a logical boundary, corresponding to access points in a wireless network. Optionally, zone parameters may be predetermined and stored in a database, such as, for example, the configuration database server **160** illustrated in FIG. **1**. In this embodiment, the zone parameters may be pushed, pulled, selected, randomly or otherwise, and supplied with the zone request and activation.

#### (55) Participant Determination

(56) With a preliminary zone created, the potential participants may be determined at **230**. The potential participants may be determined by calculating the number of individuals within, near, or adjacent the zone. This may be determined via any known methods. For example, individuals at stationary gaming devices can be located, even if they remain anonymous. Mobile individuals can be located using a location monitoring system, such as a monitoring system described in U.S. Pat. No. 6,353,390, entitled "Method and system of configuring a boundary and tracking an object thereby", which is incorporated by reference herein. It should be understood that any method for locating individuals can be applied.

(57) Depending on the zone request parameters, all individuals may be eligible for participation in the game. Optionally, the zone request parameters may require that only a subset of all individuals within the zone to be eligible, such as players who have been actively playing the gaming device for more than ten (10) minutes. The parameters could be related to player memberships (e.g., Gold Club members), play history (e.g., aggregate expenditures at the venue over the last month), and the like. Such determination may depend on being able to identify the potential participants via a player database, such as, for example, player tracking server **140**. Optionally, an invitation to participate in the game may be transmitted to the gaming devices. The players at the gaming devices may then be required to respond within a specific time interval in order to participate in the event.

(58) A determination of whether gaming rules are satisfied may be made at **240**. If the gaming rules are not satisfied, the method may return to step **220** to re-activate the zone. For example, the number of potential participants may be evaluated. If there are too many potential participants (e.g. as required in the zone request parameters) which does not satisfy the gaming rules at **220**, a zone reduction may occur at **220**. Several methods can be used to reduce the zone. In one embodiment, the physical dimension of the zone can be decreased. For example, the radius of the zone may be decreased. In another example, an area based on a logical unit, such as a bank of gaming machines can be removed. In another example, the number of gaming devices may be removed randomly from the zone.

(59) Alternatively, in another embodiment, the rules may not be satisfied at **240** if there are insufficient potential participants. In this embodiment, the zone may be enlarged at **220**. A physical dimension of the zone can be increased, such as to include more gaming devices. In another example, the area may be based on a logical unit, for example, a bank of gaming machines can be added.

(60) The process of participant determination and zone reconfiguration repeats until the number of potential participants required in the zone request parameters is satisfied. This number does not necessarily have to be a specific number; the zone request parameter could consist of a range of participants. For example, a minimum and maximum number could be specified.

(61) As illustrated above, the players and gaming devices inside of a zone may participate in the zone activity. However, the reverse is also possible. In other words, in one embodiment, only participants and gaming devices outside a zone can participate. In another embodiment, other hybrid approaches may be possible. In one example, a certain percentage of players from outside the zone and a certain percentage of players inside the zone may participate in the game.

#### (62) Saving Game Event State

(63) The state of the game zones and their events may be saved at **250**. The state of the zone may be saved in order to restore the game at a later time. For instance, a power interruption could require that a zone and its associated gaming event be restored when power is re-instituted. In another example, the zone play event may be partitioned into multiple time segments, and needs to be restored upon resumption of the zone activity. The state of a zone and its associated events may be saved periodically and/or at any predetermined time interval. The time interval may be every thirty (30) seconds, every ten (10) seconds, every hour, or any other desired time interval.

(64) The game state information may include the foci, zone parameters, participant information, zone request parameters and any other information required in order to complete the game. The saved data may reside in a database, such as, for example, the configuration database server **160** illustrated in FIG. **1** or in zone controller's **140** memory.

#### (65) Zone Modification

(66) The zone may be modified at **260**. The zone may be modified for any number of reasons. For example, a modification can be made to decrease or to increase the number of participants playing the game. The zone may be increased or decreased at various intervals. The intervals may be predetermined or determined by the game state parameters. For example, in a zone reduction approach, participants that are outside the zone will automatically be removed. In another example, participants can gain access to the zone activity by moving into the zone in order to increase participants in the zone.

(67) A notification may be transmitted to the participants informing them of the zone modification. For example, participants losing eligibility to play the game may be transmitted a removal notification. In another example, participants gaining eligibility, may be transmitted an acceptance notification to be included in the game.

(68) Various indicators can also help the participant identify their current status. For example, pop up window on the player terminal, sounds, screen color change, flashing symbols, and the like may help to indicate whether the participant is part of or not part of the game. Maps of the game floor that include graphical depiction of the zone, the active players, and the eliminated players can also be displayed in the venue and/or at the player terminals as desired.

(69) In one particular implementation that uses the zone reduction approach, after the zone is reduced in size, any participants located outside the zone may be eliminated from the game, either temporarily or permanently eliminated. In another embodiment, a participant may re-enter the activity by moving and playing a gaming device in the modified zone. In yet another embodiment, a participant may be required to satisfy a condition in to re-enter the zone. For example, the condition may be that the participant is offered a chance to buy their way back into the activity. Another condition may require the participant to begin a wagering activity within the zone to again become an eligible participant.

#### (70) Trigger Condition

(71) A determination of whether a trigger condition has occurred may be made at **270**. A trigger condition may be time-based (i.e., the zone-based event expires after 5 minutes, and the like), event-based (i.e., terminate the zone-based activity when a player hits a jackpot, when there is less than a predetermined number of remaining players after a zone reduction, when there is more than 100 players after a zone expansion, when there is at least 10 zone modification iterations, and the like), or randomly chosen at some point in time. The triggering conditions may be predefined or, for example, specified in the zone request parameters.

(72) If the condition is triggered at **270** prizes may be awarded at **280**. If the trigger condition is not satisfied, the process returns to the zone modification step **360**. In the event that an insufficient number of participants remain after a zone reduction, for example, zero participants remain in the current zone, the most recent set of participants may be used. For example, all remaining participants may be awarded the prize. In another example, a random subset of participants may be selected to receive the award.

#### (73) Award Prizes

(74) Prizes may be awarded at **280**. In one embodiment, independent of how the winning participants are determined, the award may be provided to each winning participant. In one embodiment, a notification may be transmitted to either all the participants or just the winning participants. The notification may be transmitted to the gaming devices from a server, such as, for example, zone controller **140**, game server **130**, player tracking server **150**, accounting server **170**, configuration database server **160**, or any other desired server.

(75) The award may include at least the prize won, identifies the winner or list of winners, how to claim the prize, and any other information desired. Optionally, the notification sent to non-winners may include information that they did not win and a suggestion that they try again. In either case, the notification may include an invitation to play another game. The game results may also be reported at **290** to all the participants.

(76) FIG. **3** illustrates an example flow chart for zone configuration. The method **300** may start with retrieving the zone parameters at **310**. The zone parameters may be retrieved from a server or database, such as zone controller **140** illustrated in FIG. **1**. In one embodiment, the zone parameters may be based upon or associated with a zone request. The zone request may include the zone location, the zone area, and the zone shape, as further described and illustrated in FIG. **5**.

(77) The zone geometry may be generated at **320**. The zone geometry may be generated by determining a virtual boundary calculated from the configuration parameters (i.e., focal point and a radius for a circular zone, and the like). The virtual boundary may then be mapped onto a physical area of the casino floor thereby translating the zone area/volume data of the virtual boundary into physical coordinates.

(78) The location of all gaming devices within the zone geometry may be obtained at **320**. The location of the gaming device may be obtained, for example, from zone controller **140** illustrated in FIG. **1**. The physical coordinates of the gaming machines may be obtained. This is feasible since, as discussed above, the physical location of the gaming machine, map of the casino floor, and any other locations, may be stored in a database, such as the location database **120** illustrated in FIG. **1**.

(79) The number of eligible participants may be determined at **340**. Each mobile gaming device associated with a participant within the zone geometry may be considered an eligible participant. Additionally, any gaming machine being played by a player or a player playing at a gaming table may be considered an eligible participant. In one embodiment, the eligibility of a participant may be dependent on the zone request parameters.

(80) A determination of whether there are enough participants may be made at **350**. A minimum or a maximum number of participants may, for example, be one of the parameters included in the zone request. If there is not a sufficient number of eligible participants at **350**, the zone geometry may be re-initialized at **355**. In one embodiment, the zone area may be increased (not enough participants) or may be decreased (too many participants) by a pre-defined amount. In other embodiment, an estimate of the necessary zone size is calculated based on the current number of eligible participants and the minimum number of allowed eligible participants. In yet another embodiment, the re-initialized zone may include a different shape. In another embodiment, the zone request may be cancelled and a new one may be generated. If the number of eligible participants satisfies the configuration limit of eligible participants, the method **300** may continue with saving the state of the game at **360** or step **250** illustrated in FIG. **2**.

#### (81) Monitor Activities



(82) FIG. 4 illustrates an example flow chart for zone modification. The zone-based activity may be initiated at **410** by, for example, the zone controller **140** illustrated in FIG. 1. The positions of the participants, as determined from the mobile and stationary devices, described above, may be monitored. The participant activities may also be monitored at **420**. The activities may include wagering actions, bonus activity, and any other action that may be relevant for determining participant eligibility to play the game.

### (83) Zone Modification

(84) In addition to monitoring player activities at **420**, the zone controller may also track the time the game activity begun. A determination of whether to modify the zone may be made at **430**. The determination of whether to modify the zone may be made periodically or at predetermined period of time after the game activity began. In one embodiment, the determination of whether to modify the zone may be predefined in the zone request. If such time has not occurred, the participants' positions and activities continue to be monitored at **420**. However, if it is determined that it is time to modify the zone at **430**, then the zone modification parameters may be implemented at **440**.

### (85) Implement Zone Modification Parameter

(86) Although discussed in detail with reference to FIG. 5, the zone may be modified by either being decreased or increased, thereby decreasing or increasing the number of eligible participants, respectively. In some zone activity, it may be desirable to decrease the zone and thereby decreasing the number of participants to heighten the excitement for the remaining players. Yet, in another implementation, it may be desirable to increase the zone to include more and more players in a viral fashion, inducing excitement throughout the entire floor. In this case, the initial players who were included in the zone activity gains additional advantage of being able to enjoy the zone privilege for a longer amount of time compared to latter induced members.

### (87) Notification

(88) Participants may be notified of their status at **450**. In one embodiment, all participants that were eligible before the zone modification are transmitted a notification notifying them of their current eligibility. In another embodiment, only currently eligible participants are transmitted a notification. The notification may be transmitted to the players through any known methods, such as a text message to the mobile gaming device, a flashing and/or colored indicator at the gaming device, pop-up message at the gaming device, or any other notification means. For example, a flashing green indicator on the gaming device's screen may indicate that a participant is still eligible to play the game while a steady red indicator may indicate that a participant is no longer eligible. Audible tones, sound effects or even music clips may also be used to indicate status. Various combinations of notifications may be possible. In one embodiment, the participant may be given the option to select how they would like to receive the notification.

### (89) End of Zone Activity

(90) A determination of whether an ending trigger has been detected may be made at **460**. A trigger condition may be time-based (i.e., the zone-based event expires after five (5) minutes, and the like), event-based (i.e., terminate the zone-based activity when a player hits a jackpot, when there is less than three (3) remaining players after a zone reduction, when there is more than 100 players after a zone expansion, when there is at least 10 zone modification iterations, and the like), or randomly chosen condition at some arbitrary point in time. If an ending trigger has been detected at **460**, the participants may be notified of the winners and prizes at **470**. If the ending trigger is not detected at **460**, the method **400** may continue to monitor and save player activities at **420**.

### (91) Zone Modification Examples

(92) FIGS. 5A-5D illustrate example zone configurations and zone reductions. FIG. 5a illustrates an example circular zone. The circular zone is denoted by solid line **502**. It has radius R and is centered around gaming device **504**, which is also the focus. As mentioned previously, the focus is not restricted to a gaming device but can be selected to be any point on the casino floor. Located inside the zone **502** are gaming devices **506a-n** and located outside the zone **502** is gaming device

525. In this example, only participants associated with gaming devices located within the zone 502 at the initiation of the game are eligible for an award. In another embodiment, only players outside the zone 502 are eligible for an award. In yet another implementation, only players within a predefined proximity to the zone 502 are eligible to participate in the zone activity.

(93) In one example, as the zone is modified, the circular zone may be decreased. The radius R may be decreased by small segments, as illustrated by letter “x”. This has the effect of sequentially removing annular regions 1, 2, 3, indicated in the figure with dotted lines, from the zone. In one embodiment, the radius may be decreased by any length and need not be the same length. This allows greater variability in the evolution of the zone.

(94) The decrements of the radius may occur at time intervals, regular, irregular, predefined, or based on predefined conditions. As the zone area is reduced, gaming devices may be eliminated from the zone 502, and thus the number of eligible participants is reduced. A trigger condition may interrupt this process at any step, depending on the zone request parameters. Similarly, the order of the removal of the annular regions does not need to proceed from the perimeter of the zone inward. Any order can be chosen, either randomly or predefined.

(95) FIG. 5b illustrates another example circular zone having the focus centered on an arbitrary point on the casino floor. In this implementation, a zone 502 reduction process may take place where the future zone is within the boundary of the current zone 502.

(96) Zone modification is also illustrated by illustrating a decrease the circular zone 502. In this embodiment the zone 502 is decreased by a specified area. The resulting area is then used to create a reduced circular zone, formed entirely within the zone 502. The focus of the reduced zone is different than the focus of the zone illustrated in FIG. 5a. The location of the new focus can be chosen using any method with the restriction that the reduced zone falls entirely within zone 502. With this embodiment, eligible participants may not be able to determine the location of the reduced zone.

(97) FIG. 5c illustrates an example zone consisting of two separate, non-contiguous areas. In this example each zone 510 has a rectangular shape. However, the shape of the zone is not meant to be limiting as any shape may be used. Additionally, the area of each zone 510 may be different.

(98) As illustrated in FIG. 5c, each zone 510 may have quadrilateral sections 512a-n, indicated by dotted lines. To modify the zone 510, each quadrilateral section may be removed sequentially to decrease the zone 510 size. The sections may be removed in any order and/or multiple sections may be removed simultaneously. For example, section 512a may be removed prior to or simultaneously with 512b. Additionally, the time intervals between section removal can be the same or different, based on an ordered sequence, or at random intervals.

(99) FIG. 5d illustrates a random-type of zone 530. In this embodiment, an area around one group of gaming machines was omitted, as indicated by dashed line 534, thereby creating a “holes” in the zone 530. In addition, FIG. 5d illustrates two player stations 532 at a gaming table 545 that is omitted from the zone 530. The ability to create this type of zone is advantageous when, for example, one or more gaming machines are inoperative (e.g., players not betting enough, or not otherwise eligible). Alternatively, if two player stations are unoccupied when the activity begins, the players may not be permitted to participate in the gaming activity.

(100) While embodiments and applications of this invention have been shown and described, it would be apparent to those skilled in the art having the benefit of this disclosure that many more modifications than mentioned above are possible without departing from the inventive concepts herein.

## Claims

1. A zone-based gaming system comprising: a plurality of gaming devices including a first subset of gaming devices in a first zone and second subset of gaming devices outside the first zone; and at

least one server coupled to the plurality of gaming devices, and having at least one controller and memory storing a plurality of configuration parameters and computer programs, which, when executed, cause the at least one controller to at least: receive a signal indicative of a zone request, access the memory for the configuration parameters based on the signal received, configure a second zone based on the configuration parameters retrieved and a random number generated from a random number generator, including identifying any of the first subset of gaming devices in the first zone that is ineligible in the second zone and any of the second subset of gaming devices that is eligible to participate in the second zone based on the configuration parameters retrieved, and activate a zone feature based on the zone request received in the second zone formed with the gaming devices in the first subset of gaming devices that remain eligible and the gaming devices in the second subset of gaming devices that have been identified as eligible.

2. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to select the second zone based on the random number generated.

3. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to select the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone based on the random number generated.

4. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to receive the signal from one of the gaming devices in the first subset of gaming devices in the first zone.

5. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to select the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone with respect to a predetermined coordinate of the second zone.

6. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to change from the first zone to the second zone at a predetermined frequency.

7. The zone-based gaming system of claim 1, wherein the computer programs, when executed, cause the at least one controller to identify the gaming devices in the first subset of gaming devices in the first zone that are ineligible in the second zone and the second subset of gaming devices that are eligible to participate in the second zone based on a predetermined zone size specified by the configuration parameters retrieved.

8. A method for configuring a zone-based gaming activity within a gaming establishment having a plurality of gaming devices including a first subset of gaming devices in a first zone and second subset of gaming devices outside the first zone, and at least one server coupled to the plurality of gaming devices, and having at least one controller and memory storing a plurality of configuration parameters, the method comprising: transmitting, to the at least one server, a signal indicative of a zone request; retrieving the configuration parameters from the memory based on the signal received; identifying the gaming devices in the first subset of gaming devices in the first zone that remain eligible to participate in a second zone and in the second subset of gaming devices that are eligible to participate in the second zone based on the configuration parameters retrieved based on the configuration parameters retrieved and a random number generated from a random number generator; and activating a zone feature based on the zone request received in the second zone formed with the gaming devices in the first subset of gaming devices that remain eligible and the gaming devices in the second subset of gaming devices that have been identified as eligible.

9. The method of claim 8, further comprising selecting the second zone based on the random number generated.

10. The method of claim 8, further comprising selecting the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone based on the random number generated.

11. The method of claim 8, further comprising receiving the signal from one of the gaming devices

in the first subset of gaming devices in the first zone.

12. The method of claim 8, further comprising identifying the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone with respect to a predetermined coordinate of the second zone.

13. The method of claim 8, further comprising changing from the first zone to the second zone at a predetermined frequency.

14. The method of claim 8, further comprising identifying the gaming devices in the first subset of gaming devices in the first zone that remain eligible in the second zone and the second subset of gaming devices that are eligible to participate in the second zone based on a predetermined zone size specified by the configuration parameters retrieved.

15. A non-transitory computer-readable medium comprising configuration parameters and computer programs for conducting a zone-based gaming activity within a gaming establishment that comprises a plurality of gaming devices including a first subset of gaming devices in a first zone and a second subset of gaming devices outside the first zone, and at least one server coupled to the plurality of gaming devices, and at least one controller, and the computer programs, which, when executed, cause the at least one controller to perform the steps of: accessing the non-transitory computer-readable medium for the configuration parameters based on a signal indicative of a zone request; configuring a second zone based on the configuration parameters retrieved and a random number generated from a random number generator, including identifying any of the first subset of gaming devices in the first zone that is ineligible in the second zone and any of the second subset of gaming devices that is eligible to participate in the second zone based on the configuration parameters retrieved; and initiating a zone feature based on the zone request received in the second zone formed with the gaming devices in the first subset of gaming devices that remain eligible and the gaming devices in the second subset of gaming devices that have been identified as eligible.

16. The non-transitory computer-readable medium of claim 15, wherein the computer programs, when executed, cause the at least one controller to perform the step of selecting the second zone based on the random number generated.

17. The non-transitory computer-readable medium of claim 15, wherein the computer programs, when executed, cause the at least one controller to perform the step of selecting the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone based on the random number generated.

18. The non-transitory computer-readable medium of claim 15, wherein the computer programs, when executed, cause the at least one controller to perform the step of selecting the gaming devices in the second subset of gaming devices that are eligible to participate in the second zone with respect to a predetermined coordinate of the second zone.

19. The non-transitory computer-readable medium of claim 15, wherein the computer programs, when executed, cause the at least one controller to perform the step of changing from the first zone to the second zone at a predetermined frequency.

20. The non-transitory computer-readable medium of claim 15, wherein the computer programs, when executed, cause the at least one controller to perform the step of identifying the gaming devices in the first subset of gaming devices in the first zone that are ineligible in the second zone and the second subset of gaming devices that are eligible to participate in the second zone based on a predetermined zone size specified by the configuration parameters retrieved.

---