

Related U.S. Application Data

continuation of application No. 12/554,906, filed on
Sep. 5, 2009, now Pat. No. 8,996,162.

(51) Int. Cl.

G06Q 10/00 (2012.01)
G06F 17/30 (2006.01)
G06Q 20/00 (2012.01)
G06Q 20/20 (2012.01)
G06Q 10/08 (2012.01)
G06Q 30/06 (2012.01)
G06Q 20/18 (2012.01)
G06Q 20/40 (2012.01)
G06Q 30/02 (2012.01)
G07F 11/54 (2006.01)

(52) U.S. Cl.

CPC **G06Q 20/407** (2013.01); **G06Q 30/0237**
(2013.01); **G06Q 30/0645** (2013.01); **G07F**
11/54 (2013.01)

(58) Field of Classification Search

USPC 700/231, 232, 236, 237, 241
See application file for complete search history.

(56) References Cited**U.S. PATENT DOCUMENTS**

2,549,624 A	4/1951	Moore, Jr.	4,767,917 A	8/1988	Ushikubo
2,559,599 A	7/1951	Crump et al.	4,775,935 A	10/1988	Yourick
2,562,293 A	7/1951	Bourquin	4,778,983 A	10/1988	Ushikubo
3,267,436 A	8/1966	Alpert et al.	4,789,045 A	12/1988	Pugh
3,379,295 A	4/1968	Varley	4,789,054 A	12/1988	Shore et al.
3,404,764 A	10/1968	Lipp et al.	4,797,818 A	1/1989	Cotter
3,529,155 A	9/1970	Hansen	4,812,629 A	3/1989	O'Niel et al.
3,622,995 A	11/1971	Dilks et al.	4,812,985 A	3/1989	Hambrick et al.
3,648,241 A	3/1972	Naito et al.	4,814,592 A	3/1989	Bradt et al.
3,824,544 A	7/1974	Simijian	4,814,985 A	3/1989	Swistak
3,826,344 A	7/1974	Wahlberg	4,821,629 A	4/1989	Davison et al.
3,831,807 A	8/1974	Deaton et al.	4,821,917 A	4/1989	Brown
3,946,220 A	3/1976	Brobeck et al.	4,825,045 A	4/1989	Humble
3,964,577 A	6/1976	Bengtsson	4,839,505 A	6/1989	Bradt et al.
4,043,483 A	8/1977	Gore et al.	4,839,507 A	6/1989	May
4,073,368 A	2/1978	Mustapick	4,847,764 A	7/1989	Halvorson
4,300,040 A	11/1981	Gould et al.	4,858,743 A	8/1989	Paraskevatos et al.
4,306,219 A	12/1981	Main et al.	4,860,876 A	8/1989	Moore et al.
4,348,551 A	9/1982	Nakatani et al.	4,866,661 A	9/1989	Prins
4,369,422 A	1/1983	Rasmussen et al.	4,875,598 A	10/1989	Dahl
4,369,442 A	1/1983	Werth et al.	4,882,475 A	11/1989	Miller et al.
4,385,366 A	5/1983	Housey, Jr.	4,893,705 A	1/1990	Brown
4,388,689 A	6/1983	Hayman et al.	4,893,727 A	1/1990	Near
4,396,985 A	8/1983	Ohara	4,896,024 A	1/1990	Morello et al.
4,414,467 A	11/1983	Gould et al.	4,903,815 A	2/1990	Hirschfeld et al.
4,415,065 A	11/1983	Sandstedt	4,915,205 A	4/1990	Reid et al.
4,449,186 A	5/1984	Kelly et al.	D308,052 S	5/1990	Darden et al.
4,458,802 A	7/1984	Maciver et al.	4,921,128 A	5/1990	Guigan et al.
4,519,522 A	5/1985	McElwee	4,941,841 A	7/1990	Darden et al.
4,530,067 A	7/1985	Dorr	4,945,428 A	7/1990	Waldo
4,547,851 A	10/1985	Kurland	4,947,028 A	8/1990	Gorog
4,553,222 A	11/1985	Kurland et al.	4,959,686 A	9/1990	Spallone et al.
4,567,359 A	1/1986	Lockwood	4,967,403 A	10/1990	Ogawa et al.
4,569,421 A	2/1986	Sandstedt	4,967,906 A	11/1990	Morello et al.
RE32,115 E	4/1986	Lockwood et al.	4,982,346 A	1/1991	Girouard et al.
4,598,810 A	7/1986	Shore et al.	4,991,739 A	2/1991	Levasseur
4,649,481 A	3/1987	Takahashi	4,995,498 A	2/1991	Menke
4,650,977 A	3/1987	Couch	5,007,518 A	4/1991	Crooks et al.
4,668,150 A	5/1987	Blumberg	5,012,077 A	4/1991	Takano
4,669,596 A	6/1987	Capers et al.	5,013,897 A	5/1991	Harman et al.
4,675,515 A	6/1987	Lucero	5,019,699 A	5/1991	Koenck
4,706,794 A	11/1987	Awane et al.	5,020,958 A	6/1991	Tuttobene
4,722,053 A	1/1988	Dubno et al.	5,028,766 A	7/1991	Shah
4,723,212 A	2/1988	Mindrum et al.	5,042,686 A	8/1991	Stucki
4,734,005 A	3/1988	Blumberg	5,077,462 A	12/1991	Newell et al.
4,766,548 A	8/1988	Cedrone et al.	5,077,607 A	12/1991	Johnson et al.
			5,085,308 A	2/1992	Wilhelm
			5,088,586 A	2/1992	Isobe et al.
			5,091,713 A	2/1992	Horne et al.
			5,095,195 A	3/1992	Harman et al.
			5,105,069 A	4/1992	Hakenewerth et al.
			5,128,862 A	7/1992	Mueller
			5,133,441 A	7/1992	Brown
			5,139,384 A	8/1992	Tuttobene
			5,143,193 A	9/1992	Geraci
			5,159,560 A	10/1992	Newell et al.
			5,205,436 A	4/1993	Savage
			5,206,814 A	4/1993	Cahlander et al.
			5,207,784 A	5/1993	Schwartzendruber
			5,212,649 A	5/1993	Pelletier et al.
			5,226,519 A	7/1993	DeWoolfson
			5,235,509 A	8/1993	Mueller et al.
			RE34,369 E	9/1993	Darden et al.
			5,273,183 A	12/1993	Tuttobene
			5,313,392 A	5/1994	Temma et al.
			5,313,393 A	5/1994	Varley et al.
			5,319,705 A	6/1994	Halter et al.
			5,323,327 A	6/1994	Carmichael et al.
			5,353,219 A	10/1994	Mueller et al.
			5,383,111 A	1/1995	Homma et al.
			5,385,265 A	1/1995	Schlamp
			5,402,911 A	4/1995	Noelle
			5,408,417 A	4/1995	Wilder
			5,409,092 A	4/1995	Itako et al.
			5,418,713 A	5/1995	Allen
			5,442,568 A	8/1995	Ostendorf et al.
			5,445,295 A	8/1995	Brown
			5,450,584 A	9/1995	Sekiguchi et al.
			5,450,938 A	9/1995	Rademacher

(56)

References Cited

U.S. PATENT DOCUMENTS

5,467,892 A	11/1995	Schlamp	6,029,851 A	2/2000	Jenkins et al.
5,482,139 A	1/1996	Rivalto	6,039,244 A	3/2000	Finsterwald
5,484,988 A	1/1996	Hills et al.	6,044,362 A	3/2000	Neely
5,499,707 A	3/1996	Steury	6,047,338 A	4/2000	Grolemund
5,504,675 A	4/1996	Cragun et al.	6,050,448 A	4/2000	Willis
5,510,979 A	4/1996	Moderi et al.	6,056,150 A	5/2000	Kasper
5,513,116 A	4/1996	Buckley et al.	6,056,194 A	5/2000	Kolls
5,546,316 A	8/1996	Buckley et al.	6,058,373 A	5/2000	Blinn et al.
5,550,746 A	8/1996	Jacobs	6,061,660 A	5/2000	Eggleston et al.
5,555,143 A	9/1996	Hinnen et al.	6,062,478 A	5/2000	Izaguirre et al.
5,559,714 A	9/1996	Banks et al.	6,072,481 A	6/2000	Matsushita et al.
5,559,887 A	9/1996	Davis et al.	6,076,101 A	6/2000	Kamakura et al.
5,561,604 A	10/1996	Buckley et al.	6,078,848 A	6/2000	Bernstein et al.
5,576,951 A	11/1996	Lockwood	6,085,888 A	7/2000	Tedesco et al.
5,594,791 A	1/1997	Szlam et al.	6,101,483 A	8/2000	Petrovich et al.
5,608,643 A	3/1997	Wichter et al.	6,109,524 A	8/2000	Kanoh et al.
5,615,123 A	3/1997	Davidson et al.	6,115,649 A	9/2000	Sakata
5,632,681 A	5/1997	Bakoglu et al.	6,119,934 A	9/2000	Kolls
5,633,839 A	5/1997	Alexander et al.	6,123,223 A	9/2000	Watkins
5,637,845 A	6/1997	Kolls	6,125,353 A	9/2000	Yagasaki
5,638,985 A	6/1997	Fitzgerald et al.	6,126,036 A	10/2000	D'Alayer De Costemore D'Arc et al.
5,644,727 A	7/1997	Atkins	6,134,547 A	10/2000	Huxley et al.
5,647,505 A	7/1997	Scott	6,138,911 A	10/2000	Fredregill et al.
5,647,507 A	7/1997	Kasper	6,161,059 A	12/2000	Tedesco et al.
5,682,276 A	10/1997	Hinnen et al.	6,164,528 A	12/2000	Hills et al.
5,694,546 A	12/1997	Reisman	6,169,483 B1	1/2001	Ghaffari et al.
5,699,262 A	12/1997	Lang et al.	6,179,206 B1	1/2001	Matsumori
5,699,528 A	12/1997	Hogan	6,181,981 B1	1/2001	Varga et al.
5,715,403 A	2/1998	Stefik et al.	6,182,857 B1	2/2001	Hamm et al.
5,724,069 A	3/1998	Chen	6,195,661 B1	2/2001	Filepp et al.
5,724,521 A	3/1998	Dedrick	6,199,141 B1	3/2001	Weinreb et al.
5,732,398 A	3/1998	Tagawa	6,199,720 B1	3/2001	Rudick et al.
5,734,150 A	3/1998	Brown et al.	6,201,474 B1	3/2001	Brady et al.
5,748,485 A	5/1998	Christiansen et al.	6,202,006 B1	3/2001	Scott
5,754,850 A	5/1998	Janssen	6,209,322 B1	4/2001	Yoshida et al.
5,761,071 A	6/1998	Bernstein et al.	6,243,687 B1	6/2001	Powell
5,765,142 A	6/1998	Allred et al.	6,250,452 B1	6/2001	Partyka et al.
5,768,142 A	6/1998	Jacobs	6,264,104 B1	7/2001	Jenkins et al.
5,769,269 A	6/1998	Peters	6,269,285 B1	7/2001	Mignault
5,777,884 A	7/1998	Belka et al.	6,286,139 B1	9/2001	Decinque
H1743 H	8/1998	Graves et al.	6,289,322 B1	9/2001	Kitchen et al.
5,790,677 A	8/1998	Fox et al.	6,295,482 B1	9/2001	Tognazzini
5,806,071 A	9/1998	Balderrama et al.	6,298,972 B1	10/2001	Tedesco et al.
5,822,216 A	10/1998	Satchell, Jr. et al.	6,311,165 B1	10/2001	Coutts et al.
5,822,291 A	10/1998	Brindze et al.	6,317,649 B1	11/2001	Tedesco et al.
5,831,862 A	11/1998	Hetrick et al.	6,321,985 B1	11/2001	Kolls
5,832,503 A	11/1998	Malik et al.	6,324,520 B1	11/2001	Walker et al.
5,850,442 A	12/1998	Muftic	6,327,230 B1	12/2001	Miller et al.
5,870,716 A	2/1999	Sugiyama et al.	6,330,958 B1	12/2001	Ruskin et al.
5,873,069 A	2/1999	Reuhl et al.	6,334,110 B1	12/2001	Walter et al.
5,875,110 A	2/1999	Jacobs	6,336,098 B1	1/2002	Fortenberry et al.
5,884,278 A	3/1999	Powell	6,354,501 B1	3/2002	Outwater et al.
5,898,594 A	4/1999	Leason et al.	6,360,139 B1	3/2002	Jacobs
5,900,608 A	5/1999	Iida	6,366,914 B1	4/2002	Stern
5,905,246 A	5/1999	Fajkowski	6,367,653 B1	4/2002	Ruskin et al.
5,923,016 A	7/1999	Fredregill et al.	6,367,696 B1	4/2002	Inamitsu et al.
5,930,771 A	7/1999	Stapp	6,397,126 B1	5/2002	Nelson
5,934,439 A	8/1999	Kanoh et al.	6,397,199 B1	5/2002	Goodwin, III
5,936,452 A	8/1999	Utsuno et al.	6,412,654 B1	7/2002	Cleeve
5,938,510 A	8/1999	Takahashi et al.	6,415,555 B1	7/2002	Montague
5,941,363 A	8/1999	Partyka et al.	6,415,950 B1	7/2002	Robrechts
5,943,423 A	8/1999	Muftic	6,416,270 B1	7/2002	Steury et al.
5,950,173 A	9/1999	Perkowski	6,424,706 B1	7/2002	Katz et al.
5,954,797 A	9/1999	Sidey	6,430,470 B1	8/2002	Nakajima et al.
5,956,694 A	9/1999	Powell	6,435,406 B1	8/2002	Pentel
5,959,869 A	9/1999	Miller et al.	6,438,447 B1	8/2002	Belka et al.
5,963,134 A	10/1999	Bowers et al.	6,456,981 B1	9/2002	Dejaeger et al.
5,963,452 A	10/1999	Etoh et al.	6,457,038 B1	9/2002	Defosse
5,984,509 A	11/1999	Scott	6,462,644 B1	10/2002	Howell et al.
5,988,346 A	11/1999	Tedesco et al.	6,466,658 B2	10/2002	Schelberg, Jr. et al.
5,988,431 A	11/1999	Roe	6,466,830 B1	10/2002	Manross et al.
5,997,170 A	12/1999	Brodbeck	6,477,503 B1	11/2002	Mankes
6,002,395 A	12/1999	Wagner et al.	6,490,502 B2	12/2002	Fellows et al.
6,010,239 A	1/2000	Hardgrave et al.	6,493,110 B1	12/2002	Roberts
6,014,137 A	1/2000	Burns	6,505,095 B1	1/2003	Kolls
			6,522,772 B1	2/2003	Morrison et al.
			6,527,176 B2	3/2003	Baric
			6,539,282 B2	3/2003	Metcalf et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

6,540,100 B2	4/2003	Credle, Jr. et al.	7,310,612 B2	12/2007	McQueen, III et al.
6,575,363 B1	6/2003	Leason et al.	7,315,629 B2	1/2008	Alasia et al.
6,584,309 B1	6/2003	Whigham	7,347,359 B2	3/2008	Boyes et al.
6,584,450 B1	6/2003	Hastings et al.	7,350,230 B2	3/2008	Forrest
6,584,564 B2	6/2003	Olkin et al.	7,366,586 B2	4/2008	Kaplan et al.
6,587,748 B2	7/2003	Baack	7,389,243 B2	6/2008	Gross
6,587,835 B1	7/2003	Treyz et al.	7,406,693 B1	7/2008	Goodwin, III
6,595,342 B1	7/2003	Maritzen et al.	7,412,073 B2	8/2008	Alasia et al.
6,606,602 B1	8/2003	Kolls	7,444,296 B1	10/2008	Barber et al.
6,628,764 B1	9/2003	Petite	7,447,605 B2	11/2008	Kuehnrich
6,640,159 B2	10/2003	Holmes et al.	7,499,768 B2	3/2009	Hoersten et al.
6,644,455 B2	11/2003	Ichikawa	7,584,869 B2	9/2009	DeLazzer et al.
6,644,495 B2	11/2003	Ruskin et al.	7,747,346 B2	6/2010	Lowe et al.
6,655,580 B1	12/2003	Ergo et al.	RE41,543 E	8/2010	Satchell, Jr. et al.
6,658,323 B2	12/2003	Tedesco et al.	7,774,233 B2	8/2010	Barber et al.
6,675,067 B2	1/2004	Blad	7,787,987 B2	8/2010	Kuehnrich et al.
6,688,523 B1	2/2004	Koenck	7,797,077 B2	9/2010	Hale
6,696,918 B2	2/2004	Kucharczyk et al.	7,797,164 B2	9/2010	Junger et al.
6,707,380 B2	3/2004	Maloney	7,853,354 B2	12/2010	Kuehnrich et al.
6,707,381 B1	3/2004	Maloney	7,853,600 B2	12/2010	Herz et al.
6,708,879 B2	3/2004	Hunt	7,860,606 B2	12/2010	Rudy
6,711,464 B1	3/2004	Yap et al.	7,925,973 B2	4/2011	Allaire et al.
6,711,465 B2	3/2004	Tomassi	7,988,049 B2	8/2011	Kuehnrich
6,715,403 B2	4/2004	Hajek, Jr. et al.	8,036,774 B2	10/2011	Blust et al.
6,728,532 B1	4/2004	Ahonen	8,041,454 B2	10/2011	Blust et al.
6,742,673 B2	6/2004	Credle, Jr. et al.	8,060,249 B2	11/2011	Bear et al.
6,748,296 B2	6/2004	Banerjee et al.	8,078,316 B2	12/2011	Blust et al.
6,748,539 B1	6/2004	Lotspiech	8,086,349 B2	12/2011	Blust et al.
6,754,559 B2	6/2004	Itako	8,234,207 B2	7/2012	Breitenbach et al.
6,757,585 B2	6/2004	Ohtsuki et al.	8,235,247 B2	8/2012	Alvarez
6,792,334 B2	9/2004	Metcalf et al.	8,306,908 B1	11/2012	Barker et al.
6,794,634 B2	9/2004	Hair, III et al.	8,352,449 B1	1/2013	Parekh et al.
6,814,256 B2	11/2004	Clark	8,386,347 B2	2/2013	Hoblit
6,847,861 B2	1/2005	Lunak et al.	8,412,374 B2	4/2013	Kuehnrich et al.
6,850,816 B2	2/2005	Garratt	8,417,380 B2	4/2013	Kuehnrich et al.
6,851,092 B2	2/2005	Chang et al.	8,463,432 B2	6/2013	Weinschenker
6,854,642 B2	2/2005	Metcalf et al.	8,510,171 B2	8/2013	Pederson et al.
6,923,371 B2	8/2005	Goodfellow	8,752,093 B2	6/2014	White et al.
6,932,270 B1	8/2005	Fajkowski	8,996,162 B2 *	3/2015	Lowe G06Q 10/06 700/232
6,954,732 B1	10/2005	DeLapa et al.	9,489,691 B2 *	11/2016	Lowe G06Q 10/06
6,959,285 B2	10/2005	Stefanik et al.	9,542,661 B2 *	1/2017	Lowe G06Q 10/06
6,959,286 B2	10/2005	Perkowski	2001/0011252 A1	8/2001	Kasahara
6,965,869 B1	11/2005	Tomita et al.	2001/0011680 A1	8/2001	Soltész et al.
6,968,365 B2	11/2005	Hollstrom et al.	2001/0027357 A1	10/2001	Grobler
6,970,837 B1	11/2005	Walker et al.	2001/0035425 A1	11/2001	Rocco et al.
6,980,887 B2	12/2005	Varga et al.	2001/0037207 A1	11/2001	Dejaeger
6,985,607 B2	1/2006	Alasia et al.	2001/0047223 A1	11/2001	Metcalf et al.
7,024,381 B1	4/2006	Hastings et al.	2002/0029196 A1	3/2002	Metcalf et al.
7,024,390 B1	4/2006	Mori et al.	2002/0046122 A1	4/2002	Barber et al.
7,043,497 B1	5/2006	Carty et al.	2002/0046123 A1	4/2002	Nicolini
7,053,773 B2	5/2006	McGarry et al.	2002/0065579 A1	5/2002	Tedesco et al.
7,058,581 B1	6/2006	Young	2002/0074397 A1	6/2002	Matthews
7,076,328 B2	7/2006	Piikivi	2002/0082917 A1	6/2002	Takano
7,076,329 B1	7/2006	Kolls	2002/0084322 A1	7/2002	Baric
7,079,230 B1	7/2006	McInerney et al.	2002/0087334 A1	7/2002	Yamaguchi et al.
7,079,822 B2	7/2006	Gunji et al.	2002/0095680 A1	7/2002	Davidson
7,079,922 B2	7/2006	Komai	2002/0125314 A1	9/2002	Jenkins et al.
7,085,556 B2	8/2006	Offer	2002/0133269 A1	9/2002	Anselmi
7,085,727 B2	8/2006	VanOrman	2002/0161475 A1	10/2002	Varga et al.
7,101,139 B1	9/2006	Benedict	2002/0165787 A1	11/2002	Bates et al.
7,108,180 B2	9/2006	Brusso et al.	2002/0165788 A1	11/2002	Bates et al.
7,139,731 B1	11/2006	Alvin	2002/0165821 A1	11/2002	Tree
7,167,842 B1	1/2007	Josephson, II et al.	2002/0169715 A1	11/2002	Ruth et al.
7,167,892 B2	1/2007	Defosse et al.	2002/0183882 A1	12/2002	Dearing et al.
7,174,317 B2	2/2007	Phillips et al.	2002/0195491 A1	12/2002	Bunch, III
7,191,952 B2	3/2007	Blossom	2003/0004828 A1	1/2003	Epstein
7,203,675 B1	4/2007	Papierniak et al.	2003/0009408 A1	1/2003	Korin
7,209,893 B2	4/2007	Nii	2003/0023453 A1	1/2003	Hafen et al.
7,213,753 B2	5/2007	Barton et al.	2003/0030539 A1	2/2003	McGarry et al.
7,233,916 B2	6/2007	Schultz	2003/0033054 A1	2/2003	Yamazaki
7,234,609 B2	6/2007	DeLazzer et al.	2003/0057219 A1	3/2003	Risolio
7,236,942 B1	6/2007	Walker et al.	2003/0061094 A1	3/2003	Banerjee et al.
7,236,946 B2	6/2007	Bates et al.	2003/0105554 A1	6/2003	Eggenberger et al.
7,240,805 B2	7/2007	Chirnomas	2003/0125961 A1	7/2003	Janda
7,240,843 B2	7/2007	Paul et al.	2003/0130762 A1	7/2003	Tomassi
			2003/0149510 A1	8/2003	Takahashi
			2003/0154141 A1	8/2003	Capazario et al.
			2003/0163382 A1	8/2003	Stefanik et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

2003/0163399	A1	8/2003	Harper et al.	2006/0231614	A1	10/2006	Walker et al.
2003/0167231	A1	9/2003	Winking et al.	2006/0235746	A1	10/2006	Hammond et al.
2003/0204289	A1	10/2003	Banerjee et al.	2006/0235747	A1	10/2006	Hammond et al.
2003/0212471	A1	11/2003	Chakravarti	2006/0241966	A1	10/2006	Walker et al.
2004/0006537	A1	1/2004	Zelechowski et al.	2006/0241967	A1	10/2006	Gross
2004/0010340	A1	1/2004	Guindulain Vidondo	2006/0242059	A1	10/2006	Hansen
2004/0016620	A1	1/2004	Davis	2006/0247823	A1	11/2006	Boucher
2004/0030446	A1	2/2004	Guindulain Vidondo	2006/0247824	A1	11/2006	Walker et al.
2004/0050648	A1	3/2004	Carapelli	2006/0254832	A1	11/2006	Strong
2004/0064347	A1	4/2004	VanOrman	2006/0254862	A1	11/2006	Hoersten
2004/0064377	A1	4/2004	Ergo et al.	2006/0259191	A1	11/2006	Lowe
2004/0065579	A1	4/2004	Wood	2006/0259192	A1*	11/2006	Lowe G06Q 10/06311 700/236
2004/0068346	A1	4/2004	Boucher	2006/0265286	A1	11/2006	Evangelist et al.
2004/0068451	A1	4/2004	Lenk et al.	2006/0266823	A1	11/2006	Passen et al.
2004/0078328	A1	4/2004	Talbert et al.	2006/0273152	A1	12/2006	Fields
2004/0079798	A1	4/2004	Messenger et al.	2007/0005438	A1	1/2007	Evangelist et al.
2004/0133466	A1	7/2004	Redmond et al.	2007/0011093	A1	1/2007	Tree
2004/0133653	A1	7/2004	Defosse et al.	2007/0011903	A1	1/2007	Chang
2004/0153413	A1	8/2004	Gross	2007/0050083	A1	3/2007	Signorelli et al.
2004/0158503	A1	8/2004	Gross	2007/0050256	A1	3/2007	Walker et al.
2004/0158504	A1	8/2004	Gross	2007/0050266	A1	3/2007	Barber et al.
2004/0158871	A1	8/2004	Jacobson	2007/0051802	A1	3/2007	Barber et al.
2004/0162633	A1	8/2004	Kraft et al.	2007/0063020	A1	3/2007	Barrafato
2004/0162783	A1	8/2004	Gross	2007/0063027	A1	3/2007	Belfer et al.
2004/0172274	A1	9/2004	Gross	2007/0067429	A1	3/2007	Jain et al.
2004/0172275	A1	9/2004	Gross	2007/0084872	A1	4/2007	Hair, III et al.
2004/0172342	A1	9/2004	Gross	2007/0084917	A1	4/2007	Fajkowski
2004/0186783	A1	9/2004	Knight et al.	2007/0094245	A1	4/2007	Vigil
2004/0243479	A1	12/2004	Gross	2007/0095901	A1	5/2007	Illingworth
2004/0243480	A1	12/2004	Gross	2007/0125104	A1	6/2007	Ehlers
2004/0249711	A1	12/2004	Walker et al.	2007/0130020	A1	6/2007	Paolini
2004/0254676	A1	12/2004	Blust et al.	2007/0136247	A1	6/2007	Vigil
2004/0256402	A1	12/2004	Chirnomas	2007/0156442	A1	7/2007	Ali
2004/0260600	A1	12/2004	Gross	2007/0156578	A1	7/2007	Perazolo
2004/0267604	A1	12/2004	Gross	2007/0162183	A1	7/2007	Pinney et al.
2004/0267640	A1	12/2004	Bong et al.	2007/0162184	A1	7/2007	Pinney et al.
2005/0022239	A1	1/2005	Meuleman	2007/0169132	A1	7/2007	Blust et al.
2005/0027648	A1	2/2005	Knowles et al.	2007/0175986	A1	8/2007	Petrone et al.
2005/0033855	A1	2/2005	Moradi et al.	2007/0179668	A1	8/2007	Mellin
2005/0060062	A1	3/2005	Walker et al.	2007/0185776	A1	8/2007	Nguyen et al.
2005/0060246	A1	3/2005	Lastinger et al.	2007/0210153	A1	9/2007	Walker et al.
2005/0080510	A1	4/2005	Bates et al.	2007/0213871	A1	9/2007	Whitten et al.
2005/0085946	A1	4/2005	Visikivi et al.	2007/0252003	A1	11/2007	Goldring et al.
2005/0086127	A1	4/2005	Hastings et al.	2007/0276537	A1	11/2007	Walker et al.
2005/0091069	A1	4/2005	Chuang	2007/0299737	A1	12/2007	Plastina et al.
2005/0096936	A1	5/2005	Lambers	2008/0005025	A1	1/2008	Legere et al.
2005/0109836	A1	5/2005	Ben-Aissa	2008/0027835	A1	1/2008	LeMasters et al.
2005/0177494	A1	8/2005	Kelly et al.	2008/0040211	A1	2/2008	Walker et al.
2005/0197855	A1	9/2005	Nudd et al.	2008/0097770	A1	4/2008	Low et al.
2005/0216120	A1	9/2005	Rosenberg et al.	2008/0116262	A1	5/2008	Majer
2005/0230410	A1	10/2005	DeLazzer et al.	2008/0125906	A1	5/2008	Bates et al.
2005/0230473	A1	10/2005	Fajkowski	2008/0131255	A1	6/2008	Hessler et al.
2005/0234911	A1	10/2005	Hess et al.	2008/0222690	A1	9/2008	Kim
2005/0261977	A1	11/2005	Kiji et al.	2008/0239961	A1	10/2008	Hilerio et al.
2005/0267819	A1	12/2005	Kaplan	2008/0249658	A1	10/2008	Walker et al.
2005/0274793	A1	12/2005	Cantini et al.	2008/0275591	A1	11/2008	Chirnomas
2005/0283434	A1	12/2005	Hahn-Carlson et al.	2008/0313973	A1	12/2008	Butler
2005/0289032	A1	12/2005	Hoblit	2009/0030931	A1	1/2009	Khivesara et al.
2006/0026031	A1	2/2006	Gentling	2009/0048932	A1	2/2009	Barber
2006/0026162	A1	2/2006	Salmonsens	2009/0089187	A1	4/2009	Hoersten et al.
2006/0041508	A1	2/2006	Pham et al.	2009/0113116	A1	4/2009	Thompson et al.
2006/0045660	A1	3/2006	Di Rosa	2009/0139886	A1	6/2009	Blust et al.
2006/0074777	A1	4/2006	Anderson	2009/0299824	A1	12/2009	Barnes, Jr.
2006/0095286	A1	5/2006	Kimura	2009/0326708	A1	12/2009	Rudy et al.
2006/0095339	A1	5/2006	Hayashi et al.	2010/0010964	A1	1/2010	Skowronek et al.
2006/0096997	A1	5/2006	Yeo	2010/0036808	A1	2/2010	Lee
2006/0122881	A1	6/2006	Walker et al.	2010/0042577	A1	2/2010	Rinearson
2006/0149685	A1	7/2006	Gross	2010/0057871	A1	3/2010	Kaplan et al.
2006/0155575	A1	7/2006	Gross	2010/0127013	A1	5/2010	Butler
2006/0184395	A1	8/2006	Millwee	2010/0138037	A1	6/2010	Adelberg et al.
2006/0190345	A1	8/2006	Crowley	2010/0153983	A1	6/2010	Philmon et al.
2006/0212360	A1	9/2006	Stefanik et al.	2010/0198400	A1	8/2010	Pascal et al.
2006/0212367	A1	9/2006	Gross	2010/0211217	A1	8/2010	Hirsh et al.
2006/0231612	A1	10/2006	Walker et al.	2010/0274624	A1	10/2010	Rochford et al.
2006/0231613	A1	10/2006	Walker et al.	2010/0296908	A1	11/2010	Ko
				2010/0312380	A1	12/2010	Lowe et al.
				2010/0314405	A1	12/2010	Alvarez
				2010/0316468	A1	12/2010	Lert et al.

(56)

References Cited**U.S. PATENT DOCUMENTS**

2011/0004536 A1 1/2011 Hoersten et al.
 2011/0047010 A1 2/2011 Arnold et al.
 2011/0060454 A1 3/2011 Lowe et al.
 2011/0060456 A1 3/2011 Lowe et al.
 2011/0093329 A1 4/2011 Bodor et al.
 2011/0103609 A1 5/2011 Pelland et al.
 2011/0130873 A1 6/2011 Yepez et al.
 2011/0131652 A1 6/2011 Robinson et al.
 2011/0153060 A1 6/2011 Yepez et al.
 2011/0153067 A1 6/2011 Weinshenker
 2011/0153071 A1 6/2011 Claessen
 2011/0238194 A1 9/2011 Rosenberg
 2011/0238296 A1 9/2011 Purks et al.
 2012/0046786 A1 2/2012 Kuehnrich et al.
 2012/0059511 A1 3/2012 Majer
 2012/0123587 A1 5/2012 Mockus et al.
 2012/0310409 A1 12/2012 Breitenbach et al.
 2012/0311633 A1 12/2012 Mandrekar et al.
 2012/0330458 A1 12/2012 Weiss
 2013/0046707 A1 2/2013 Maskatia et al.
 2013/0060648 A1 3/2013 Maskatia et al.
 2013/0238115 A1 9/2013 Smith et al.
 2013/0310970 A1 11/2013 Segal et al.
 2014/0052292 A1 2/2014 Lowe

FOREIGN PATENT DOCUMENTS

DE 3529155 A1 2/1987
 EP 0060643 A2 9/1982
 EP 0205691 A1 12/1986
 EP 0247876 A2 12/1987
 EP 0249367 A2 12/1987
 EP 0287367 A1 10/1988
 EP 0572119 A2 12/1993
 EP 0986033 A2 3/2000
 EP 1367549 A1 12/2003
 EP 2113892 A1 11/2009
 EP 1396824 B1 7/2010
 EP 2249367 A1 11/2010
 FR 2549624 A1 1/1985
 FR 2559599 A1 8/1985
 FR 2562293 A1 10/1985
 GB 380926 A 9/1932
 GB 2143662 A 2/1985
 GB 2172720 A 9/1986
 GB 2402242 A 12/2004
 JP S55156107 A 12/1980
 JP S5647855 A 4/1981
 JP H02178795 A 7/1990
 JP H0362189 A 3/1991
 JP H03119496 A 5/1991
 JP H10247982 A 9/1998
 JP 2000149136 A 5/2000
 JP 2003036328 A 2/2003
 JP 2004094857 A 3/2004
 JP 2009043143 A 2/2009
 KR 1019990066053 A 8/1999
 KR 20030089154 A 11/2003
 KR 20040069053 A 8/2004
 KR 20060080175 A 7/2006
 KR 20060114658 A 11/2006
 KR 20070021301 A 2/2007
 WO 8700948 A1 2/1987
 WO 8705425 A1 9/1987
 WO 8804085 A1 6/1988
 WO 8806771 A1 9/1988
 WO 9300644 A1 1/1993
 WO 9404446 A1 3/1994
 WO 9618972 A1 6/1996
 WO 9847799 A1 10/1998
 WO 9924902 A1 5/1999
 WO 0038120 A1 6/2000
 WO 0072160 A1 11/2000
 WO 0225552 A2 3/2002
 WO 0229708 A1 4/2002

WO 2004070646 A2 8/2004
 WO 2005062887 A2 7/2005
 WO 2006112817 A1 10/2006
 WO 2006116108 A2 11/2006
 WO 2006116109 A2 11/2006
 WO 2006116110 A2 11/2006
 WO 2006116112 A1 11/2006
 WO 2006116113 A2 11/2006
 WO 2006116114 A2 11/2006
 WO 2006116115 A2 11/2006
 WO 2006116116 A2 11/2006
 WO 2006130638 A2 12/2006
 WO 2007012816 A1 2/2007
 WO 2009032946 A1 3/2009
 WO 2010048375 A1 4/2010
 WO 2011022689 A2 2/2011
 WO 2011028727 A2 3/2011
 WO 2011028728 A2 3/2011
 WO 2011031532 A2 3/2011

OTHER PUBLICATIONS

European Search Report for Application No. EP11004042, dated Jul. 28, 2011, 2 dated.
 “European Search Report for Application No. EP1280399, dated Aug. 19, 2015, 8 pages”.
 Examination Report for EP 05736275.8, dated May 15, 2009.
 “Examination Report for EP 10814374.4, dated Oct. 8, 2015”.
 “Examination Report for EP 10814375.1, dated Sep. 29, 2015”.
 International Preliminary Report on Patentability for Application No. PCT/US2005/12563, dated Apr. 7, 2006, 3 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15125, dated Jan. 11, 2007, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15126, dated Apr. 3, 2008, 6 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15127, dated Jun. 19, 2008, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15129, dated Sep. 20, 2006, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15130, dated Apr. 23, 2007, 56 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15131, mailed on Jul. 7, 2008, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15132, dated Nov. 16, 2007, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2006/15133, dated Jun. 6, 2007, 4 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2010/046219, dated Feb. 28, 2011, 6 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2010/046872, dated Sep. 7, 2011, 14 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2010/047371, dated Apr. 29, 2011, 7 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2010/047374, dated May 2, 2011, 7 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2010/050339, dated Apr. 12, 2012, 9 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2011/48686, dated Mar. 7, 2013, 6 pages.
 International Preliminary Report on Patentability for Application No. PCT/US2012/024900, dated Aug. 29, 2013, 6 pages.
 International Search Report and Written Opinion for Application No. PCT/US2005/012563, dated Aug. 10, 2005, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015125, dated Jan. 11, 2007, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015126, dated Apr. 3, 2008, 6 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015127, dated Jun. 19, 2008, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015129, dated Sep. 20, 2006, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015130, dated Nov. 22, 2006, 4 pages.

(56)

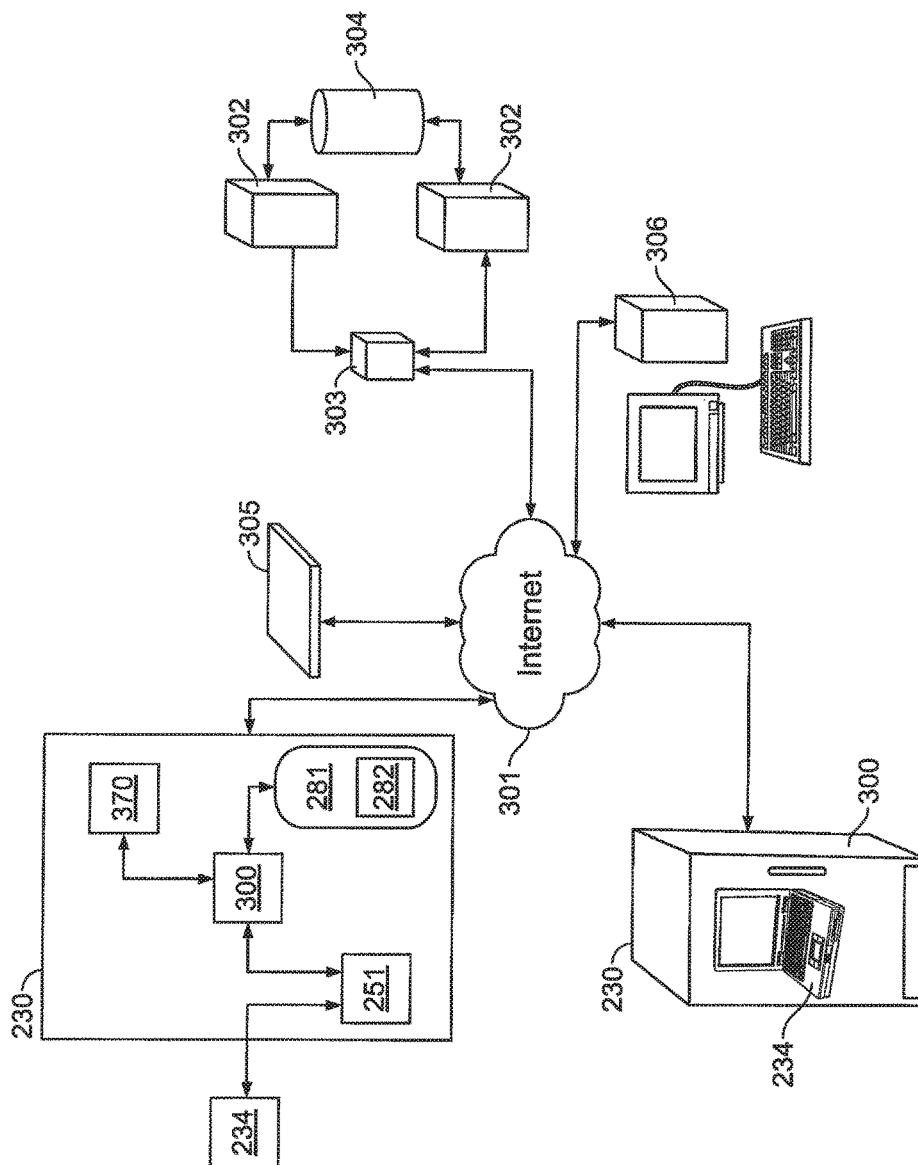
References Cited

OTHER PUBLICATIONS

International Search Report and Written Opinion for Application No. PCT/US2006/015131, dated Jul. 7, 2008, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015132, dated May 10, 2007, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2006/015133, dated Jun. 6, 2007, 4 pages.
 International Search Report and Written Opinion for Application No. PCT/US2010/046219, dated Feb. 28, 2011, 10 pages.
 International Search Report and Written Opinion for Application No. PCT/US2010/046872, dated Mar. 29, 2011, 7 pages.
 International Search Report and Written Opinion for Application No. PCT/US2010/047371, dated Apr. 29, 2011, 9 pages.
 International Search Report and Written Opinion for Application No. PCT/US2010/047374, dated May 2, 2011, 9 pages.
 International Search Report and Written Opinion for Application No. PCT/US2011/048686, dated Apr. 9, 2012, 9 pages.
 International Search Report and Written Opinion for Application No. PCT/US2011/050339, dated Feb. 29, 2012, 8 pages.
 International Search Report and Written Opinion for Application No. PCT/US2012/024900, dated Oct. 19, 2012, 8 pages.
 International Search Report and Written Opinion for Application No. PCT/US2012/042329, dated Feb. 22, 2013, 28 pages.
 International Search Report and Written Opinion for Application No. PCT/US2013/029414, dated Jun. 26, 2013, 7 pages.
 International Search Report and Written Opinion for Application No. PCT/US2013/029424, dated Jun. 21, 2013, 9 pages.
 International Search Report and Written Opinion for Application No. PCT/US2013/029443, dated Jun. 21, 2013, 13 pages.
 International Search Report for Application No. PCT/US06/015129, dated Sep. 20, 2006, 1 page.
 International Search Report for Application No. PCT/US06/15130, dated Nov. 22, 2006, 1 page.
 International Search Report for Application No. PCT/US06/15132, dated May 10, 2007, 1 page.
 International Search Report for Application No. PCT/US06/15133, dated Jun. 6, 2007, 1 page.

International Search Report for Application No. PCT/US2006/15125, dated Jan. 11, 2007, 1 page.
 International Search Report for Application No. PCT/US2006/15126, dated Apr. 3, 2008, 1 page.
 International Search Report for Application No. PCT/US2010/047371 dated Apr. 29, 2011, 3 pages.
 International Search Report for Application No. PCT/US2010/050339 dated Dec. 13, 2010, 5 pages.
 International Search Report for Application No. PCT/US2011/48686 dated Apr. 9, 2012, 5 pages.
 International Search Report for Application No. PCT/US2012/024900 dated Oct. 19, 2012, 4 pages.
 International Search Report for Application No. PCT/US2012/42329 dated Feb. 22, 2013, 13 pages.
 Issue Rolling Stones Magazine, Film Rentals by Vending Machine, 1982.
 Picture of U.S. Installation of Japanese Manufactured VHS Rental Kiosk, 1984.
 Supplemental European Search Report for Application No. EP05736275 dated Jan. 21, 2009, 2 pages.
 Supplemental European Search Report for Application No. EP10810691 dated Feb. 26, 2013, 3 pages.
 Supplemental European Search Report for Application No. EP10814374 dated Jan. 16, 2015, 4 pages.
 Supplemental European Search Report for Application No. EP10814375 dated Jan. 16, 2015, 4 pages.
 Supplemental European Search Report for Application No. EP10815879 dated Mar. 19, 2013, 2 pages.
 Supplemental European Search Report for Application No. EP11820476 dated Jun. 22, 2015, 2 pages.
 Supplemental European Search Report for Application No. EP12799917 dated Sep. 19, 2014, 2 pages.
 Supplementary European Search Report for Application No. EP05736275, dated Jan. 30, 2009, 3 pages.
 Technophobe's best friend by McClatchy, Smith Erika, McClatchy-Tribune Business news Oct. 22, 2007.

* cited by examiner



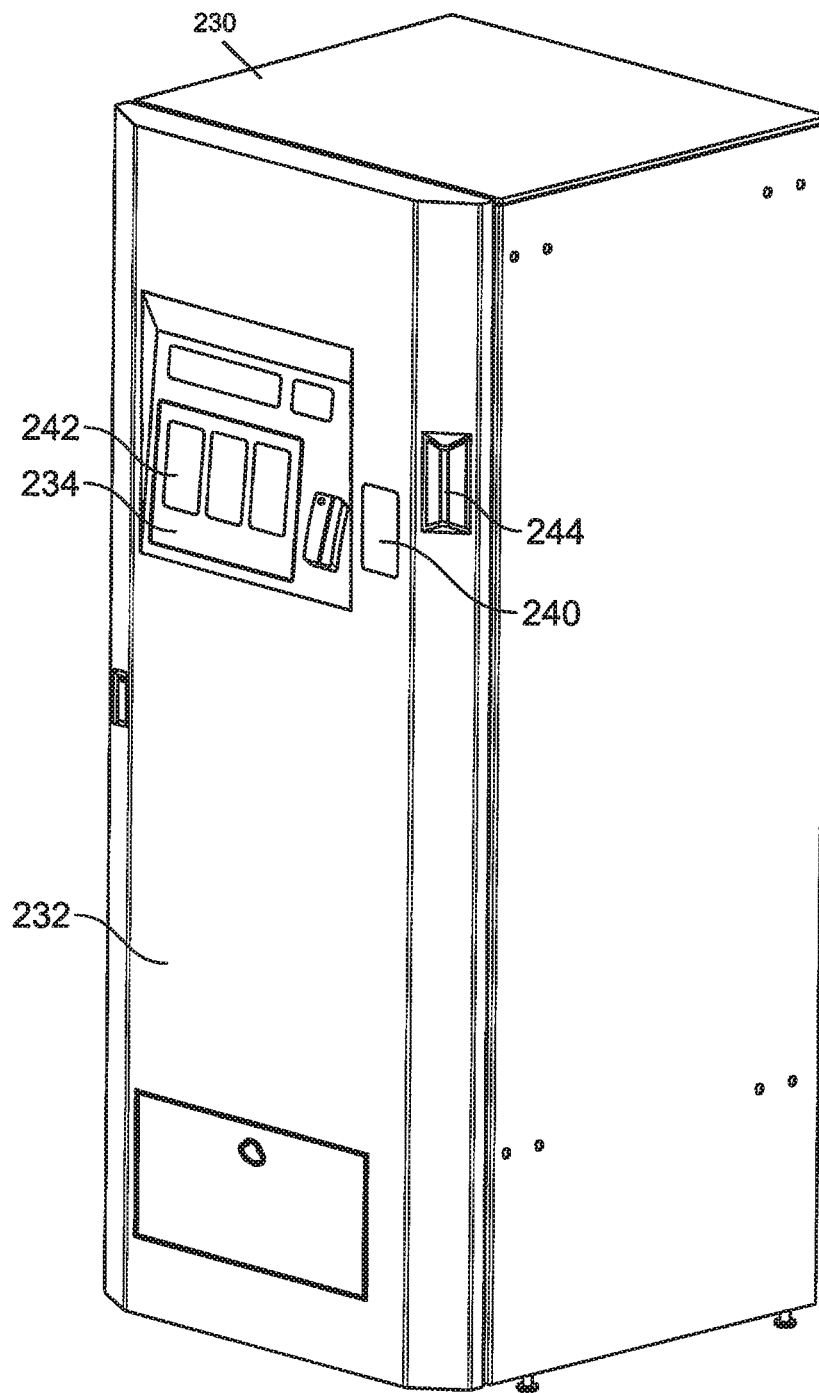


FIG. 2

FIG. 3

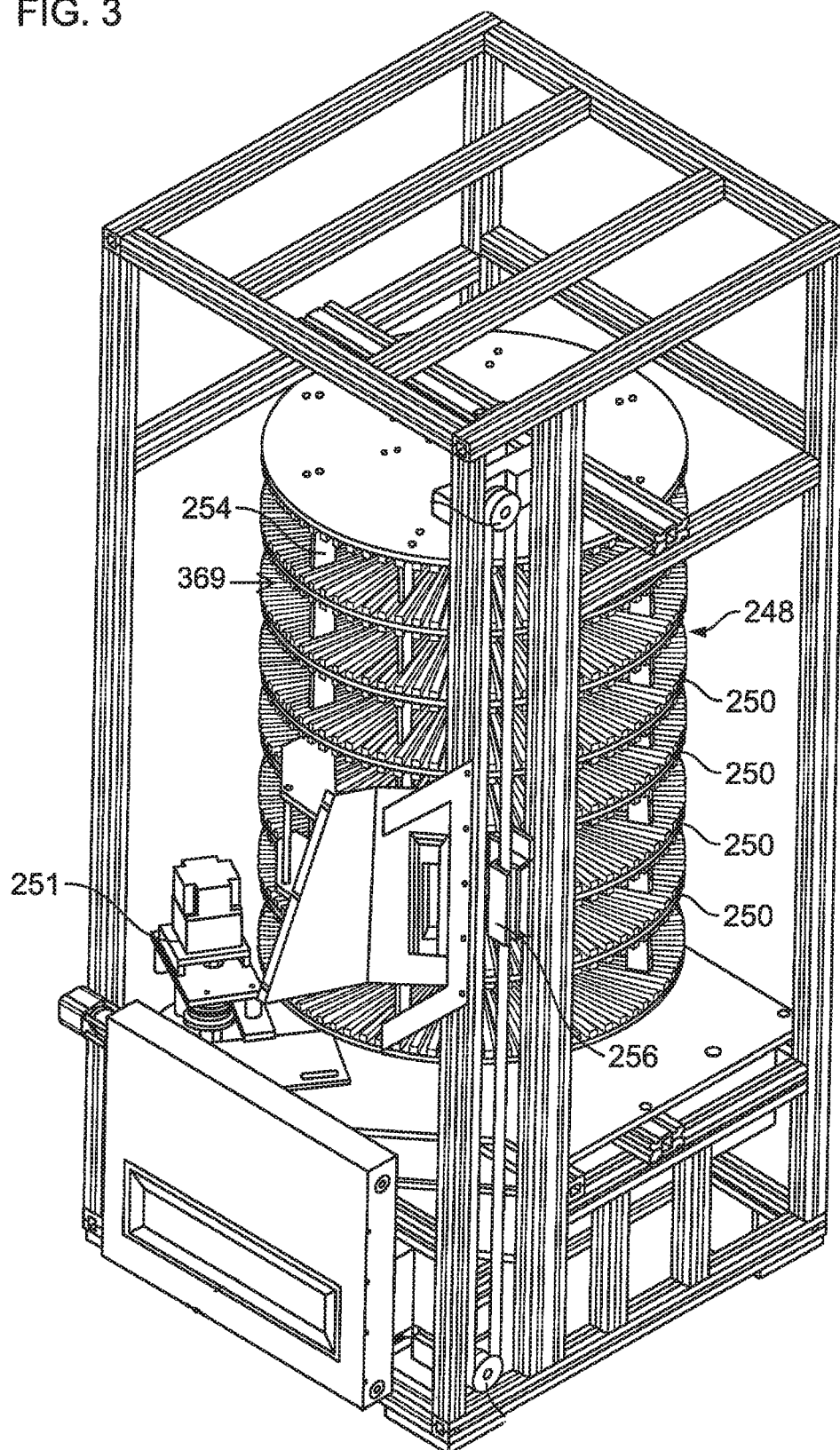
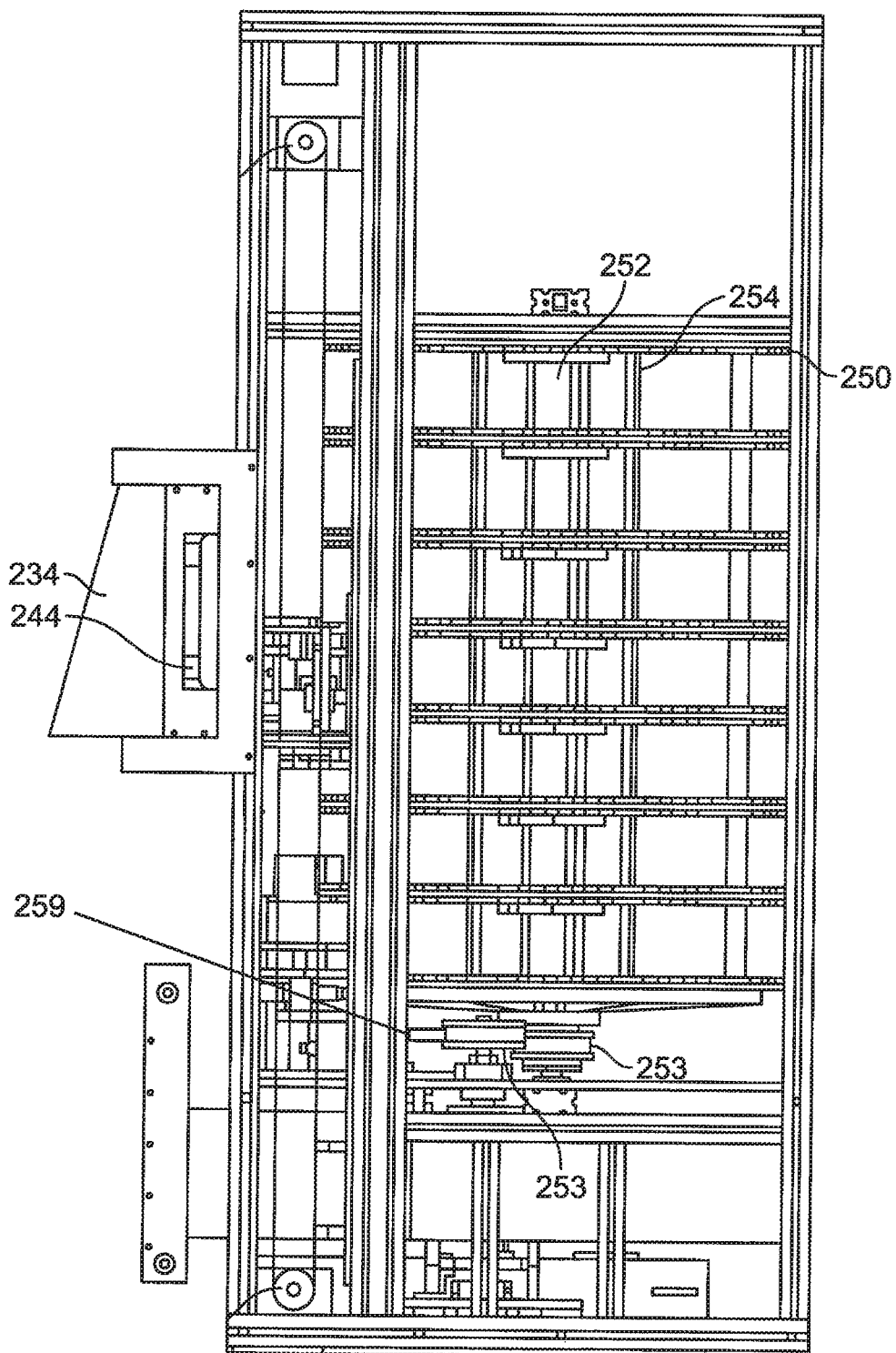


FIG. 4



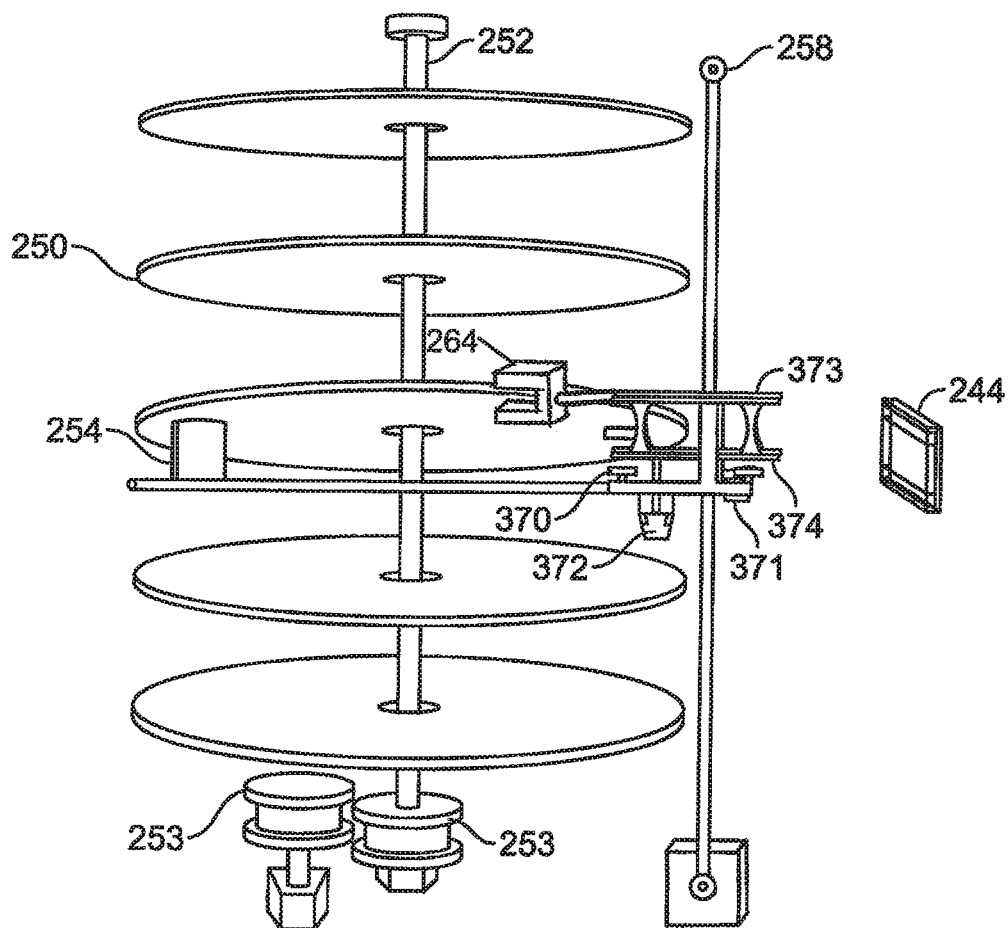


FIG. 5

FIG. 6

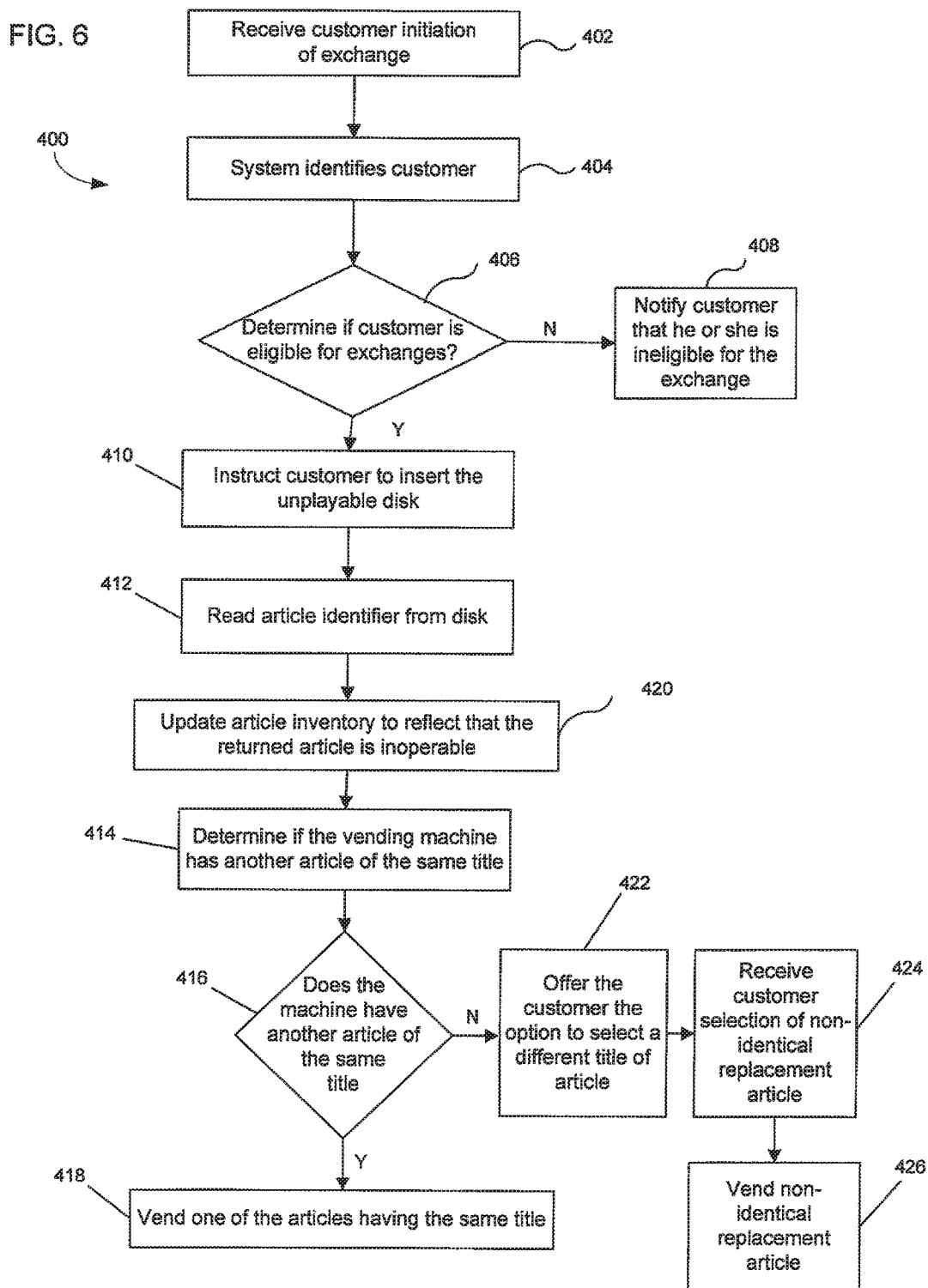


FIG. 7

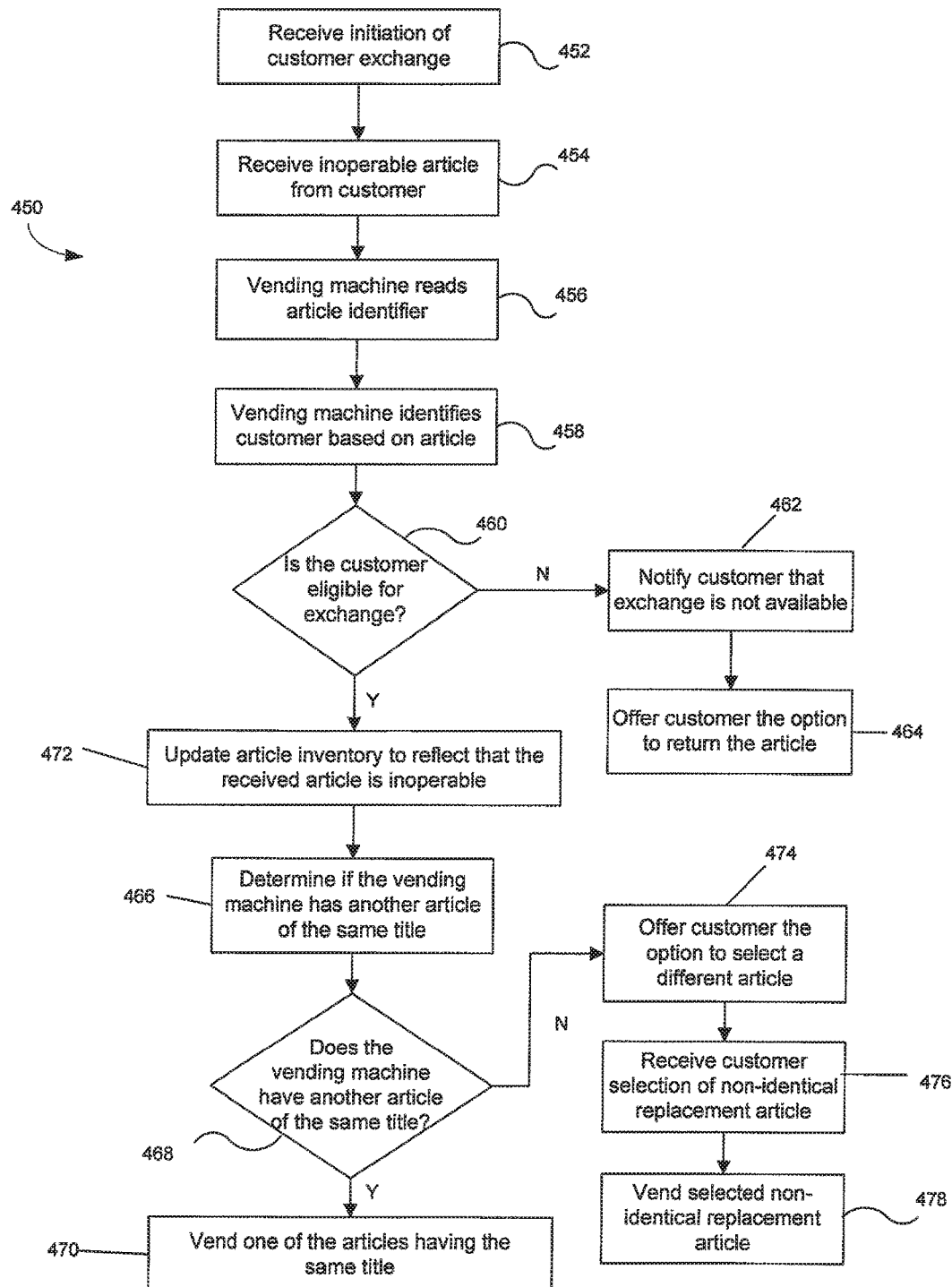


FIG. 8

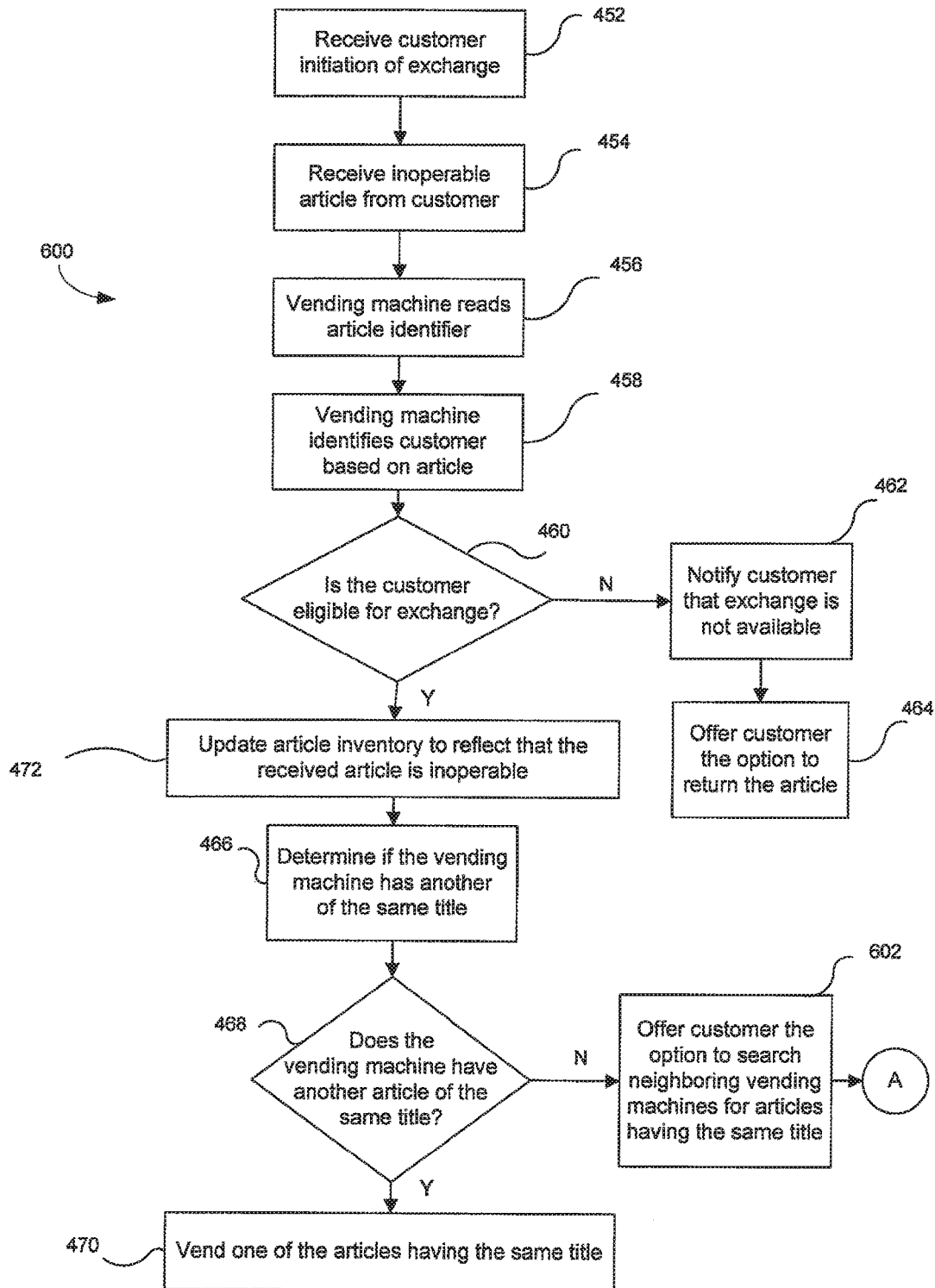
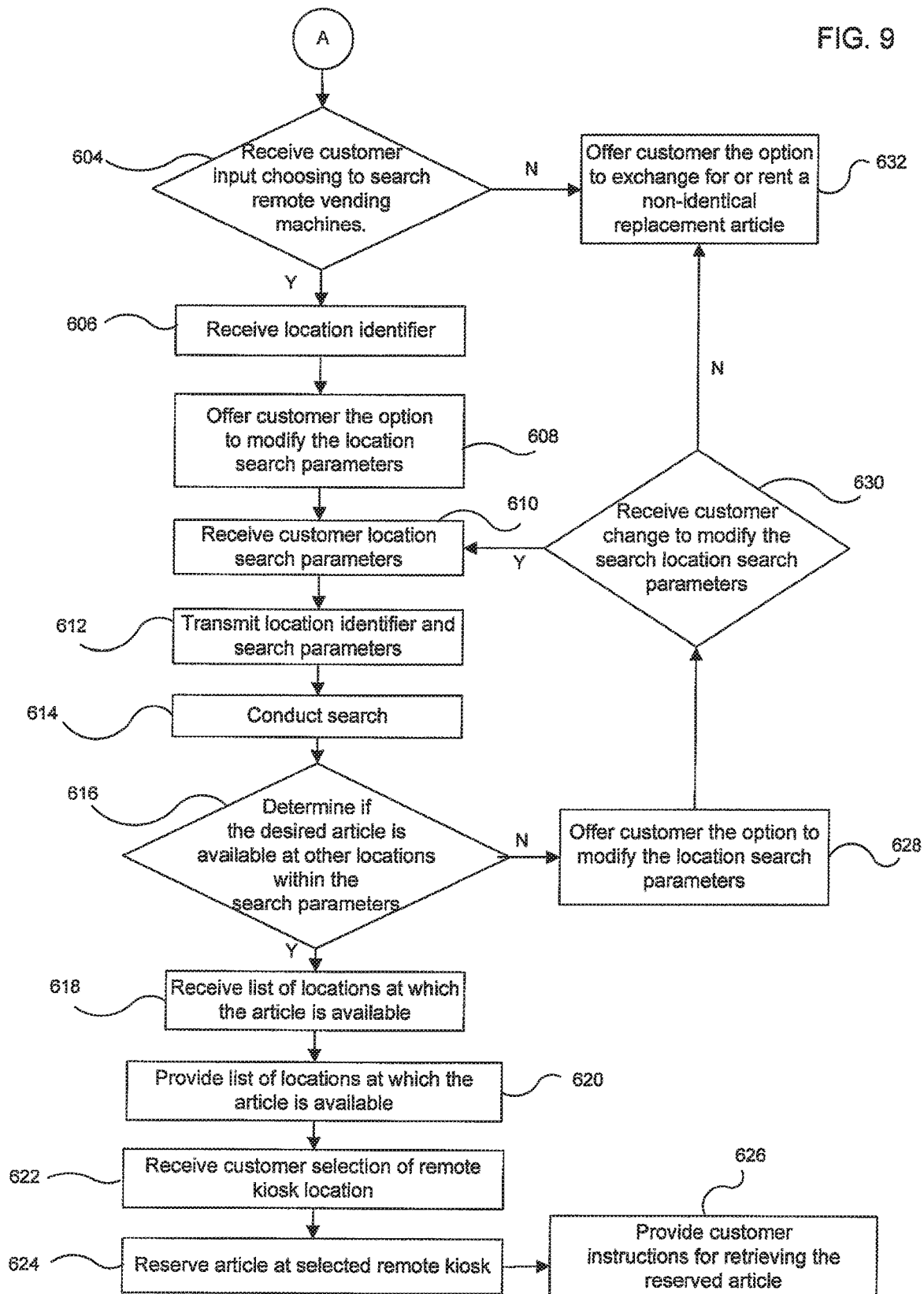


FIG. 9



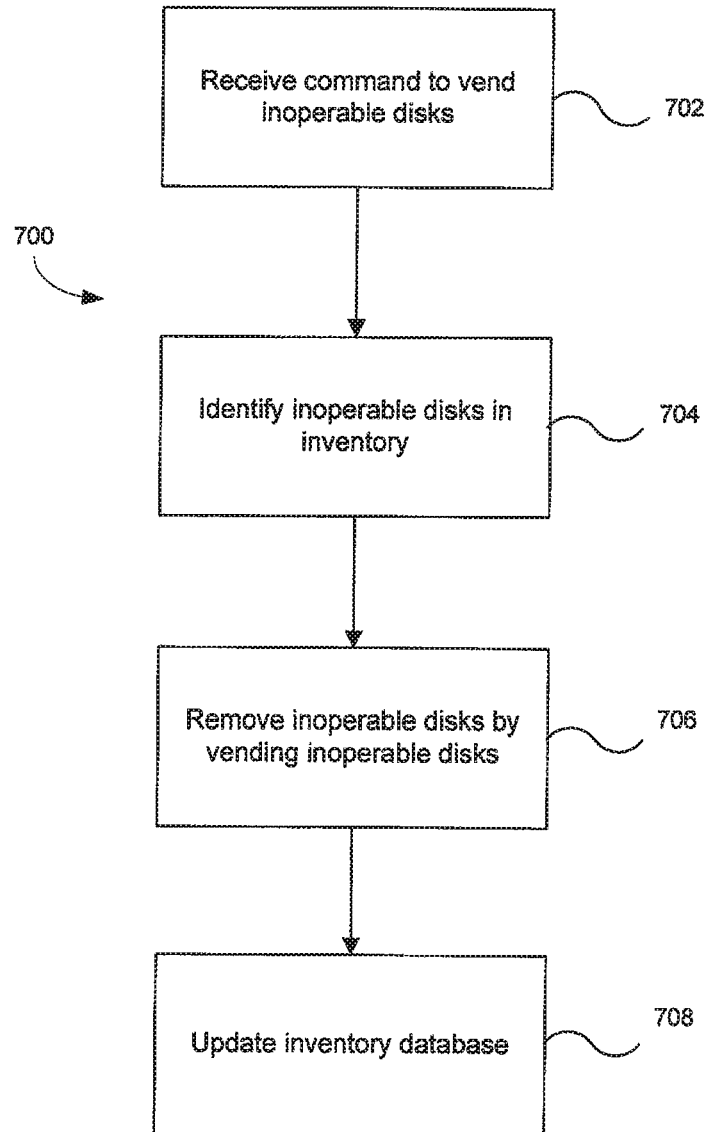


FIG. 10

FIG. 11

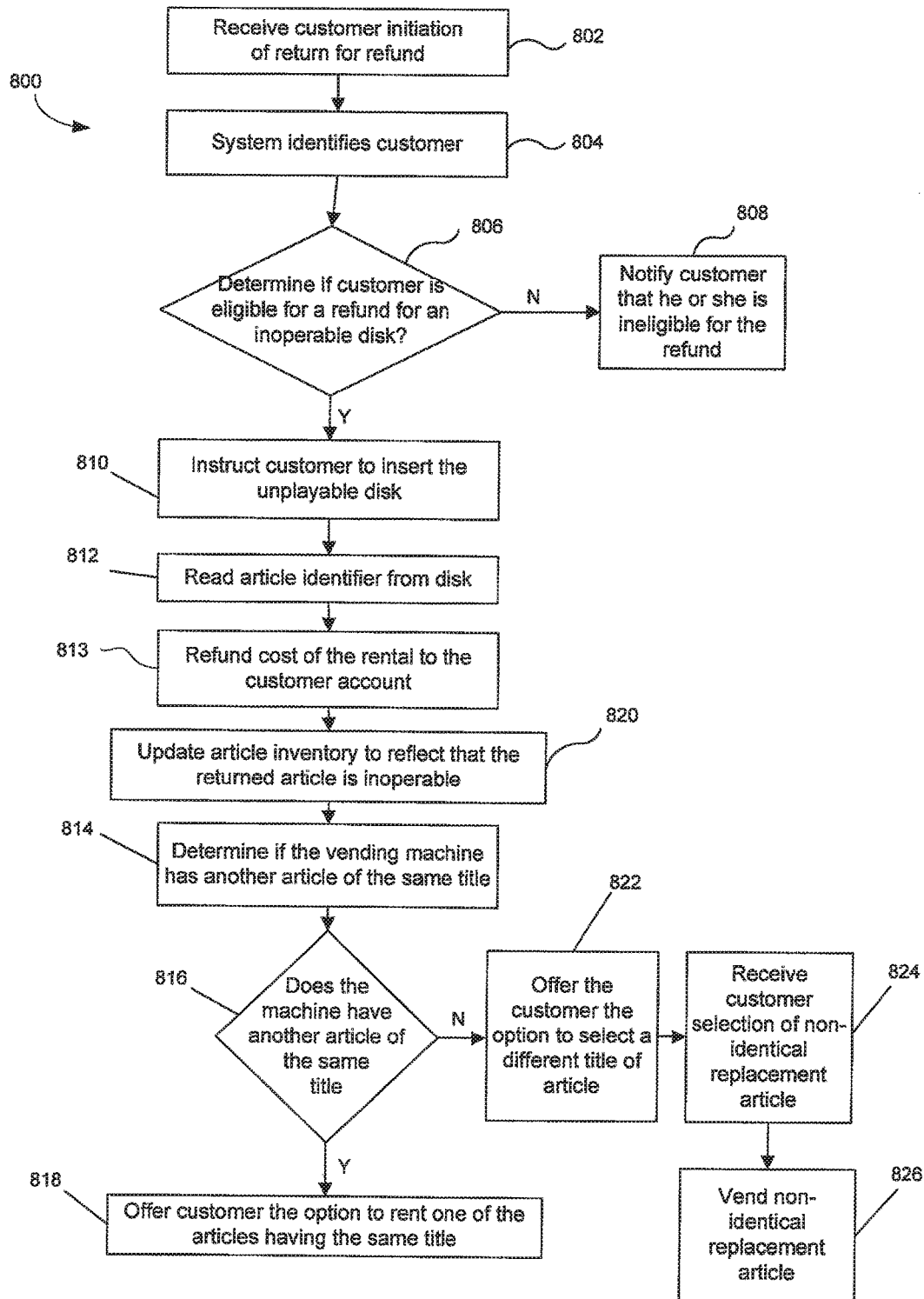


FIG. 12

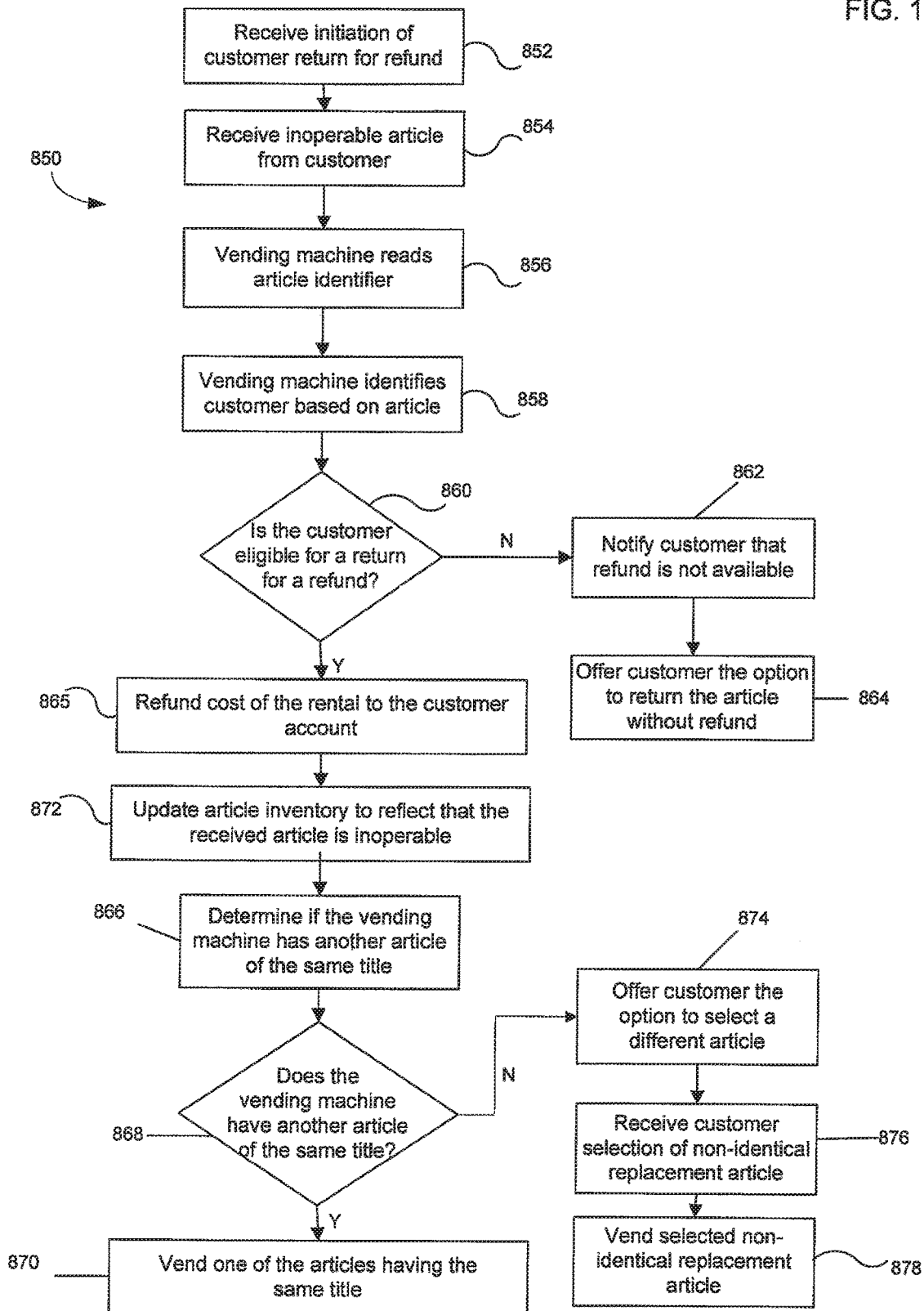
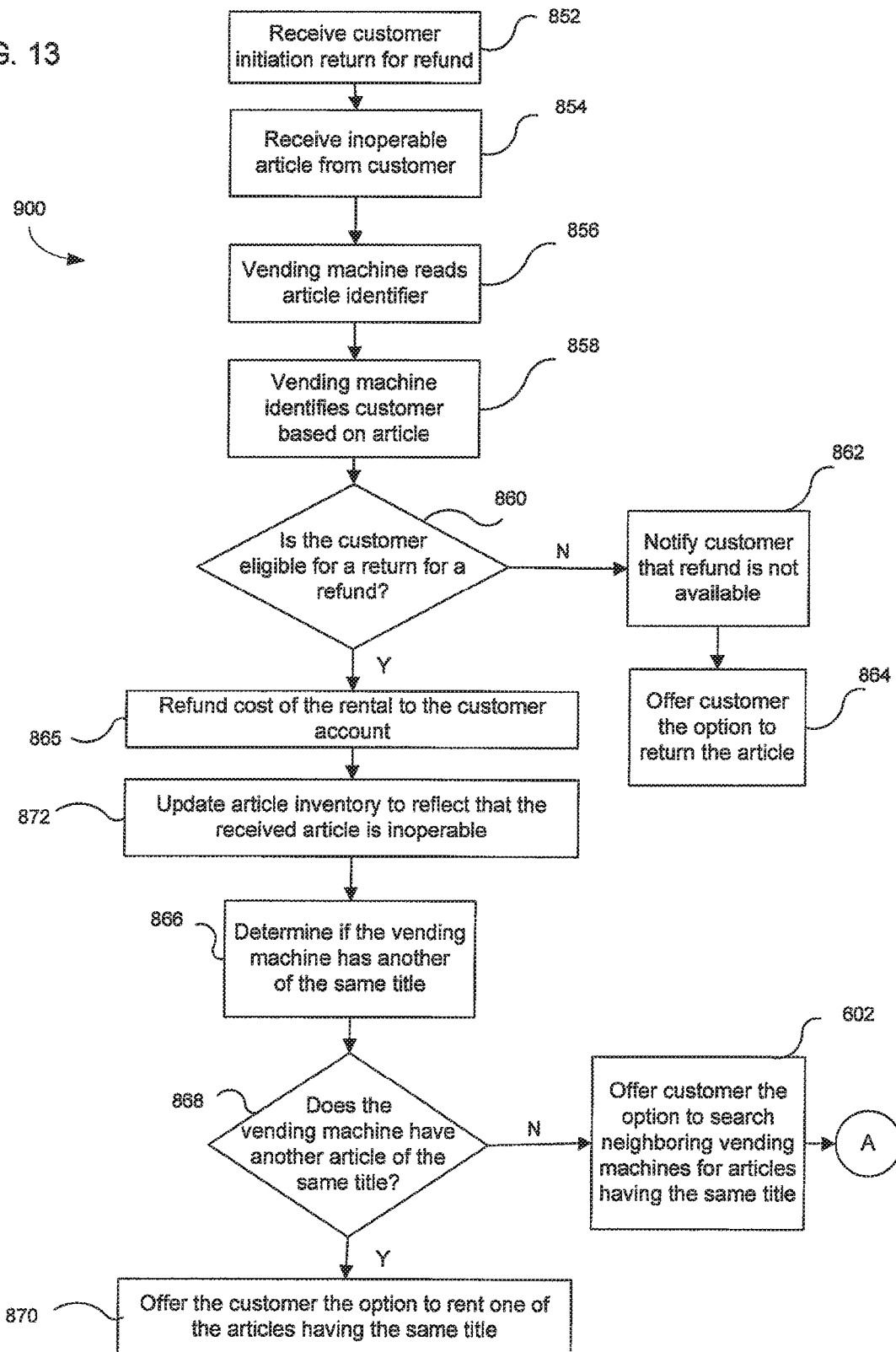


FIG. 13



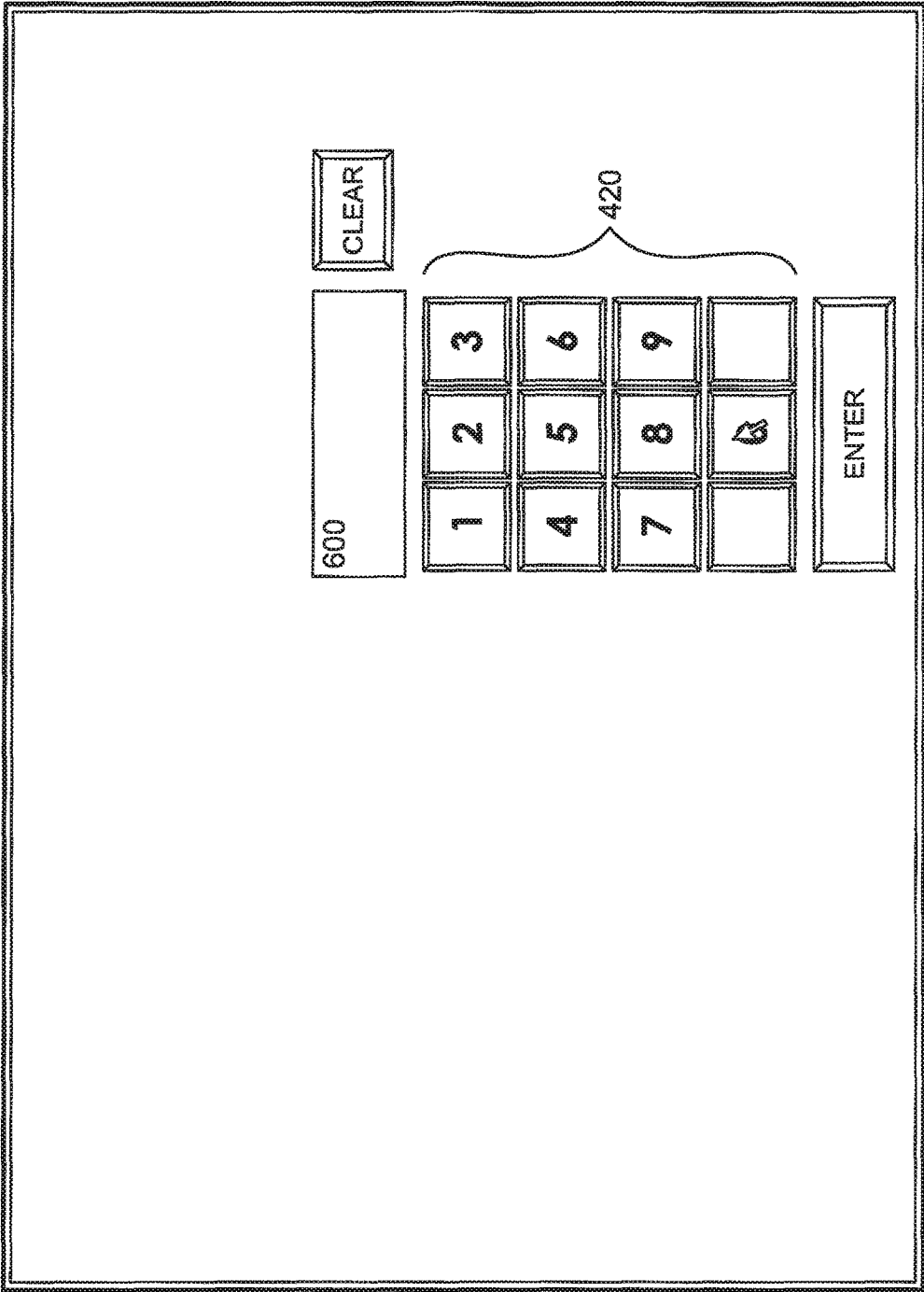


FIG. 14

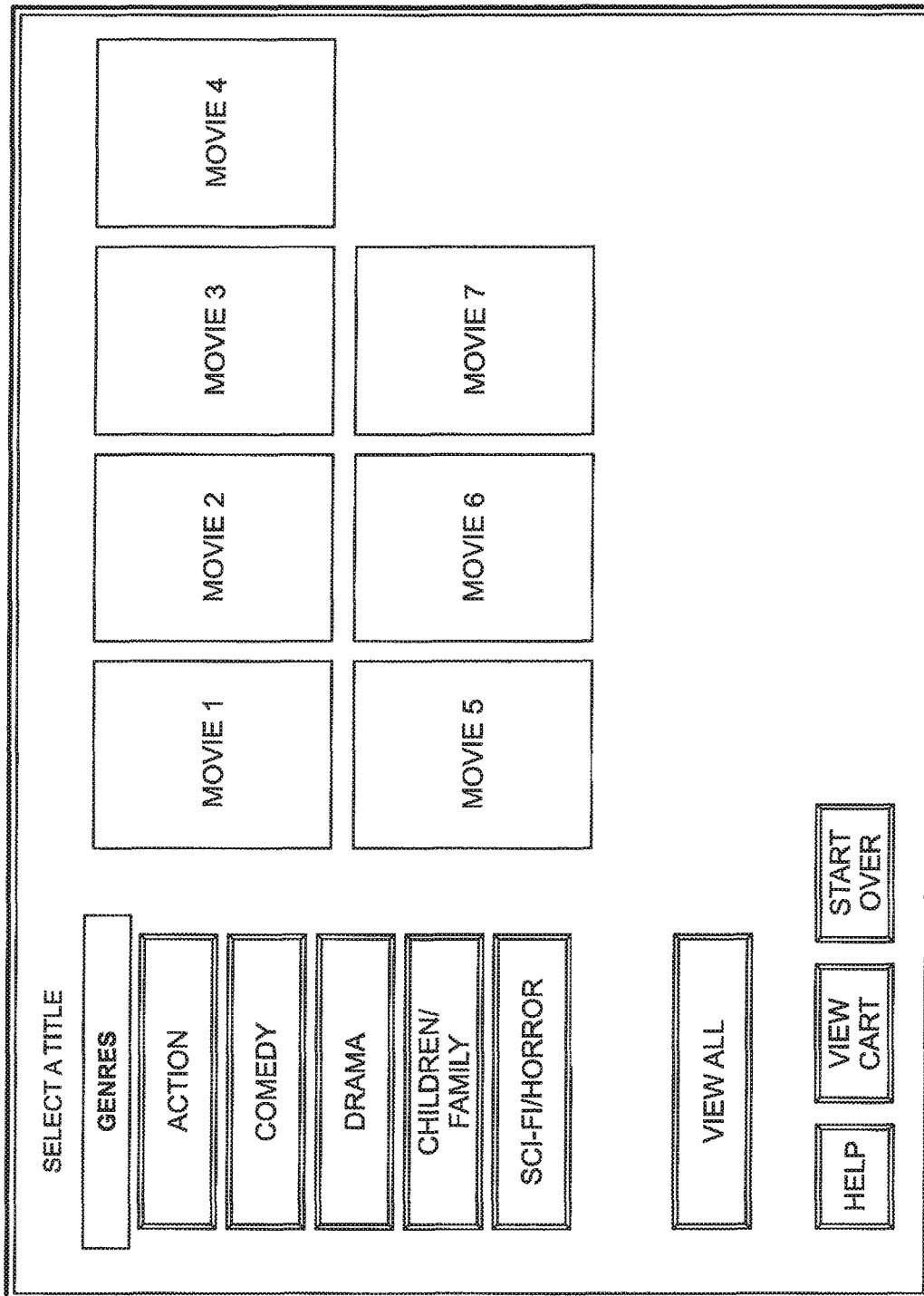


FIG. 15

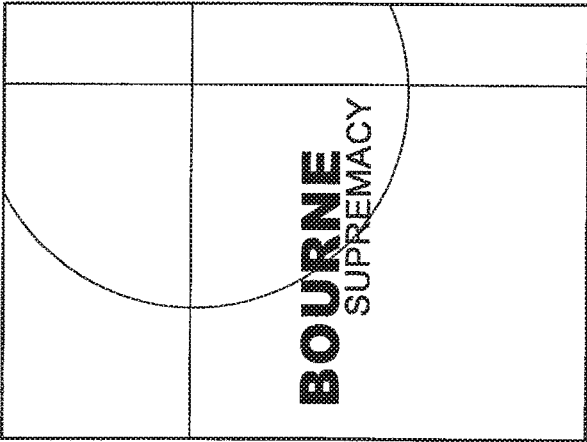
		<p>Starring Matt Damon, Franka Potente, Brian Cox</p> <p>Director Paul Greengrass</p> <p>Format</p> <p>Running Time 01:49</p> <p>Rating 7</p> <p>Matt Damon returning as trained assassin Jason Bourne in The Bourne Supremacy.</p>
<p>Rental Fee: \$1.00per day</p> <p>Due Day: Wednesday</p> <p>Due Time: 10:00PM</p>		<p>VIEW CART</p> <p>START OVER</p> <p>HELP</p>
<p>BACK</p> <p>RENT</p>		

FIG. 16

SHOPPING CART

Title	Rent/Buy	Due Date	Due Time	Price	Remove
The Bourne Supremacy	*Rent	02/09/2005	10.00 PM	\$1.00	Remove

Sub Total

Tax

Total

\$1.00

\$0.05

\$1.05

HELP

START OVER

ADD ANOTHER MOVIE

PROMO CODE

CHECKOUT

FIG. 17

1

ARTICLE VENDING MACHINE AND METHOD FOR EXCHANGING AN INOPERABLE ARTICLE FOR AN OPERABLE ARTICLE

CROSS REFERENCE

This application is continuation application of U.S. patent application Ser. No. 14/668,921 which was filed on Mar. 25, 2015 entitled "Article Vending Machine and Method for Exchanging an Inoperable Article for an Operable Article"; and U.S. patent application Ser. No. 14/668,921 is a continuation application of Ser. No. 12/554,906, which was filed on Sep. 5, 2009 and issued as U.S. Pat. No. 9,104,990 entitled "Article Vending Machine and Method for Exchanging an Inoperable Article for an Operable Article" both of which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

The present invention relates to improvements in article dispensing machines and components and methods related to the same. More particularly, the present invention relates to a digital video disc (DVD) dispensing apparatus and method for exchanging an inoperable article for an operable one.

BACKGROUND AND SUMMARY OF THE INVENTION

While the present invention is often described herein with reference to a digital video disc distribution system, an application to which the present invention is advantageously suited, it will be readily apparent that the present invention is not limited to that application and can be employed in article dispensing systems used to distribute a wide variety of rentable articles.

An improved DVD dispensing machine is disclosed in commonly owned U.S. Pat. No. 7,234,609, which is herein incorporated by reference in its entirety. The invention of the U.S. Pat. No. 7,234,609 patent and the present invention can function as a DVD dispensing machine-based distribution system that will typically have multiple units of each new release per DVD dispensing machine. The dispensing machines of the U.S. Pat. No. 7,234,609 patent and the present invention can stock up to two thousand DVDs (movies, games or other entertainment content), making the system competitive with existing brick-and-mortar video rental superstores.

The dispensing machine and system of the U.S. Pat. No. 7,234,609 patent and the present invention distinguishes itself from such stores by offering major benefits not conventionally offered by such stores, including additional cross-marketing programs promotional rentals for a certain amount of dollars spent at the hosting store) and convenience (e.g., open always).

The dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention yields a competitive advantage in the DVD rental marketplace by offering consumers cross-marketing/promotional programs, convenience of selection (e.g., computer-based searches for movies and recommendations based on consumer profiles), and potentially extended hours. The present invention employs a more cost-effective, convenient platform than brick-and-mortar stores. In addition, with the present invention, DVD dispensing machines can be situated in hosting locations having

2

high foot traffic, such as at a popular grocery store, restaurant, drug store, and/or other popular hosting locations.

The dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention can be operated at a substantial savings over the costs associated with traditional brick-and-mortar video rental stores. For example, the present invention does not require hourly employees manning the dispensing machines or restocking them with inventories, due to the ability of the article transport storage units to be delivered to/picked up from host locations by third-party delivery services, such as traditional or contracted courier services.

Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention does not require an on-site store manager because all operational decisions can be made at a centralized location by a management team offsite remote from the hosting locations. Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention does not require significant physical space. Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention has low operating costs because no heating or air conditioning is required for the dispensing machines and they consume a relatively low level of electrical energy. In addition, the dispensing machine of the U.S. Pat. No. 7,234,609 patent has low maintenance costs and downtime.

The dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention addresses the shortcomings of traditional brick-and-mortar stores in a convenient and cost-effective delivery vehicle having the added bonus of serving as an effective promotional platform that drives incremental sales to hosting locations. In addition, the dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention overcomes these disadvantages by at least offering more new releases and older selections for any given time period, and lower cost per viewing with significantly more convenience than Internet-based and pay-per-view services.

The dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention is a fully automated, integrated DVD movie video and video game rental and/or purchase systems. It preferably incorporates robust, secure, scalable software that provides a fully personalized user experience and real-time feedback to hosting locations and advertisers, scalable hardware that leverages existing technologies such as touch screen, focused audio speakers and plasma video monitors, technology utilizing the Internet through a system website, and an article transport storage unit that facilitates the exchange of new DVDs for old DVDs in each machine with virtually no need for human intervention. These technologies and others fill long-felt needs in the art and give advantages over conventional video distribution options. The dispensing machine of the U.S. Pat. No. 7,234,609 patent and the present invention functions as much as a promotional platform as it does a rental kiosk.

By utilizing the dispensing machines and the hilly-interactive, real-time, linked Internet website, consumers can rent one or more MD movie videos, video games, or other entertainment content directly from dispensing machines as well as indirectly by making a rental reservation through the website for later pickup at a conveniently located machine. These dispensing machines are preferably networked with each other, with the inventory control and/or supply office and with the system website by phone-line, DSL, or other Internet connection at each hosting location. Through this linked network, the rental experience for each consumer can

be customized based on a profile for each consumer, such as via personalized home pages and rental screens.

As with any DVD rental system, from time to time a user may return a damaged or otherwise unplayable disk, which may later be rented out to a customer who receives the unplayable disk. The present invention is directed to a DVD dispensing machines and method for permitting a customer who receives an unplayable disk to exchange that unplayable disk for a playable disk. The present invention enables a user to return the unplayable disk to the article vending machine, indicate that the user wishes to exchange an unplayable disk via a user interface, and exchange the unplayable disk for a functional one. In one embodiment, instead of permitting an exchange when a customer returns an unplayable disk, the article dispensing machine may automatically reimburse the user the cost of the rental for the unplayable disk.

In certain embodiments, the article dispensing machine may first determine whether the customer is eligible to exchange the disk based on a customer criteria. This may be desirable to prevent a customer from repeatedly fraudulently claiming that a disk is inoperable in order to exchange it for a new disk without paying an extra fee. This feature may also be desirable to limit situations in which a customer has repeated problems playing various disks due to deficiencies with the customer's disk player rather than due to any problem with the disks. For example, the article dispensing machine may not permit exchange if the customer has used the exchange function for more than 20% of the customer's rentals, which may indicate that the customer is merely using the exchange function to try to get a new rental without paying another fee. In some embodiments, in response to a customer request to exchange a disk, the dispensing machine may determine whether the vending machine contains other disks of the same title. If the dispensing machine does not contain another disk of the same title, the machine may offer the customer the option to exchange the unplayable disk for a disk of a different title. Alternatively, or additionally, the dispensing machine may determine which other dispensing machines in the area have a disk of the same title and may provide the customer the choice to exchange for those disks located at a different vending machine. In certain embodiments, in response to a request from a designated service person, the article vending machine may be configured to automatically purge all of the articles that have been returned because they were inoperable.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an illustration of a system for communicating and processing information in a network of article dispensing machines and dispensing apparatus;

FIG. 2 is a perspective view of an article dispensing machine constructed in accordance with the principles of the present invention;

FIG. 3 is a partially open perspective view of a portion of the article dispensing machine of FIG. 2 with certain elements removed for clarity;

FIG. 4 is a plan view of the portion of the article dispensing machine of FIG. 3;

FIG. 5 is a perspective view of portions of the article dispensing machine of FIG. 2 with certain elements removed for clarity;

FIG. 6 is a flowchart illustrating an order of operations performed by an article dispensing machine for exchanging an inoperable article for an operable one;

FIG. 7 is a flowchart illustrating a second embodiment of an order of operations performed by an article dispensing machine for exchanging an inoperable article for an operable one;

FIG. 8 is a flowchart of illustrating an order of operations performed by an article vending machine connected to a network for exchanging an inoperable article for an operable one;

FIG. 9 is a continuation of the flowchart of FIGS. 8 and 13;

FIG. 10 is a flowchart of illustrating an order of operations performed by an article vending machine for dispensing inoperable articles;

FIG. 11 is a flowchart illustrating an order of operations performed by an article dispensing machine for receiving an inoperable article and providing a refund for the cost of the rental of the inoperable article;

FIG. 12 is a flowchart illustrating a second embodiment of an order of operations performed by an article dispensing machine for receiving an inoperable article and providing a refund for the cost of the rental of the inoperable article;

FIG. 13 is a flowchart of illustrating an order of operations performed by an article vending machine connected to a network for receiving an inoperable article and providing a refund for the cost of the rental of the inoperable article;

FIGS. 14-16 are illustrations of exemplary article browsing and search screens for an article dispensing machine.

FIG. 17 is an illustration of an exemplary article shopping cart screen for an article dispensing machine.

DETAILED DESCRIPTION OF THE INVENTION

While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

FIGS. 1-3 illustrate an article dispensing machine designated 230. Article dispensing machine 230 may be one of a plurality of article dispensing machines included within an article distribution system having a plurality of such machines situated at a plurality of hosting locations. The article dispensing machines of a particular article distribution system preferably form a network. As such, those machines are preferably in electrical communication with each other and with a central server or central controller.

As shown in FIG. 1, each article dispensing machine 230 includes a dispensing machine processor 300, also referred to herein as a vending controller, which is connected to a user interface control system 234 and a code reading device 370 collectively referred to as "the peripheral devices." The processor 300 is capable of executing various programs to provide input to and/or receive outputs from the peripheral devices. Suitable processors for such use are known to those of skill in the art. In addition, the processor is operably connected to at least one memory storage device 281, such as a hard-drive or flash-drive or other suitable memory storage device.

Article dispensing machine memory storage device 281 can include any one or a combination of volatile memory elements (e.g., random access memory (RAM, such as DRAM, SRAM, SDRAM, etc.)) and nonvolatile memory elements (e.g., ROM, hard drive, tape, CDROM, etc.). Moreover, article dispensing machine memory storage

5

device **281** may incorporate electronic, magnetic, optical, and/or other types of storage media. Article dispensing machine memory storage device **281** can have a distributed architecture where various components are situated remote from one another, but are still accessed by processor. Article dispensing machine memory storage device includes an article dispensing machine database **282**.

The article dispensing machines **230** preferably comprise a network of machines in communication with one another. As shown in FIG. 1, in the preferred configuration, the article dispensing machines **230** are networked with one another via a central server or central controller **302** in a hub-and-spoke system. However, optionally, the article dispensing machines may be connected and communicate directly with one another, and/or subsets of article dispensing machines may communicate with one another directly as well as with the central server **302**.

Generally, in terms of hardware architecture, the central server **302** includes a central processor and/or controller, central memory, and one or more input and/or output (I/O) devices (or peripherals) that are communicatively coupled via a local interface. The architecture of the central server is set forth in greater detail in U.S. Pat. No. 7,234,609, the contents of which are incorporated herein by reference. Numerous variations of the architecture of the central server would be understood by one of skill in the art and are encompassed within the scope of the present invention.

Steps and/or elements, and/or portions thereof of the present invention may be implemented using a source program, executable program (object code), script, or any other entity comprising a set of instructions to be performed. When a source program, the program needs to be translated via a compiler, assembler, interpreter, or the like, which may or may not be included within the memory, so as to operate properly in connection with the operating system (O/S). Furthermore, the software embodying the present invention can be written as (a) an object oriented programming language, which has classes of data and methods, or (b) a procedural programming language, which has routines, sub-routines, and/or functions, for example but not limited to, C, C++, Pascal, Basic, Fortran, Cobol, Pert, Java, and Ada. frequency (RF) or other transceiver, a telephonic interface, a bridge, and a router.

When article dispensing machine **230** is in operation, the article dispensing machine processor is configured to execute software stored within article dispensing machine memory, to communicate data to and from the dispensing machine memory, and to generally control operations of article dispensing machine pursuant to the software. The software aspects of the present invention and the O/S, in whole or in part, but typically the latter, are read by processor, perhaps buffered within the processor, and then executed.

When the present invention or aspects thereof are implemented in software, it should be noted that the software can be stored on any computer readable medium for use by or in connection with any computer related system or method. In the context of this document, a computer readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer related system or method. The present invention can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device and

6

execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM, EEPROM, or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via, for instance, optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner if necessary, and then stored in a computer memory.

For communication with the central server **302**, article dispensing machine **230** is equipped with network communication equipment and circuitry. In a preferred embodiment, the network communication equipment includes a network card such as an Ethernet card. In a preferred network environment, each of the plurality of article dispensing machines **230** on the network is configured to use the TCP/IP protocol to communicate via the network **301**. It will be understood, however, that a variety of network protocols could also be employed, such as IPX/SPX, Netware, PPP and others. It will also be understood that while a preferred embodiment of the present invention is for article dispensing machine **230** to have a "broadband" connection to the network **301**, the principles of the present invention are also practicable with a dialup connection using a standard modem. Wireless network connections are also contemplated, such as wireless Ethernet, satellite, infrared and radio frequency networks.

The central controller **302** communicates with the article dispensing machine controllers **300** via the network **301**. The central controller **302** is preferably located at a central station or office that is remote from the plurality of article dispensing machines **230**. The central controller **302** can operate as the server for communicating over the network **301** between the plurality of article dispensing machines **230**. The central controller **302** receives communications and information from the article dispensing machines **230**, and also transmits communications and information to the machines **230**. For example, when a DVD rental transaction is performed at the article dispensing machine **230**, transaction data such as the rented DVD title is then transmitted from the machine **230** to the central controller **302** via the network **301**. It will be understood that central servers in general, such as the central controller **302**, are often distributed. A plurality of central servers/controllers **302** may optionally be arranged in "load balanced" architecture to improve the speed and efficiency of the network. To accomplish the implementation of multiple controllers **302**, the controllers **302** may be in communication with router/distributor **303**.

The central controller **302** is also in communication with a central database **304**. The central database **304** stores information regarding the transaction network, customers and customer transactions. For example, the central database

304 stores data regarding the vending inventory at each of the plurality of article dispensing machines **230**. The central database **304** also stores sales information regarding the sales quantities of the vending merchandise stored in the machines **230**. For example, the central database **304** stores information regarding the sales totals for each DVD title and for each machine **230** vending location. Central database **304** also stores user information and rental transaction information, such as user IDs, PINs, the date on which DVDs are due to be returned, and the date on which DVDs were rented from the machines **230**. Some of this information is also preferably stored in article dispensing machine database **282**. The central database **304** may also store a master inventory list of the DVDs housed in each of the dispensing machines.

Central database **304** is preferably a relational database, although other types of database architectures may be used without departing from the principles of the present invention. For example, database **304** may be a SQL database, an Access database or an Oracle database, and in any such embodiment have the functionality stored herein. Central database **304** is also preferably capable of being shared, as illustrated, between a plurality of central controllers **302** and its information is also preferably capable of being transmitted via network **301**. It will be understood that a variety of methods exist for serving the information stored in central database **304**. In a preferred embodiment, .net and Microsoft Reporting Services are employed, however, other technologies such as ODBC, MySQL, CFML and the like may be used.

The central controller **302** and central database **304** are also preferably accessible by a personal computer **306**. The personal computer **306** will be understood as comprising hardware and software consistent with marketable personal computers, such as a display monitor, a keyboard and mouse and a microprocessor. The personal computer also comprises Internet browser software such as Firefox or Internet Explorer or another such interface. Using the browser software, a user at the personal computer **306** can access a web interface through the central controller **302**. To that end, central controller **302** preferably comprises web server software such as IIS or Apache. It will be understood that a variety of web server software and web browser software exists to implement the principles of the present invention without departing therefrom. Through the web browser software, the personal computer **306** communicates with the central controller **302** and allows the user to login to a central command functionality of the central controller **302** and to view and modify data stored in the central database **304**. The browser interface also allows the user to perform certain system functions, which will affect the inventory and behavior of the article dispensing machines **230**.

In a preferred embodiment, a financial server **305** is also in communication with the network **301**. It will be understood that a variety of financial services exist for processing financial information via the Internet and other networks **301**. Those services allow for the processing of credit card and debit card information, so that users of the services do not have to interface directly with credit and debit card companies. In FIG. 1, the financial server **305** is illustrated as a single server, although the financial server **305** may comprise an entire sub-network of financial servers **305** responsible for processing financial information.

As shown in FIG. 2, article dispensing machine **230** includes a machine housing **232** with front, rear, top, bottom and side panels. The machine housing **232** is preferably a combination molded fiberglass and sheet metal cabinet.

However, those skilled in the art will appreciate that the housing can be constructed from a variety of other suitable materials and with a variety of other suitable manufacturing techniques.

As shown most clearly in FIG. 2, a user interface portion **234** of housing **232** includes a card reader **240**, a keypad and/or touch screen **242** and an article transfer opening **244** sometimes referred to herein as a receptacle. The card reader **240** is preferably designed in known fashion to read magnetically encoded membership and/or credit cards for authorizing the distribution of articles of inventory through the article transfer opening **244**. Keypad and/or touch screen **242** permits consumers and/or inventory stocking personnel to communicate with the dispensing machine **230** and/or a central office linked in electrical communication with the dispensing machine. Keypad and/or touch screen **242** also permits consumers and/or inventory stocking personnel to enter appropriate commands directed to carrying out specific machine tasks. It will be appreciated that the optional touch screen includes a monitor made with known technologies making it capable of being utilized as a user interface for entry of commands designed to carry out machine tasks.

Furthermore, it will be appreciated that additional user interface portions having additional or even identical user interface components could be incorporated within article dispensing machine **230**. For example, these components could be incorporated on other panels of the housing **232** of machine **230** so that the machine can be used simultaneously by multiple consumers, translating into more efficient distribution of articles in high traffic areas.

Turning now to the functioning of the machine during a consumer transaction, as a consumer approaches an article dispensing machine, the consumer observes the display monitor and the user interface **234**. The consumer may also observe a plasma/LCD monitor displaying marketing information, or a lightbox containing marketing information for branding the vending apparatus **230**. The consumer then enters the appropriate commands at the user interface control **234** associated with the dispensing machine to select a disk to be dispensed by the machine. The user interface can employ simple menus and a fixed set of keys for consumers to make their selections, it can employ break-resistant touch screens, or it can employ a combination of both. Once a selection has been made, the consumer then merely inserts his/her magnetically encoded dispense activation card into the card reader **240** positioned at the front of the dispensing machine **230** and, in response, the machine will dispense the selected disk without the need for further input by the consumer.

Referring now to FIG. 3, which shows the components positioned in the interior of dispensing machine **230**, the article dispensing machine includes a storage device **248** which is a carousel-style, cylindrical storage facility having a plurality of compartmentalized rows **249** defined by circular-shaped storage racks **250** sharing a common central axis. Each of the rows has a plurality of compartments **369**. Each storage rack **250** includes radially extending, angularly separated compartment panels defining article storage compartments **369** which are designed to receive and retain flat-type pack articles, such as DVD cases, as desired. The compartment panels are preferably axially aligned to retain the opposing sides of DVD cases at the top and bottom ends thereof. In that regard, the MD cases are preferably retained between successive vertical pairs of storage racks **250**. The storage racks **250** are vertically spaced by axially extending support members **254**.

A first motor **251**, hereinafter referred to as the rotational motor, rotates the storage device **248** about a vertical axis formed by the driven shaft **252**. As shown FIG. 4, rotational motor **251** drives a belt **259**, which in turn rotates wheels **253** and shaft **252** to which the storage racks **250** are attached.

As shown in FIGS. 3 and 4, a selector arm **256** having a picker device **264** which is capable of removing a DVD from the compartments **369**, is adjacent the storage device **248**.

The selector arm **256** may further comprise a conveyor belt **374**, which contacts one of the media products in one of the compartments **369** and conveys the product to the article transfer opening **244** whereby it is delivered to a user on the exterior of the article dispensing machine **230**. The conveyor **374** is driven by a conveyor motor **372**. Further details pertaining to the mechanics and operation of the selector arm are disclosed in commonly owned U.S. Pat. Nos. 7,234,609 and 7,366,586 and U.S. patent application Ser. No. 11/863,909, the contents of which are herein incorporated by reference in their entirety.

As shown in FIG. 5, the dispensing machine contains a code reading device **370**. The code reading device may be an image capture device such as a digital camera, or a constant reading device such as a scanner or a digital video camera or a RF scanner. The code reading device is positioned to read an article identification code from an article as the article is placed in the receptacle **244**. An article database correlates the article identification code to certain article information, such as, for example the title of a DVD.

A first embodiment of a method for exchanging an inoperable disk for an operable one **400** is shown in FIG. 6. The user interface **234** presents a user returning a DVD with the option to request to exchange an inoperable DVD for an operable one as shown in step **402**.

The user interface **234** identifies the customer via information obtained from a card. In this embodiment, the user interface **234** prompts the customer to insert or swipe a membership card into the card reader **240**. Identification information is read from the membership card, which may be a credit or debit card, and the user is identified as shown in step **404**. User identification may be performed by the vending machine processor **300** or the central processor **303**.

Alternatively, as shown in FIG. 7, the identification of the user may be determined based on the returned article. As shown in this second embodiment **450**, the user initiates the exchange of an inoperable disk for an operable one via the user interface, step **452**. The user interface then instructs the customer to insert the inoperable disk into the receptacle **244**, as shown in step **454**. The code reading device **370** then reads the article identifier from the disk as shown in step **456**. The vending controller/processor then references a transaction database to identify the customer to whom the disk having the article identifier has been rented as shown in step **458**. Optionally, the user interface **234** may then request verification from the customer that the system has identified the correct customer.

In the embodiments shown in FIGS. 6 and 7, **400** and **450**, the user's eligibility to perform the exchange is then determined. In a first embodiment, the user's identification information is checked against a customer exchange "blacklist" that identifies users who are prohibited from exchanging an inoperable article for an operable one as shown in steps **406**, **460**. The users may be identified on the exchange blacklist by an identification code, for example, by the card number of the user or by a cryptographic representation of a user card number. The customer exchange blacklist may be stored on the central memory **304** or it may be stored on both the central memory and the memories of the individual

kiosks **281**. If the customer is listed on the customer exchange blacklist, the user interface **234** notifies the customer that he or she is ineligible to exchange the inoperable disk for an operable one, steps **408**, **462**. If the customer is not eligible for an exchange, the kiosk, via the user interface **234** may ask the customer if he or she wants to return the disk, as shown in step **464**, at which point the normal return procedure would be followed.

In a second embodiment, instead of maintaining a blacklist, against which the customer's identification is checked, a customer's rental activity may be dynamically checked for certain eligibility criteria. A history of the customer's rental activity is stored on the central memory **304** or, alternatively, it may be stored on both the central memory and the memories of the individual kiosks **281**.

One such customer criterion may be the percentage of transactions that result in exchanges of inoperable articles. For example, a customer who has exchanged an inoperable article during more than 20% of his or her rental transactions may be added to the blacklist. Another such criterion may be the frequency of customer exchanges. For example, a customer who has exchanged at least one inoperable article per week for four consecutive weeks may be blacklisted. Another such criterion may be the number of current rentals that the customer has, whereby the customer would not be permitted to perform an exchange if he or she has more than X number of rentals checked out. Another such criterion may be the number of exchanges, in which, a customer who has exchanged more than X number of times may be blacklisted. Yet another such criterion may be the time since the last exchange, for example a customer may be added to the blacklist if he or she has exchanged an inoperable article within the past day. In addition, a blacklist may use more than one of these criteria. For example, customers may be added to the blacklist if they exceed the set percentage of transactions that result in exchanges or if the customer has exchanged an article within the past day.

In the embodiment in which a customer blacklist is used, the above-listed criteria may also be used to determine when a customer is placed on the blacklist. A customer may be removed from the blacklist when that customer's transaction history no longer satisfies the blacklist criteria. For example, if a customer has been added to the blacklist because his or her percentage of transactions that resulted in exchanges exceeded the predetermined threshold, the customer may be removed from the blacklist when the customer's percentage of rentals that result in exchanges drops below that predetermined threshold. Alternatively, a customer may be removed from the blacklist manually by a customer service person with access to and permission to edit the blacklist via a personal computer in communication with the central server.

If the customer is determined to be ineligible for an exchange in process **400**, as shown in step **410**, the user interface **234** instructs the customer to insert the inoperable disk into the receptacle **244**. The system then reads the article identifier from the disk using the code reading device **370**, as shown in step **412**. An article identifier database which may be stored on the kiosk memory **281**, is accessed to determine the type of the article, which, in the case of a DVD or the like is representative of the title of the article, and which may be represented by a code. Once the type of the returned article is determined (the title of the DVD), the system accesses an inventory database which may be stored on the kiosk memory **281** to determine whether the article dispensing machine contains another article of the same type, herein referred to as an "identical replacement article"

11

steps **414**, **466**. If the article dispensing machine contains one or more identical replacement articles available, the article dispensing machine dispenses one of the replacement articles, as shown in steps **416**, **418**, **468**, **470**. As shown in steps **420**, **472**, the article dispensing machine also updates its article inventory database to identify the returned inoperable article as “inoperable” **420**, **472**. Articles in the inventory database marked as “inoperable” are unavailable for rental. Once the user has inserted the inoperable DVD into the receptacle **244**, the inoperable DVD is transferred via the transfer mechanism **256** to an open storage slot **369** in the vending machine.

If the article dispensing machine does not contain one or more identical replacement articles available for rental, in one embodiment, the user interface **234** prompts the user to select another non-identical replacement article from the inventory of the article dispensing machine, as shown in steps **422**, **474**. FIGS. **12-17** show exemplary article selection and browsing screens of a user interface. The user then proceeds to select a non-identical replacement article in steps **424**, **476**, which may be vended to the user at no extra cost, steps **426**, **478**.

As shown in FIGS. **11-13**, in an alternative embodiment, the article dispensing machine may provide the customer with a refund or credit corresponding to the cost of the rental of the article instead of providing a replacement article in response to the consumer’s request to return the inoperable article. FIG. **11** shows an order of operations **800** for an article dispensing machine configured to identify the customer based on information obtained from a customer identification card or the like, determine if the customer is eligible for a refund, and, if so, provide a credit or refund to the customer. Specifically, in step **802**, the article dispensing machine receives the customer initiation of a return of an inoperable article for a refund via a user interface **234**. The system then identifies the customer based on information received from a customer identification card or the like, as described above and as shown in step **804**. Using the customer identification, the article dispensing machine then determines if the customer is eligible for a refund for the customer’s return of an inoperable disk, as shown in step **806**. As discussed above, such a determination may be based on a customer blacklist or the customer’s rental activity. If the customer is ineligible for the refund, the article dispensing machine notifies the customer accordingly, as shown in step **808**.

If, on the other hand, the article dispensing machine determines that the customer is eligible to return the inoperable disk for a refund in step **806**, the machine then instructs the customer via the user interface **234** to insert the unplayable disk into the receptacle **244** as shown in step **810**. Once the disk has been received by the article dispensing machine, as shown in step **812**, the code reader **370** reads an article identifier from the disk to determine the identity of the disk as described in detail above. As shown in step **813**, the article dispensing machine then proceeds to refund the cost of the rental for the inoperable disk to the customer’s account. The instruction to provide a customer refund is transmitted from the article dispensing machine **230** to a financial server **305** and may be sent via the central server **302**. As shown in step **820**, the article dispensing machine inventory is updated to reflect that the returned article is inoperable.

As shown in step **814**, the article dispensing machine also determines if there is another article having the same title in the machine’s inventory. If the article dispensing machine has an article of the same title, i.e. an identical replacement

12

article, in its inventory, the machine offers the customer the option to rent one of the identical replacement articles via the user interface **234**, as shown in steps **816** and **818**. If, on the other hand, the machine does not have an identical replacement article in its inventory, it offers the customer the option to select and rent a different article, as shown in steps **822-826**.

FIG. **12** shows an order of operations **850** similar to that shown in FIG. **11**, but, instead of identifying the customer based on information obtained from a customer card, customer identification is based on the identity of the returned article, as described above with respect to FIG. **7**. Specifically, in step **852**, the article dispensing machine receives the customer initiation of a return of an inoperable article for a refund via a user interface **234**. The system then receives the inoperable article from the customer via receptacle **244**, as shown in step **854**.

Once the disk has been received by the article dispensing machine, as shown in step **856**, the code reader **370** reads an article identifier from the disk to determine the identity of the disk as described in detail above. The vending controller/processor then references a transaction database to identify the customer to whom the disk having the article identifier has been rented as shown in step **858**. Using the customer identification, the article dispensing machine then determines if the customer is eligible for a refund for the customer’s return of an inoperable disk, as shown in step **860**. As discussed above, such a determination may be based on a customer blacklist or the customer’s rental activity. If the customer is ineligible for the refund, the article dispensing machine notifies the customer accordingly, as shown in step **862**, and may offer the customer the option to return the article without a refund, as shown in step **864**.

If the customer is eligible to return the article for a refund, as shown in step **860**, the article dispensing machine then proceeds to refund the cost of the rental for the inoperable disk to the customer’s account, as shown in step **865**. The instruction to provide a customer refund is transmitted from the article dispensing machine **230** to a financial server **305** and may be sent via the central server **302**. As shown in step **872**, the article dispensing machine inventory is updated to reflect that the returned article is inoperable.

As shown in step **866**, the article dispensing machine also determines if there is another article having the same title in the machine’s inventory. If the article dispensing machine has an article of the same title, i.e. an identical replacement article, in its inventory, the machine offers the customer the option to rent one of the identical replacement articles via the user interface **234**, as shown in steps **868** and **870**. If, on the other hand, the machine does not have an identical replacement article in its inventory, it offers the customer the option to select and rent a different article, as shown in steps **874-878**.

As shown in FIGS. **8**, **13** and **9**, and processes **600** and **900**, optionally, the article dispensing machine may offer the customer the choice to search the inventories of remotely located vending machines for one or more identical replacement articles located at those remote vending machines and generate a list of remote article vending machines at which an identical replacement article is available. A database of the inventory of the remote article vending machines may be stored at the central memory **304**. A copy of the inventory database may also be stored on the memory of the local kiosk **281**. The user interface **234** may provide the customer with the option to select from the list of remote article vending machines at which an identical replacement article is available and reserve one of the identical replacement

13

articles at a remote vending machine. A further discussion of searching and remotely reserving articles follows.

FIGS. 8 and 13 shows an order of operations 900 and 600 similar to those operations in FIGS. 7 and 12, respectively, but in FIGS. 8 and 13, if an identical replacement article is not present in the vending machine to which the article was returned, instead of or in addition to offering to the customer the option to rent a different article, the article dispensing offers the customer the option to search neighboring vending machines for articles having the same title as the returned article, as shown in step 602.

As shown in FIG. 9, once a request to search the inventory of remote article dispensing machines has been initiated in step 604 the system receives a location identifier, as shown in step 606. The location identifier identifies the location of the user. The location identifier can be received from several sources. First, the location identifier can be received manually from a user at the vending location. In that embodiment, the user interface 234, at the vending apparatus 230 requests that the user provide the location identifier. The user then supplies the location identifier using the keypad or touch screen. An exemplary touch screen numeric key pad is shown as 420 in FIG. 14. In that embodiment, the location identifier can be data that is easy to recall for the user, such as a zip code. In another embodiment, the location identifier is received automatically, from the vending controller 300. The vending controller in that embodiment is provided with data identifying its own location, such as an address, an intersection, a global positioning identifier or other coordinate data identifying its physical location. Alternatively, the each article dispensing machine may have a unique identifier associated with that machine. The central server may have a database stored on the central server memory that correlates a set of parameters associated with the unique identifier for each dispensing machine, including the location of the machine. In this embodiment, the central processor may use the unique identifier for each machine to look up the parameters of the article dispensing machine, including its location, on the database.

Next, as shown in step 608, the user interface may optionally request that the user limit the geographic range of the search by inputting a location search parameter. For example, the user may request that the search be limited to locations within a 5 mile radius or a specific zip code. The kiosk then receives that user entered location search parameter in step 610.

Next, in step 612, optionally the location identifier and the search parameter may be transmitted from the vending controller 300 to the central server 302. In essence, the vending controller 300 requests of the central server 302 the location of identical replacement articles. In steps 614 and 616, the central server 302 queries the database 304 to determine the location of the identified identical replacement articles. A query is performed on the database 304 to determine a vending apparatus 230 inventory having an identical replacement article. The results of the query are then sorted according to their location, and are ranked according to the locations that are closest to the location identifier. For example, the first result will be the location of a vending apparatus 230 that is one block away, the second result will be the location of a vending apparatus 230 that is 1 mile away, and so on. Further, optionally the system may be configured to transmit any predetermined number of locations. For example, the system may transmit to the user only one recommended location having the requested vendible media product, or the system may suggest any number of locations having the product, wherein the suggestions are

14

ranked in order of proximity to the location identifier. Alternatively, the locations of a certain number of vending apparatuses within a certain distance may be displayed to the user and an indicator may identify to the user which of those locations has the identical replacement article in stock.

In step 618, the location of a vending kiosk 230 or locations of multiple kiosks having the requested vendible media product in their vending inventory is received by the vending kiosk 230 at the first location from the central server. In step 620, the location or locations can be displayed on the touch sensitive display 234 at the vending apparatus 230. Then, in step 622, the system generates an interface at the first location from which the user can reserve the identical replacement article, located at the second location. Thus, the user interface at the first vending apparatus 230 allows the user to reserve the identical replacement article from the inventory at a second, remotely located vending apparatus 330. The user reserves the identical replacement article via the user interface at the first vending location, and the transaction data is transmitted to the central server 302, and then to a vending controller 300 at the second remote vending location which reserves the article for pick up by the customer as shown in step 624. The user interface then provides the customer instructions for retrieving the reserved article at the remote kiosk, as shown in step 626.

Then, at the remote vending location, the vending controller 300 receives user identification, such as a credit card or identification card passed through the card reader 240 or, alternatively, a PIN provided by the user using the keypad 242. When the vending controller 300 at the second vending location has confirmed the identity of the user, the vending controller 300 generates a signal to deliver the identical replacement article to the user at the second vending location.

If the search for remote vending machines having an identical replacement article, step 614, within the user designated search parameters does not result in any available locations, optionally the user interface may offer the customer the option to modify the location search parameters, as shown in step 628. If the customer opts to modify the search parameters, a new search is conducted using the modified parameters. If the customer opts not to modify the search parameters, the customer may be given the option to select a non-identical replacement article, as shown in steps 630, 632.

In another aspect of certain embodiments shown in FIG. 10 as process 700, an article vending machine may be configured to automatically dispense all of the disks that have been identified as inoperable to a service person. The vending machine is configured to receive a command from an authorized service person instructing the vending machine to dispense all of the disks that have been designated as inoperable step 702. The processor references the inventory database to identify each disk that has been identified as inoperable, step 704. The transfer mechanism 256 then removes the inoperable disks from their storage slots one at a time and vends each disk from the receptacle, step 706. The inventory database is updated to reflect that the vended inoperable disks have been removed from the article vending machine, step 708.

Any process descriptions or blocks in figures represented in the figures should be understood as representing modules, segments, or portions of code which include one or more executable instructions for implementing specific logical functions or steps in the process, and alternate implementations are included within the scope of the embodiments of the present invention in which functions may be executed

15

out of order from that shown or discussed, including substantially concurrently or in reverse order, depending on the functionality involved, as would be understood by those having ordinary skill in the art.

While the specific embodiments have been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention, and the scope of protection is only limited by the scope of the accompanying Claims.

What is claimed is:

1. A method for receiving an inoperable article via an article vending machine and providing an exchange of the inoperable article for a replacement article, the article vending machine having a user interface, a processor, a receptacle, a selector arm, and an inventory of articles housed in the article vending machine, the method comprising the steps of:

receiving a command through the user interface requesting to initiate a return of an inoperable article;
receiving the inoperable article via the receptacle;
engaging the inoperable article at a first position proximate to the receptacle,
using the selector arm;

transferring the inoperable article, using the selector arm, from the first position to a second position within the article vending machine;

disengaging the inoperable article at the second position;
identifying a customer associated with the inoperable article using program code operating with the processor;

determining if the customer is eligible to receive the exchange of the inoperable article for the replacement article using the program code;

in response to determining that the customer is eligible for the exchange,

determining if the inventory contains the replacement article that is identical to the inoperable article, using the program code, wherein the determining if the inventory contains a replacement includes:

accessing a database comprising identifying information for each article included in the inventory, and
comparing identifying information of the inoperable article with the identifying information of the articles included in the inventory to find a replacement article that has the same identifying information as the inoperable article;

in response to determining that the inventory does contain an identical replacement article:

transmitting to the user interface an option to receive the identical replacement article, and

receiving a selection of at least one of the option to receive the identical replacement article or the option to receive a refund

receive a request from a service person via the user interface to purge all inoperable articles, and in response to the request to purge:

access the database to identify each article identified as inoperable; and

provide for removal, from the second position, each of the identified inoperable articles.

2. The method of claim 1, wherein the article vending machine is networked to a plurality of remote vending machines each having an inventory of articles, the method further comprising the steps of, in response to determining that the inventory of the article vending machine does not contain an identical replacement article:

16

determining which remote vending machines comprise an identical replacement article within the respective remote vending machine inventories;

transmitting a list of remote vending machines having identical replacement articles to the user interface;

transmitting, to the user interface, an option to reserve the identical replacement article at one of the remote vending machines; and

receiving a selection of at least one of the option to reserve the identical replacement article.

3. The method of claim 2 further comprising the step of transmitting to the user interface an option to reserve the identical replacement article at one of the remote vending machines.

4. The method of claim 1, further comprising the step of, in response to determining that the article vending machine inventory does not contain a replacement article:

transmitting to the user interface an option to receive a non-identical replacement article and an alternative option to receive a refund for the cost of the rental of the inoperable article; and,

receiving a selection of at least one of the option to receive a non-identical replacement article or the option to receive a refund.

5. The method of claim 2 further comprising the step of transmitting to the user interface an option to receive refund for the cost of the rental of the inoperable article if the article vending machine inventory does not contain an identical replacement article.

6. The method of claim 1, wherein the determination of whether a customer is eligible to receive an exchange is based, at least in part, on at least one customer criterion selected from the group consisting of number of returned inoperable articles, frequency of returns of inoperable articles, percentage of transactions resulting in an returns of an inoperable article, and time of last return of an inoperable article.

7. The method of claim 1, wherein the determination of whether a customer is eligible to receive an exchange for the inoperable article is based on whether the customer is listed on an inoperable article refund blacklist.

8. The method of claim 1, further comprising the steps of: reading an article identifier from the inoperable article; and

referencing a database to obtain identifying information for the returned article based on the article identifier, using program code operating with the processor.

9. The method of claim 1, further comprising the step of identifying a database entry for the inoperable article in the database using program code operating with the processor.

10. The method of claim 9, further comprising the step of modifying the database entry for the inoperable article to indicate that the corresponding article is inoperable.

11. The method of claim 10, further comprising the step of prohibiting rental of the inoperable article.

12. The article vending machine of claim 1 wherein the article vending machine is networked to a plurality of remote vending machines each having an inventory of articles.

13. The article vending machine of claim 12, wherein the program code is further configured to, in response to determining that the inventory does not contain an identical replacement article:

determine which of the remote vending machines have in their inventories an identical replacement article,
provide a list of the remote vending machines having identical replacement articles to the user interface,

17

provide, to the user interface, an option to reserve one of the identical replacement articles at one of the remote vending machines on the list of the remote vending machines having identical replacement articles;

provide, to the user interface, an alternative option to receive a refund for the cost of the rental of the inoperable article; and

receive a selection of at least one of the option to reserve one of the identical replacement articles or the option to receive a refund.

14. The article vending machine of claim 13 wherein the program code is further configured to permit a user to reserve one of the identical replacement articles at one of the remote vending machines on the list of the remote vending machines having identical replacement articles.

15. The article vending machine of claim 1, wherein the program code is further configured to, in response to determining that the inventory does not contain an identical replacement article:

transmit to the user interface an option to receive a non-identical replacement article,

provide, to the user interface, an alternative option to receive a refund for the cost of the rental of the inoperable article; and

receive a selection of at least one of the option to receive non-identical replacement article or the option to receive a refund.

16. The article vending machine of claim 1, wherein the program code is further configured to, in response to determining that the inventory does not contain an identical replacement article:

provide, via the user interface, an option to receive a coupon for a rental article,

provide, via the user interface, an alternative option to receive a refund for the cost of the rental of the inoperable article, and

receive a selection of at least one of the option to receive a coupon and the option to receive a refund.

17. An article vending machine comprising:

an inventory comprised of a plurality of articles;

a receptacle for receiving an inoperable article;

a selector arm for transferring articles within the article vending machine, the selector arm being configured to: engage the inoperable article at a first position proximate to the receptacle,

transfer the inoperable article from the first position to a second position within the article vending machine, and disengage the inoperable article at the second position; and

a user interface configured to receive a request to initiate an exchange of the inoperable article for a replacement article;

18

a memory configured to store one or more databases, the one or more databases including a list of the articles that comprise the inventory of the article vending machine; and

a processor configured using program code to: identify a customer associated with the inoperable article;

determine if the customer is eligible to receive an exchange of the inoperable article for the replacement article;

in response to determining that the customer is eligible for the exchange,

determine if the inventory of the article vending machine contains a replacement article that is identical to the inoperable article by:

accessing the one or more databases to obtain identifying information for each article included in the inventory of the article vending machine, and

comparing identifying information of the inoperable article with the identifying information of the articles included in the inventory to find a replacement article that has the same identifying information as the inoperable article;

in response to determining that the inventory does contain an identical replacement article:

offer, via the user interface, an option to receive the identical replacement article; and

receive a selection of the option to receive the identical replacement article;

receive a request from a service person via the user interface to purge all inoperable articles, and in response to the request to purge:

access the database to identify each article identified as inoperable; and

provide for removal, from the second position, each of the identified inoperable articles.

18. The article vending machine of claim 17, wherein the articles are automatically dispensed via the receptacle in response to the request from the service person to purge all of the articles identified as inoperable in the database.

19. The article vending machine of claim 17, wherein the selector arm includes a picker device that is configured, in response to receiving the request to purge, to engage each inoperable article in the second position within the article vending machine, and to continue engaging the inoperable article while the selector arm transfers the article from the second position to the receptacle.

20. The article vending machine of claim 17, wherein the selector arm includes a conveying device that is configured to dispense the inoperable articles through the receptacle by transferring the inoperable articles towards the receptacle.

* * * * *