



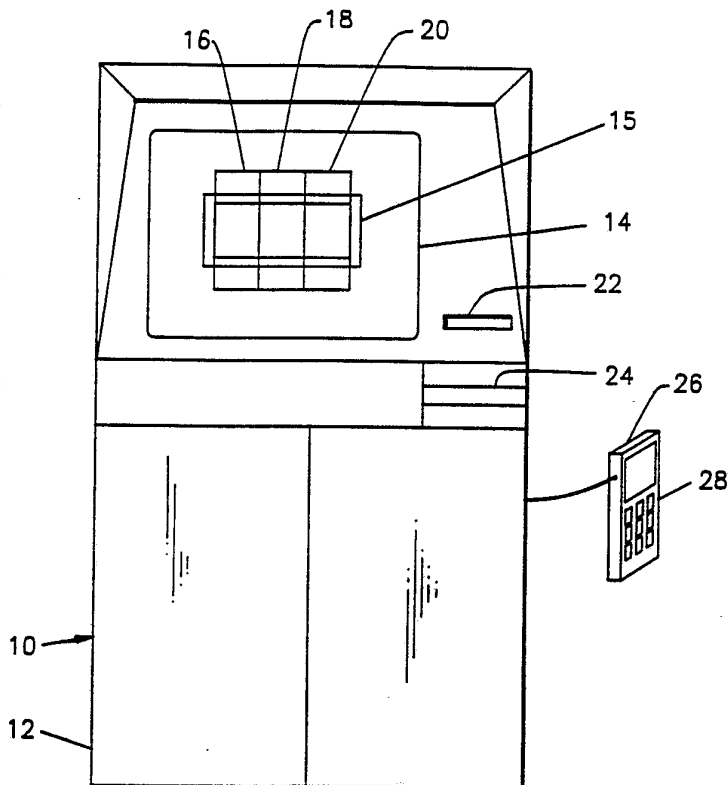
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(54) Title: A PROMOTIONAL GAME METHOD AND APPARATUS THEREFOR

(57) Abstract

A patron inserts a coded game card (32, 38) into a game machine (10) which reads the code and determines whether the game card has been played within a designated time period. If the game card has been played within such period, the game machine is not permitted to operate and a message will be generated. If the card has not been played within the time period, the game machine operates and randomly positions a number of product and/or service representations (17) with respect to one another. Prescribed combinations of the representations permit the patron to win a prize. Symbols (19), which may include symbols representing a business identity, may optionally be employed as wild cards in forming the prescribed combinations. In addition to bearing a unique game card code, the game card can also contain establishment codes which permit a game card to be played only at particular establishments. Other game cards can be specially coded to provide maintenance instructions to the game machine.



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DESCRIPTIONA PROMOTIONAL GAME METHOD AND APPARATUS THEREFOR

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10 The present application is a continuation-in-part application of application Serial No. 07/821,988 filed on January 16, 1992.

Technical Field

15 The present invention relates to games and, more particularly, relates to games in which prizes are awarded. Still more particularly, the present invention relates to games in which the prizes awarded are the products displayed as a result of playing the game.

Background Art

20 It is customary for all types of businesses to promote their products and services by offering those products and services at more attractive prices. Such promotions typically involve the use of coupons, such as buy one-get one free coupons, coupons redeemable for
25 products or services at reduced prices or for free, rebate coupons, etc. These promotional techniques are, at best, only marginally effective at promoting the goods and services of businesses and, accordingly, the extraordinary expense in conducting these promotions is
30 hardly justified. Thus, in promotions employing coupons, the coupons are typically distributed through newspapers, magazines and mass mailings to households, and therefore mostly reach consumers who are totally disinterested in the particular product or service being
35 promoted. Of those consumers that may potentially be interested in the particular product or service, many cannot be bothered or do not remember to clip the coupon from the newspaper or magazine and bring it to a store

for redemption. Other consumers may collect the coupons, but fail to redeem same prior to their expiration dates. These burdens placed on consumers result in low coupon redemption rates and, hence, inefficient and ineffective promotional programs by businesses.

Other promotional techniques which are frequently employed by businesses are similarly inefficient in that they are not targeted to narrowly defined groups of potential customers. Accordingly, these promotional schemes, which include contests, sweepstakes, free product giveaways, etc., suffer from drawbacks similar to those encountered when using coupons.

In order to overcome the poor results which have been obtained with these conventional promotional schemes, attempts have been made to devise programs which are targeted to more select groups of consumers. In one such system, shown in U.S. Patent No. 4,723,212 issued February 2, 1988, the purchase of certain products causes the generation of discount coupons which may be used to purchase different products from the ones originally purchased. Each item purchased is examined to see if a coupon is to be generated, and when all items have been examined and the maximum number of coupons determined, a suitable number of discount coupons are printed and issued. The patron does not take part in the process other than to select the original products for purchase. There is no display of the manufacturer's products, and the prizes awarded, if any, are intentionally different from the ones the patron has selected.

Other attempts have been made to develop promotional schemes which will be of more interest to potential customers. Typically, such schemes center around the playing of a game. In one system, described in U.S. Patent No. 5,007,641 issued April 16, 1991, a number of tokens having the same common code are

distributed to patrons by an establishment or packaged with the product line to be promoted. The tokens must be brought by the patron to the establishment and played in the game device. Certain of the tokens result in the award of a prize which must be claimed at a redemption booth. The system itself does not display the manufacturer's products and therefore neither improves the patron's memory of such products nor triggers a desire to purchase such products. Moreover, the prizes awarded bear no resemblance to the code shown on the token or the game display.

A further known device, disclosed in U.S. Patent No. 4,982,346 issued January 1, 1991, shows visual advertisements of various products and dispenses coupons if the patron wins. The win is determined by matching the number on a readable card with a pre-selected set of winning numbers in the device. Again, the actual prize won is not shown by the device and bears no direct relationship to what is shown.

Thus, despite the considerable effort that has gone into the development of many different promotional systems, there remains a need for a more effective system which will attract the attention of potential customers and which can acquaint these customers with the products and/or services being promoted by a business. Preferably, this system can be operated within a business establishment where it can be targeted to a more select group of potential customers.

Summary of the Invention

One aspect of the invention provides a promotional gaming method which includes the step of establishing at least two separate series of representations, including representations of products, services or both on a game machine. Most preferably, at least some of these representations are present in two or more of these series. Alternatively or additionally, the series may include "wild card" symbols. The method further includes the step of, upon play by a patron,

randomly placing the series with respect to one another and with respect to a fixed reference location on the game machine. One representation of a product or service on a first series may at times be aligned with one representation of the product or service on the other series to form a winning combination. Where "wild card" symbols are present, a winning combination may be formed by a product or service representation and a wild card symbol. The method further includes the step of awarding a prize to the patrons who form such a winning combination. Most preferably, the prize is a product or service which is related in some way to the products or services in the winning combination. The patron will naturally focus his or her attention on the displayed representations to see if a winning combination is formed. Because product or service representations are displayed, the promotional game according to this aspect of the invention will focus the patron's attention directly on the product or service representations. The patron cannot play the game without becoming conscious of a product or service being promoted. Moreover, the game is enjoyable and induces patrons to play.

In preferred methods according to this aspect of the invention, each patron who wishes to play the promotional game in an effort to win prizes obtains a game card by registering at a suitable service desk. Certain identifying information about the patron is recorded and a uniquely coded game card is issued to such patron and cross-referenced against his identifying information. The game card desirably also includes a code identifying the establishment in which the game card can be played.

In these preferred methods, the patron takes his game card and inserts it into a game machine to initiate play. In highly preferred methods, the establishment code is first checked to determine whether the game card is entitled to be played on that game machine. The unique code of the game card identifying

the patron is then checked against the stored codes of game cards played within a prescribed period, such as 24 hours, and if it is found already stored, signifying that it has initiated play within the last 24 hour
5 period, the game machine is locked out and the date and time of the previous play and an appropriate message are displayed on a visual display of the game machine.

In the event no match is found with stored codes, the random selection device is operated and a
10 visual display of the peripheral surfaces of, for example, three adjacent wheels is shown by the game machine. On these peripheral surfaces are depicted a series of images representing products, services, manufacturer and other business symbols and other
15 indicia. Since the three wheels spin independently, various combinations of these images can be formed entirely at random, including certain combinations for which prizes can be awarded.

In highly preferred methods, the game machine
20 may display more than one image at a time on each of the wheels. Thus, for example, when the wheels stop moving there may be displayed an array of nine images consisting of three images on each of the three wheels. Although only three images will be compared to determine
25 whether there is a winning combination, the display of the additional six images increases the advertising effect. In a variant of this method, the additional six images may remain fixed and only the images in those positions which must be compared to determine whether
30 there is a winning combination will be moved randomly.

Another aspect of the invention provides a game machine for playing the promotional game. The game machine includes a display for establishing a reference point and at least two separate series of images, at
35 least one of which includes representations of products, services or a combination of products and services, the two series being independently movable with respect to one another and with respect to the reference location

so that an image in one of the series can be aligned at the reference location with an image in another of the series to form various combinations, select ones of which being winning combinations. The game machine further includes movement means for moving the series with respect to one another and means for signaling that one of the winning combinations has been formed. Also, means are provided for awarding a prize on the formation of a winning combination.

10 In preferred embodiments of the game machine, the code on a game card inserted into the game machine actuates the movement means. In highly preferred game machines, maintenance cards inserted into and read by the game machine instruct the game machine to perform
15 certain non-game functions.

The game machine can be used to display the fact that prizes have been awarded and between plays can display prescribed messages about the products and services being promoted, the manufacturer, the
20 establishment or the game itself. These messages can take several forms, including "still" advertisements, banners having messages scrolling across them and moving videos.

It is an object of this invention to provide a
25 promotional game machine which is simple to use and can be readily reprogrammed to change the products and/or services being promoted.

It is a further object of this invention to provide a game machine which can initiate the awarding
30 of prizes in accordance with the objects displayed and in amounts commensurate with the number and type of product, service or symbol images displayed.

It is yet another object of this invention to provide a game machine which can only be played by a
35 given patron a fixed number of times within a fixed time period.

Other objects and features of the invention will be pointed out in the following description and

claims and illustrated in the accompanying drawings which disclose, by way of example, the principles of the invention and the best modes which have been presently contemplated for carrying them out.

5 Brief Description of the Drawings

In the drawings in which similar elements are given similar reference characters:

FIG. 1 is a front view of a game machine constructed in accordance with one embodiment of the invention;

FIG. 2 is a top plan view of a first form of game card which can be employed with the game machine of FIG. 1;

FIG. 3 is a top plan view of another form of game card which can be employed with the game machine of FIG. 1;

FIG. 4 is a highly schematic front view of one possible display on the screen of the game machine of FIG. 1;

FIG. 5 is a highly schematic front view of another possible display on the screen of the game machine of FIG. 1;

FIG. 6 is a highly schematic front view of yet another possible display on the screen of the game machine of FIG. 1;

FIG. 7 is a top plan view of a coupon which may be issued by the game machine of FIG. 1;

FIG. 8 is a highly schematic front view of a screen at a location remote from the game machine of FIG. 1; and

FIGS. 9a and 9b together are a flow chart of the operation of the game machine of FIG. 1.

Best Mode of Carrying Out the Invention

Turning now to FIG. 1, there is shown one embodiment of a game machine 10 which may be installed in a store and played in accordance with the methods disclosed herein. Game machine 10 includes a cabinet 12 to house a computer and the peripheral electronic and

mechanical devices (not shown) required to operate and perform the various functions of the game machine. In the upper portion of cabinet 12 is a video screen 14 which may be a TV monitor or the like. Optionally, video screen 14 may be positioned in a location remote from cabinet 12, such as at an elevated level which can be more readily seen by patrons throughout the store. The video screen 14 displays computer-generated representations of the peripheral surfaces of three adjacent wheels 16, 18 and 20 which can be rotated independently of one another in a random fashion so that the effect is the same as watching the display of mechanical slot machines. Screen 14 may also display a computer-generated or permanently marked indicia 15 at a preselected reference location. Rather than include depictions of lemons, cherries and other non-significant symbols, the wheels each carry a series of images 17 which represent products and/or services that a manufacturer, distributor or other business wishes to promote. As used herein, the term "products" does not refer to generic products, but rather refers to the brand-name products of one or more manufacturers or distributors. Also as used herein, the term "service representation" refers to a representation of a physical article, apparatus or other thing which is commonly identified with a particular service or which is useful in connection with performing the service. The wheels may also display trademarks, service marks or other symbols or logos 19 associated with the manufacturer, distributor or other business, which marks, symbols or logos may serve as wild cards. Alternatively, a store wishing to promote certain of its own products or services or the products or services of another business can place representations of those products or services on the wheels, as well as symbols identifying the store which may serve as wild cards. Further, the wheels may display images which partially represent the foregoing products, services and/or symbols so that upon the

alignment of select ones of these images, a complete representation of one or more of the products, services and/or symbols will be formed. The particular combinations of product and/or service representations for which prizes will be awarded, both with and without wild cards, are determined in advance and programmed into game machine 10, as will be discussed more fully below.

The game machine 10 is operated by the insertion of a game card, such as card 32 shown in FIG. 2 or card 38 shown in FIG. 3, into slot 22 of game machine 10. Game card 32 has a bar-code section 34 bearing a unique code which represents a particular patron and which thus identifies the game card. Preferably, the bar-code section 34 will also include a portion coded with information on the establishment or chain of establishments in which the game card 32 may be played. For example, each supermarket chain and each store in the chain may be identified by coded characters. The game machine 10 can then be set to operate only if it reads the code of the chain in which it is installed or, if special promotions in one or more stores are conducted, only those game cards 32 which contain the codes of the chain and those selected stores would operate the game machine 10. Similarly, game card 38 has a magnetic stripe 40 upon which has been recorded a similar unique code which represents a particular patron and which therefore identifies the game card, which code desirably also represents the establishment or chain of establishments in which game card 38 can be played. The name of the chain or the particular establishment at which the game card is valid may be printed upon the card itself, as at 36 on game card 32, or 42 on game card 38.

Located behind slot 22 is a suitable reader (not shown) for reading bar codes of the type contained on game card 32 or the magnetic stripe code of the type contained on game card 38. In this regard, any bar code

or magnetic stripe reader capable of supporting an RS232 interface at 9600 baud may be used. The data read by the reader will be used as set out below.

5 A further slot 24 is provided to dispense coupons representing the prizes awarded. Behind slot 24 may be a feeding mechanism (not shown) for dispensing pre-printed coupons stored in the game machine, or a printer (not shown) which first prints the required coupon on a roll of blank paper or partially pre-printed
10 forms on which may appear the store name, address, advertising information, etc., and which then feeds the completed, severed coupon through slot 24.

Referring to the flow chart of FIG. 9, the general method for operating the promotional game is set
15 out. First, a patron goes to a service desk or the like and requests a game card. The service desk personnel will take certain identification data from the patron which clearly identifies that patron only. The patron's name, address, social security number, driver's license
20 number and similar data can be used. Optionally, certain biographic information may also be taken, including the patron's sex, age, marital status, number of children, etc. The data is entered into input device 26 by depressing the keys of keypad 28. (See
25 FIG. 1.)

Next, the identification data is compared with like identification data stored in the input device 26 to determine if this identification data has been stored previously. If it matches previously stored
30 identification data, it means the patron already has been issued a game card 32 or 38, the fact of the match is shown by a suitable display, and no new game card is issued. In the absence of a match, a coded game card 32 or 38 is issued to the patron, and all of the entered
35 data is permanently stored in the input device 26. The number of the game card is permanently stored in input device 26 with the identification data of the patron so that the patron can be identified by his identification

data or game card number. In the event a game card is lost, the patron can report the loss to persons at the service desk who will enter additional data into the file of the patron in the input device 26 which will
5 render the lost game card invalid for play in game machine 10. A new game card 32 or 38 with a new code can then be issued to such patron. At prescribed intervals, the input device 26 may be connected by a suitable cable (see FIG. 1) to the game machine 10 to
10 upload the codes of the invalid game cards to a permanent memory location in game machine 10. Alternatively, a keyboard (not shown) may be temporarily connected to the game machine 10 to enter invalid game card codes directly into the permanent memory location
15 of game machine 10. In a preferred arrangement, the information regarding invalid game card codes may be downloaded onto a disk or other recordable media (not shown) which may then be inserted into game machine 10 and uploaded into the permanent memory location therein.
20 In any event, if any game card reported as lost is thereafter inserted for play, the game machine 10 will not be activated. A message may be displayed on video screen 14 or at the service desk to indicate that this is an invalid game card.

25 Once it has been issued to him, the patron may insert his game card into slot 22 of game machine 10 which reads the code in bar code section 34 on game card 32 or the code on magnetic stripe 40 of game card 38. The portion of the game card code bearing the
30 establishment information may first be compared by game machine 10 with establishment codes permanently stored therein to ascertain that the game card is being played in an establishment in which it is accepted. If the game card is not accepted by this particular
35 establishment, a suitable message to that effect will be displayed on video screen 14 and play will not be initiated. On the other hand, if the establishment information in the game card code is acceptable, the

random selection device in game machine 10 will be actuated automatically to initiate play.

As used throughout this specification, the term "random" refers to a movement of the wheels 16, 18 and 20 with respect to one another and with respect to reference location 15 which appears to be entirely random to the playing patron. As will be discussed more fully below, the movement of the images on the wheels may be truly random in that it is not influenced by any instructions from the software operating the game machine. It should be emphasized that this truly random movement of the images is the most preferred method for operating the game machine in accordance with the present invention. However, there is the possibility of programming the operating software of the game machine to control the movement of these images to some extent to assure that a winning combination is formed at prescribed times or at prescribed intervals. Although the influence of the software controlling the operation of the game machine may make the movement of the wheels with respect to one another less than truly random, such movements will still appear to be truly random to the playing patron. This latter possibility is a less preferred method of operating the game machine.

In order to more equitably distribute the prizes awarded, the establishment may desire to limit how often each game card may be played during a preselected period of time. The number of plays permitted within the preselected period of time may be limited to one or may be selected to be a number greater than one. For example, each game card may be limited to only one play during each twenty-four hour period, five plays in a one week period, etc. In order to accomplish this result, each time the insertion of a game card into slot 22 of game machine 10 actuates the random selection device of the game machine, the code on that game card is stored in a temporary memory location in game machine 10. Stored along with the game card code are

the date and time of play, as determined by an internal clock in game machine 10. If desired, the game machine 10 can also be programmed to store information regarding prizes won by the patron on that play, if any.

5 As the patron inserts his game card into slot 22 of game machine 10, the game machine can compare the game card code on that card with all of the game card codes previously stored in the temporary memory of game machine 10 to determine whether the random selection

10 device should be actuated. In the event game machine 10 determines that the game card code has not been played the maximum permissible number of times within the preselected period of time, the random selection device will be actuated and the patron's game card code, the

15 date and the time of play will again be stored together in the temporary memory location in game machine 10. Thus, a particular game card code may be stored as one or more entries in the temporary memory location, the date and time of play being stored along with each

20 entry. Should the game machine 10 determine that the game card code has already been played the maximum permissible number of times, the random selection device will not be actuated, and instead, the dates and times of each of the patron's plays may be displayed on video

25 screen 14 along with a video and/or audio message indicating that play has been denied.

The internal clock in game machine 10 can be used to periodically clear from the temporary memory location of the game machine the data regarding those

30 patrons who had played. Thus, the machine may check the date and time of play included with each game code entry, and may delete each entry having an "old" date and time, i.e., a date and time more than a preselected period before the checking and deletion cycle.

35 Therefore, at the end of the preselected period, each patron will be able to recommence his playing of the game machine. The clearing of the data stored in the temporary memory will not affect that information stored

in the permanent memory, such as the record of invalid game codes. Alternatively, the machine may simply clear all of the entries from the temporary memory at a selected time, such as at midnight each day or at the end of a week.

In a less preferred embodiment, all possible game card codes are permanently stored in game machine 10, and each time a particular game card is played a temporary notation is made within the game machine as to the date and time of play. The additional information provided by these notations is then used by the game machine to determine if that game card is entitled to be played at the time of presentation.

As set out above, the display during the operation of the random selection device in response to the insertion of a game card 32 or 38 is the peripheral surfaces of three wheels 16, 18 and 20 which move independently of one another in a random fashion until they stop at their final settings. In these final settings, one image on each wheel is displayed in alignment with the reference location 15. This alignment will typically be a linear arrangement in either a horizontal row, a vertical row or a diagonal row, alignment in a horizontal row being the most preferred. Although three wheels are described, it should be understood that game machine 10 may include at least two wheels or any number of wheels greater than two. The peripheral surfaces of the wheels are marked with the images of a series of products and/or services which are being promoted. These may include, for instance, a series of products of a particular manufacturer or distributor, the products and/or services of the establishment in which the game machine is installed, the products and/or services of a different establishment, or combinations of any or all of the above. In addition, images of symbols or logos identifying the manufacturer, the distributor, the establishment or another business, collectively referred

to herein as "business symbols", may be placed on the wheel surfaces to act as wild cards. No actual wheels exist, but these images result from the operation of the software within the game machine 10 in a well-known manner.

5 The software required to generate the product representations, service representations and business symbol images; to determine the particular combinations of images that will be awarded a prize; to determine the odds of forming these winning combinations; to display a particular message or series of messages; and to perform any other task in connection with the operation of game machine 10 is recorded on a disk or other storage media insertable in the game machine. The software, a preferred listing of which is shown in Appendix A attached hereto, may be run on any computer system running WINDOWS from Microsoft Corp. Version 3.1 or greater and capable of supporting the requisite peripheral equipment, preferred models of which are identified on the cover page of the attached software listing. By placing the game software on a removable disk, any of these parameters may be changed by merely replacing the storage disk with a new disk having the desired data. For example, the products whose representations appear upon the operation of game machine 10 can be changed merely by inserting a new disk having the proper information. Similarly, a new storage disk could be supplied to change the odds that a winning combination will be formed on any one play of game machine 10. To increase the odds that any one particular product or service representation will be part of a winning combination, the number of times representations or partial representations of that product or service appear on the wheels is increased. Similarly, the odds of forming a winning combination with a particular product or service representation can be decreased by decreasing the number of times

representations or partial representations of that product or service appear on the wheels.

Based upon the particular combination of images which are in alignment in reference location 15
5 at the end of the spinning of wheels 16, 18 and 20, a prize can be awarded. The criteria for determining which combinations will be awarded a prize can be selected from several different alternatives by an appropriate programing of the software which operates
10 game machine 10. In one method for forming a winning combination, the product and/or service representations on at least two wheels will match one another. Obviously, this method requires that the representations of at least some of the products or services appear on
15 at least two of the wheels so that matches can occur. For example, in game machines employing three wheels 16, 18 and 20, a winning combination may require that the product and/or service representations aligned in reference location 15 when all three wheels come to
20 rest be identical. This concept is illustrated in FIG. 4, in which wheels 16, 18 and 20 have each come to rest showing representations of cheese dip in horizontal alignment. Other winning combinations in accordance with this method may be formed through the use of
25 business symbols which serve as wild cards. Thus, as shown in FIG. 5, wheels 16 and 18 have come to rest displaying representations of cheese dip, while wheel 20 has come to rest displaying the manufacturer's logo. It will be appreciated that the use of business symbols as
30 wild cards eliminates the need to have the representations of at least some of the products or services appear on at least two of the wheels. This is particularly true in the case where only two wheels are used, where a winning combination may be formed by
35 matching a wild card symbol with a product or service representation. The extent to which the images on the wheels match may determine the magnitude of the prize awarded. Thus, at the option of the business employing

game machine 10 for promotional purposes, the concurrence of the three product representations in FIG. 4 may result in, for example, ten packages of cheese dip being awarded, while the combination of the matching product representations on wheels 16 and 18 with the manufacturer's logo on wheel 20 may result in an award of only three packages of cheese dip or cents-off coupons for this product.

A method which is similar to, but less preferred than that described above employs game machines in which the three wheels 16, 18 and 20 include partial representations of products and/or services. In accordance with this method, a winning combination desirably would require the proper alignment of all three wheels to form a complete representation of the product or service, as shown in FIG. 6. It will be readily apparent that for combinations in which less than all of the wheels in the game machine are appropriately aligned a complete representation of the product or service will not be formed and a win will not be produced. Although the use of business symbols as wild cards would prevent complete representations from being formed, the use of such wild cards are contemplated herein to increase the odds of forming a winning combination.

In an alternate method, a winning combination may be formed by aligning representations of a particular type of product or service on each of the wheels. For example, the three wheels of game machine 10 may include representations of cereal products offered by different manufacturers. A winning combination may then be formed by aligning three representations of cereal products offered by a single manufacturer. The representations of the cereal products may all be different, or some may match one another. The extent of the match (i.e., two or even three of the representations being identical) may be used to determine the magnitude of the prize awarded.

In another example, game machine 10 may be installed in a video rental store and wheels 16, 18 and 20 may include images of movie stars. The alignment of three images of one particular star, for instance Humphrey Bogart, may then be a winning combination entitling the winner to a free rental of a movie by that star, in this case a movie starring Humphrey Bogart. In a variant of this method, the winning combination does not require that the representations be of the same type of product or service; rather they merely must be related in some predetermined fashion. Thus, for example, were game machine 10 to be installed in a fast food restaurant, a winning combination may comprise aligned representations of a hamburger, french fries and a soda, or orange juice, coffee and an egg sandwich. Should game machine 10 be installed in an automotive parts store, a winning combination in accordance with this variant of operation may consist of aligned representations of cans of oil, an oil filter and an oil can spout. Since identical matches of product or service representations per se are not necessary, it will be apparent that the representation of any particular product or service need not appear on more than one wheel to operate the game machine in accordance with this method. Again, business symbols optionally may be used as wild cards in forming the winning combinations.

In yet another method, each play of the game machine will result in a winning combination and the award of a prize. In accordance with this method, the magnitude of the prize will depend upon whether the winning combination includes a match of two or more product or service representations. Thus, for example, in game machine 10, for a combination in which each of the product and/or service representations on wheels 16, 18 and 20 are different, the patron may win an award of a predetermined discount on the product or service appearing on wheel 16. If the product or service representation on either of wheels 18 and 20 match the

representation on wheel 16, the patron may be awarded two times or some other multiple of the predetermined discount on the product or service appearing on wheel 16. Matching the product or service representations on wheels 18 and 20 may also result in the award of, for example, twice the predetermined discount on the product or service appearing on wheel 16, or a similar discount on the product or service whose representations on wheels 18 and 20 match. Further, matching the product or service representations on all three of wheels 16, 18 and 20 may result in an award of that product or service for free or some other appropriate award. Of course, business symbols may also be used as wild cards in accordance with this method in order to enhance the opportunity for the patron to win a larger award. In a variant of this method, game machine 10 may include only a single wheel 16 and each patron may win an award related to the product or service appearing on wheel 16 after a random rotation. Preferably, the award will consist of the product or service free of charge or a predetermined discount on the product or service.

As is well known, regardless of the specific criteria used to determine winning combinations, the program controlling the random selection device of game machine 10 can be set to ensure that a given number of prizes are awarded per a given number of plays and to assure a given distribution of the prizes is achieved in concert with the desires of the business promoting its products or services. As an alternative to ensure that prizes are awarded regularly and in the desired value, the game machine may be programmed to form predetermined winning combinations a minimum number of times in a prescribed period if prizes have not been awarded or have not been awarded in sufficient numbers during that period by the random selection process. Thus, for example, game machine 10 may be programmed to form a certain winning combination at least once in a twenty-

four hour period to maintain patron interest. As to each patron the selection would be random. As emphasized above, programming game machine 10 so that the movement of wheels 16, 18 and 20 is influenced by the operating software of the game machine is less desirable than having the wheels move in a truly random fashion.

The game machine may be programmed in other ways to form predetermined winning combinations on a less random basis. Thus, for example, it may be desirable to maximize the promotional effect of the game by assuring that a winning combination is formed at a certain time or within a certain time period each day when the number of patrons in the establishment is at its greatest. Also, the game machine may be programmed to award a prize to a predetermined customer by forming a winning combination upon reading a preselected game code. Although these last two methods for controlling the formation of winning combinations may appear to be entirely random to the patron, the influence of the operating software for the game machine makes them less than truly random. Again, these are less preferred modes of operation.

Once it is determined that the display shows a winning combination, a signal is generated within game machine 10 instructing that a prize is to be awarded and what that prize is. This signal may be employed to dispense a pre-recorded coupon stored within the game machine or to cause the printing within the game machine of a coupon (see 60 in FIG. 6) redeemable for the product or service won in the quantity indicated. Alternatively, the signal may be directed to a display 70 at a service counter (see FIG. 7) where personnel at the counter may provide the required coupon or mark the actual product won so that it is free at the check-out counter. The signal may also be used to sound bells, flash lights, provide some audio message or cause a display on the video screen 14 of the game machine 10

to announce that the patron playing has won a prize and any other information desired to be disseminated.

The prizes awarded upon the formation of a winning combination may be totally unrelated to the products and/or services displayed on the game machine and may include, for example, monetary awards, store credits, coupons redeemable for any product or service offered by a manufacturer or other business entity promoting products or services on the game machine, coupons redeemable for a particular product or service offered by a manufacturer or other business entity not promoting its products or services on the game machine, etc. Preferably, the awarded prizes are products and/or services which are related to the products or services in the winning combination. As used herein, a prize "related to" a product or service A includes (1) one or more of the product or service A itself; (2) a discount on one or more of the product or service A; (3) one or more of a product or service which is typically used in combination or connection with the product or service A; and (4) a discount on one or more of a product or service which is typically used in combination or connection with product or service A. Most preferably, the prizes are those which are typically available in the establishment in which the game machine has been installed. In the case where the game machine has been installed in a mall, the prizes are preferably available from one of the stores in the mall.

As noted at the outset, the purpose of the promotional game method and apparatus of the present invention is to promote the products and/or services of one or more businesses. To that end, it is contemplated that the advertising affect of game machine 10 may be increased by displaying images representing products, services and/or business symbols on game machine 10 in addition to those images which are displayed in alignment with reference location 15 when wheels 16, 18 and 20 have stopped moving. Thus, for example, video

screen 14 may simultaneously display three images on each of wheels 16, 18 and 20 both as the wheels are moving and when they have come to rest. Although only one image on each of the wheels will be in alignment with reference location 15 and, hence, only those images will determine the existence of a winning combination, the display of the additional images will increase the promotional affect of game machine 10 because the patron's attention will be focused on the product representations, service representations and/or business symbols displayed in these additional images. The promotional affect can be increased still further by having the images which may be displayed on video screen 14 outside of reference location 15 remain fixed while wheels 16, 18 and 20 are being randomly moved with respect to one another. That is, only the images in reference location 15 would appear to move with respect to one another during play of the game, while the remaining images displayed on video screen 14 would remain in place. Naturally, the increased promotional affect of this latter embodiment would result from the patron's attention being focused on the still images during the entire random placement step.

Between operations of the random selection device, the video screen 14 of game machine 10 may also be used to display a series of messages promoting the products or services involved in the game, other information regarding the products or services, establishment messages, inducements to play the game and lists of the prizes awarded, and any other information to be called to the patrons' attention. Such messages may encompass a portion or the entirety of video screen 14, and may commence automatically a preselected length of time after operation of the random selection device has terminated and the wheels have come to rest. In a particularly preferred arrangement which enhances the advertising effect, a banner bearing an advertising message may be scrolled across the top portion of video

screen 14 without obscuring the combination of images aligned in reference location 15. The banner will appear a preselected period of time after play has terminated, which period of time may be increased or decreased as desired. A particularly beneficial advertising effect can be obtained by having the advertising banner appear promptly after the wheels have stopped moving so that the playing patron will see the banner and its advertisement while examining the images on video screen 14 to determine whether he is a winner.

In an equally preferred arrangement, at a predetermined time after the wheels have stopped moving, the product or service represented on one of the wheels will automatically grow in size to encompass all or substantially all of the video screen 14. For example, five seconds after the wheels have stopped moving (which should provide the patrons with sufficient time to note whether the combination of images formed on the screen is a winner) the image on the first wheel may gradually grow in size until it consumes a majority of video screen 14, obliterating the images of the other products, services or symbols displayed on the screen. When the image reaches its maximum size, an audible and/or visual message may be generated to promote the product or service appearing on the screen. Once this message has been completed and the enlarged image has been displayed for a preselected length of time, the video screen may revert to displaying the combination of images which resulted from the last play, or may display other advertisements or messages.

In yet another highly preferred embodiment, a moving video may be displayed on video screen 14 between plays of the game. These moving videos may be one or more advertisements, preferably for products or services whose representations appear during play of the game, or may be a demonstration on how the game is played, and may encompass the entirety of video screen 14 or any fraction thereof. The data for generating these moving

videos, which are much like the moving images typically viewed on a television, may be recorded on a storage disk in a known fashion for access by the operating program of game machine 10. As a result, the series of
5 moving videos in game machine 10 can be replaced with a new series of such videos merely by removing one storage disk from the game machine and inserting a new disk in its place.

In order to keep game machine 10 simple to
10 operate by patrons and simple to maintain by generally available store personnel, game machine 10 is not provided with a keyboard. Since no keyboard is available for instructing game machine 10 to perform
15 certain operations, all such instructions are supplied by inserting maintenance cards (not shown) into slot 22. In all outward appearances, the maintenance cards are the same as game cards 32 and 38, except that the coded information appearing in bar code sections 34 or
20 magnetic stripes 40 are not game card codes, but rather are instruction codes recognizable by the game machine. Thus, one maintenance card may contain a code for instructing game machine 10 to assemble various statistical data which may be obtained. Statistical
25 information regarding the patrons playing the game machine, their frequency of play, prizes won, etc., may be summarized in various tables to indicate, for example: (1) the total number of plays during the prescribed period, i.e., twenty-four hours, one week, etc.; (2) the number of plays hour-by-hour; (3) prizes
30 won and the profile of the persons who won; (4) the number of prizes won and the total value of the prizes awarded, etc. The code on the maintenance card may further instruct game machine 10 to print this statistical data either on the printer within the game
35 machine or at a remote location.

Another maintenance card may include a code for instructing the game machine to accept replays on some or all of the game cards, such as by reducing by

one the number of times each of the game card codes have been stored in the temporary memory of the game machine.

The code on yet another maintenance card may instruct the game machine to update and/or change the program in the game machine. Thus, as a storage disk containing new game parameters is placed in the game machine 10, the information thereon will not be uploaded into the operating memory of the game machine until the maintenance card bearing the proper instruction code has been inserted into the card reader via slot 22. The proper maintenance card will instruct the game machine to replace the game parameters in its operating memory with the game parameters on the newly inserted disk. Additional maintenance cards may be provided for instructing the game machine to perform other tasks, such as downloading or uploading card and play information to a remote computer. In less preferred embodiments, all of these instructions may be provided to game machine 10 through the use of input device 26 or some other keyboard temporarily connected to the game machine.

Games of this nature may be employed usefully at the point of sale in retail establishments such as supermarkets, fast food restaurants, auto parts stores, home centers, toy stores and the like. The ability to charge back to a sponsor, such as a manufacturer or distributor, the availability of recorded information regarding the total number of prizes won and the total value of prizes awarded as set forth above, the absence of any need for special goods packaging or specially distributed game cards, and the elimination of the need to distribute a plethora of coupons which will never be redeemed, all coupled with the ability to easily and quickly change promotions at will, provides a uniquely effective promotional tool.

As will be readily appreciated, laws bearing on gambling and the lotteries limit certain types of promotions involving an element of chance, particularly

where the purchase of goods or services is required as a pre-condition for entry into the game. Games according to the present invention can be, and are intended to be, operated in conformity with applicable laws. Such laws
5 ordinarily require that the patron or prospective patron be allowed to enter any game of chance without purchasing anything or paying money to acquire an entry. Ordinarily, such laws are satisfied if the patron has the opportunity to acquire a game card without a
10 purchase.

Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the
15 present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as set forth in the appended
20 claims.

Industrial Applicability

The game methods and apparatus of the present invention provide means for promoting goods and services which are more effective than previously-known
25 techniques.

CLAIMS:

1. A promotional gaming method for inducing potential customers to come to a particular establishment characterized by the steps of providing a game machine which can be played for no consideration; establishing at least two separate series of images on said game machine, at least one of said series including representations of products, services or a combination of products and services; upon play by a patron, randomly moving said at least two series with respect to one another so that an image in one of said series will be aligned at a reference point with an image in another one of said series to form one of various combinations, and wherein select ones of said various combinations are winning combinations; and awarding a prize to said patron if one of said winning combinations is formed upon play by said patron, said prize being selected from the group consisting of said products or services whose representations are in said winning combination, a product or service which is related to said products or services whose representations are in said winning combination, and a product or service which is available from said establishment.

2. A method according to claim 1 further characterized by the steps of distributing game cards to patrons, each one of said game cards being coded with a game card code to identify the game card and an establishment code to identify said establishment; and automatically reading said game cards when inserted into said game machine and initiating said random movement step responsive to said establishment code meeting predetermined criteria.

3. A method according to claim 1 further characterized by the steps of distributing game cards to patrons, each one of said game cards being coded with a game card code to identify the game card; and automatically reading said game cards when inserted into

said game machine and initiating said random movement step responsive to the reading of said game cards.

4. A method according to claims 2 or 3 characterized in that said game card code is read by
5 said game machine upon insertion of a game card into said game machine and is stored within said game machine for a selectable period of time.

5. A method according to claim 4
10 characterized in that said game card code of an inserted game card is compared with all previously stored game card codes and the initiation of said random movement step is prevented if said game card code of said inserted game card is found to have been stored a
15 selected number of times by said game machine within said selectable period of time.

6. A method according to claim 5
20 characterized in that when initiation of said random placement step is prevented, a display is made of each time said inserted game card was used within said selectable period of time.

7. A method according to any one of the
preceding claims, characterized in that said
establishing step includes the step of establishing said
25 at least two separate series of images so that said representations of at least one of said products or services are present in two of said series, and said winning combinations include a match formed by aligning
at said reference point a representation of a product or
service in one of said two series with a representation
30 of said product or service in another of said two series.

8. A method according to any one of the
preceding claims, characterized in that said
establishing step includes the step of establishing said
35 at least two separate series of images so that at least one of said series includes at least one wild card symbol consisting of a manufacturer symbol, and wherein

at least one of said winning combinations includes said at least one wild card symbol.

5 9. A method according to any one of the preceding claims, characterized in that said
establishing step includes the step of establishing at
least three separate series of images, at least one of
said series including at least one wild card symbol
consisting of a manufacturer symbol, said
representations of at least one of said products or
10 services being present in at least two of said series,
said winning combinations including a match formed by
aligning at said reference point a representation of a
product or service in one of said series with a
representation of said product or service in another of
15 said series, and at least one of said winning
combinations including said at least one wild card
symbol.

20 10. A method according to any one of the preceding claims, characterized in that said
establishing step includes the step of displaying a
visual representation of a peripheral surface of each of
at least two individual wheels in said game machine,
each of said wheels containing one of said series of
images, and wherein said step of randomly moving said at
25 least two series includes the step of causing said
individual wheels to rotate independently in said visual
representation with respect to one another and then stop
so that said various combinations of said images on said
at least two wheels can be read out at said reference
30 point.

35 11. A promotional gaming method for inducing potential customers to come to a particular establishment characterized by the steps of providing a game machine which can be played for no consideration; establishing at least two separate series of images on said game machine including partial representations of products, services or a combination of products and services; upon play by a patron, randomly moving said at

least two series with respect to one another so that an image in one of said series will be aligned at a reference point with an image in another one of said series to form one of various combinations, and wherein
5 select ones of said various combinations are winning combinations, select ones of said winning combinations including a match formed by aligning a partial representation of a product or service in each one of
10 said at least two series to display a complete representation of said product or service; and awarding a prize to said patron if one of said winning combinations is formed upon play by said patron, said prize being selected from the group consisting of said product or service whose partial representations form
15 said complete representation, a product or service which is related to said product or service whose partial representations form said complete representation, and a product or service which is available from said establishment.

20 12. A method according to claim 11 characterized in that said establishing step includes the step of establishing said at least two separate series of images so that at least one of said series includes at least one wild card symbol, and wherein at
25 least one of said winning combinations includes said at least one wild card symbol.

30 13. A promotional game apparatus for inducing potential customers to come to a particular establishment characterized by display means (14) for establishing a reference point (15) and at least two separate series (16, 18, 20) of images (17), at least one series including representations of products, services or a combination of products and services, said
35 at least two series being independently movable with respect to one another and with respect to said reference point so that an image in one of said series can be aligned at said reference point with an image in another one of said series to form various combinations,

select ones of said various combinations being winning combinations; movement means for moving said at least two series with respect to one another so as to form said various combinations randomly; activating means
5 which requires no consideration for activating said movement means; means for signaling that one of said winning combinations has been formed; and means (24) for awarding a prize upon the formation of said one of said winning combinations, said prize being selected from the
10 group consisting of said products or services whose representations are in said winning combination, a product or service which is related to said products or services whose representations are in said winning combination, and a product or service which is available
15 from said establishment.

14. The promotional game apparatus according to claim 13 characterized in that at least one of said series (16, 18, 20) includes at least one wild card symbol (19) consisting of a manufacturer symbol, and
20 wherein select ones of said winning combinations include said at least one wild card symbol.

15. A promotional game apparatus for inducing potential customers to come to a particular establishment characterized by display means (14) for
25 establishing a reference point (15) and at least two separate series (16, 18, 20) of images (17), at least one series including representations of products, services or a combination of products and services, said at least two series being independently movable with
30 respect to one another and with respect to said reference point so that an image in one of said series can be aligned at said reference point with an image in another one of said series to form various combinations, select ones of said various combinations being winning
35 combinations; movement means coupled to said display means for moving said at least two series independently with respect to one another so as to form said various combinations randomly; activating means which requires

no consideration for activating said movement means; reading means connected to said movement means for reading a code on a game card (32, 38) and for signaling said movement means to move said at least two series in response to said code; detection means for determining when one of said winning combinations has been formed at said reference point; and means (24) responsive to said detection means for indicating the award of a prize upon the formation of said one of said winning combinations, said prize being selected from the group consisting of said products or services whose representations are in said winning combination, a product or service which is related to said products or services whose representations are in said winning combination, and a product or service which is available from said establishment.

16. The promotional game apparatus according to claim 15 characterized in that said code includes a first portion comprising a game card code for identifying said game card and a second portion comprising an establishment code for identifying the establishment at which said game card may be used, and said reading means reads said first and second portions of said code and signals said movement means to move said at least two series randomly in response to predetermined establishment codes.

17. A method for operating a game machine characterized by the steps of establishing two types of operating cards, a first type of said operating cards each having a game code for actuating a game and a second type of said operating cards each having a maintenance code for actuating a non-game maintenance function; reading said operating cards when inserted into said game machine; and actuating said game machine to play said game responsive to the reading of an operating card of said first type and actuating said game machine to perform one of said non-game maintenance

functions responsive to the reading of an operating card of said second type.

18. A method according to claim 17 characterized in that said step of reading said operating cards includes the step of reading said operating cards of both said first and second types using a single card reader in said game machine.

19. A method according to claim 17 characterized in that said step of actuating said game machine to perform one of said non-game maintenance functions includes the step of transferring game-operating data from an external data source to an internal memory in the game machine only in response to the reading of said maintenance code on a selected one of said operating cards of said second type.

20. A method according to claims 17, 18 or 19 characterized in that said actuating step includes the step of actuating a non-game maintenance function which alters a feature of said game responsive to the reading of said maintenance code on a selected one of said operating cards of said second type.

21. A promotional game apparatus characterized by play means for playing a game; operating means for performing non-game maintenance functions in the game apparatus; a first group of operating cards (32, 38) coded with a game code; a second group of operating cards (32, 38) each coded with a different maintenance code, each one of said maintenance codes identifying a distinct maintenance function; and reading means for reading said game codes and said maintenance codes and for signaling said play means to play said game upon reading said game code on one of said first group of operating cards and for signaling said operating means to perform a selected one of said maintenance functions upon reading said maintenance code on one of said second group of operating cards.

22. A promotional game apparatus according to claim 21 characterized in that said play means comprises display means (14) for establishing a reference point (15) and at least two separate series of images (16, 18, 5 20), at least one series including representations of products, services or a combination of products and services, said at least two series being independently movable with respect to one another and with respect to said reference point so that an image in one of said 10 series can be aligned at said reference point with an image in another one of said series to form various combinations, select ones of said various combinations being winning combinations, and movement means for moving said at least two series with respect to one 15 another so as to form said various combinations randomly, whereby said reading means signals said movement means to move said at least two series upon reading said game codes; and said operating means comprises means for performing one of said maintenance 20 functions which alters a feature of said game responsive to the reading of said maintenance code on a selected one of said operating cards in said second group.

23. A promotional game apparatus according to claim 21 or 22 further characterized by internal storage 25 means; receiving means for receiving externally stored data; and transfer means for transferring said externally stored data from said receiving means to said internal storage means, wherein one of said maintenance codes signals said operating means to actuate said 30 transfer means.

AMENDED CLAIMS

[received by the International Bureau on 3 May 1993 (03.05.93);
original claims 1,6,11,13,15 and 17 amended;
other claims unchanged (5 pages)]

1. A promotional gaming method for inducing potential customers to come to a particular establishment characterized by the steps of providing a game machine which is played for no consideration; establishing at least two separate series of images on said game machine, at least one of said series including representations of products, services or a combination of products and services; upon play by a patron, randomly moving said at least two series with respect to one another so that an image in one of said series will be aligned at a reference point with an image in another one of said series to form one of various combinations, and wherein select ones of said various combinations are winning combinations; and awarding a prize to said patron if one of said winning combinations is formed upon play by said patron, said prize being selected from the group consisting of said products or services whose representations form said one of said winning combinations, a product or service which is related to said products or services whose representations form said one of said winning combinations, and a retail product or service which is available from said establishment.

2. A method according to claim 1 further characterized by the steps of distributing game cards to patrons, each one of said game cards being coded with a game card code to identify the game card and an establishment code to identify said establishment; and automatically reading said game cards when inserted into said game machine and initiating said random movement step responsive to said establishment code meeting predetermined criteria.

3. A method according to claim 1 further characterized by the steps of distributing game cards to patrons, each one of said game cards being coded with a game card code to identify the game card; and automatically reading said game cards when inserted into

said game machine and initiating said random movement step responsive to the reading of said game cards.

4. A method according to claims 2 or 3 characterized in that said game card code is read by
5 said game machine upon insertion of a game card into said game machine and is stored within said game machine for a selectable period of time.

5. A method according to claim 4 characterized in that said game card code of an inserted
10 game card is compared with all previously stored game card codes and the initiation of said random movement step is prevented if said game card code of said inserted game card is found to have been stored a selected number of times by said game machine within
15 said selectable period of time.

6. A method according to claim 5 characterized in that when initiation of said random movement step is prevented, a display is made of each time said inserted game card was used within said
20 selectable period of time.

7. A method according to any one of the preceding claims, characterized in that said establishing step includes the step of establishing said
25 at least two separate series of images so that said representations of at least one of said products or services are present in two of said series, and said winning combinations include a match formed by aligning at said reference point a representation of a product or service in one of said two series with a representation
30 of said product or service in another of said two series.

8. A method according to any one of the preceding claims, characterized in that said
35 establishing step includes the step of establishing said at least two separate series of images so that at least one of said series includes at least one wild card symbol consisting of a manufacturer symbol, and wherein

least two series with respect to one another so that an image in one of said series will be aligned at a reference point with an image in another one of said series to form one of various combinations, and wherein
5 select ones of said various combinations are winning combinations, select ones of said winning combinations including a match formed by aligning a partial representation of a product or service in each one of
10 said at least two series to display a complete representation of said product or service; and awarding a prize to said patron if one of said winning combinations is formed upon play by said patron, said prize being selected from the group consisting of said product or service whose partial representations form
15 said complete representation, a product or service which is related to said product or service whose partial representations form said complete representation, and a retail product or service which is available from said establishment.

20 12. A method according to claim 11 characterized in that said establishing step includes the step of establishing said at least two separate series of images so that at least one of said series includes at least one wild card symbol, and wherein at
25 least one of said winning combinations includes said at least one wild card symbol.

30 13. A promotional game apparatus for inducing potential customers to come to a particular establishment characterized by display means (14) for establishing a reference point (15) and at least two separate series (16, 18, 20) of images (17), at least one series including representations of products, services or a combination of products and services, said
35 at least two series being independently movable with respect to one another and with respect to said reference point so that an image in one of said series can be aligned at said reference point with an image in another one of said series to form various combinations,

select ones of said various combinations being winning combinations; movement means for moving said at least two series with respect to one another so as to form said various combinations randomly; activating means
5 which requires no consideration for activating said movement means; means for signaling that one of said winning combinations has been formed; and means (24) for awarding a prize upon the formation of said one of said winning combinations, said prize being selected from the
10 group consisting of said products or services whose representations form said one of said winning combinations, a product or service which is related to said products or services whose representations form said one of said winning combinations, and a retail
15 product or service which is available from said establishment.

14. The promotional game apparatus according to claim 13 characterized in that at least one of said series (16, 18, 20) includes at least one wild card
20 symbol (19) consisting of a manufacturer symbol, and wherein select ones of said winning combinations include said at least one wild card symbol.

15. A promotional game apparatus for inducing potential customers to come to a particular
25 establishment characterized by display means (14) for establishing a reference point (15) and at least two separate series (16, 18, 20) of images (17), at least one series including representations of products, services or a combination of products and services, said
30 at least two series being independently movable with respect to one another and with respect to said reference point so that an image in one of said series can be aligned at said reference point with an image in another one of said series to form various combinations,
35 select ones of said various combinations being winning combinations; movement means coupled to said display means for moving said at least two series independently with respect to one another so as to form said various combinations randomly; activating means which requires

no consideration for activating said movement means; reading means connected to said movement means for reading a code on a game card (32, 38) and for signaling said movement means to move said at least two series in response to said code; detection means for determining when one of said winning combinations has been formed at said reference point; and means (24) responsive to said detection means for indicating the award of a prize upon the formation of said one of said winning combinations, said prize being selected from the group consisting of said products or services whose representations form said one of said winning combinations, a product or service which is related to said products or services whose representations form said one of said winning combinations, and a retail product or service which is available from said establishment.

16. The promotional game apparatus according to claim 15 characterized in that said code includes a first portion comprising a game card code for identifying said game card and a second portion comprising an establishment code for identifying the establishment at which said game card may be used, and said reading means reads said first and second portions of said code and signals said movement means to move said at least two series randomly in response to predetermined establishment codes.

17. A method for operating a game machine characterized by the steps of establishing two types of operating cards, a first type of said operating cards each having a game code for playing a game and a second type of said operating cards each having a maintenance code for actuating a non-game maintenance function; reading said operating cards when inserted into said game machine; and actuating said game machine to play said game responsive to the reading of an operating card of said first type and actuating said game machine to perform one of said non-game maintenance

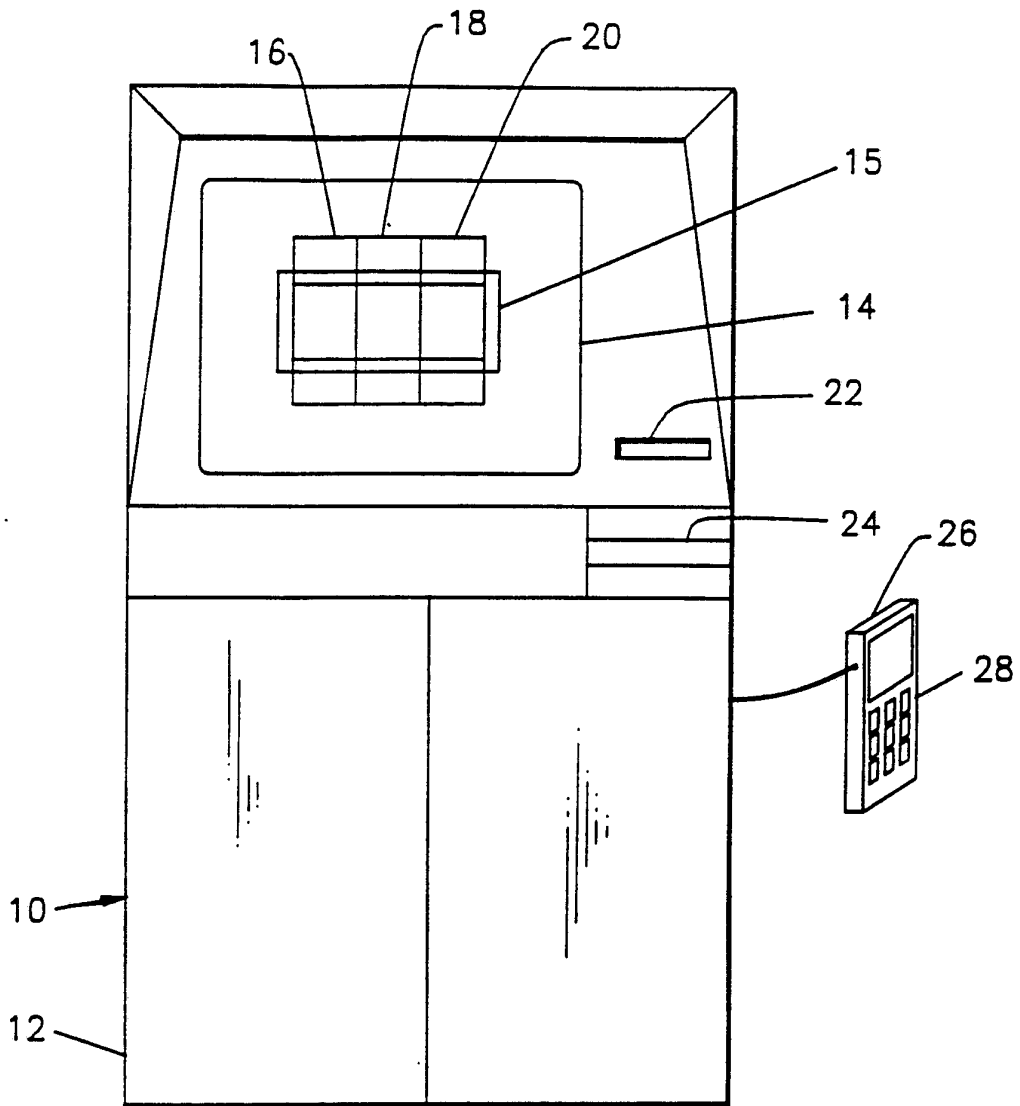


FIG. 1

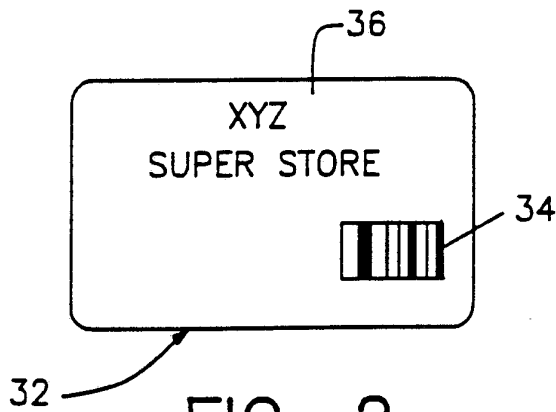


FIG. 2

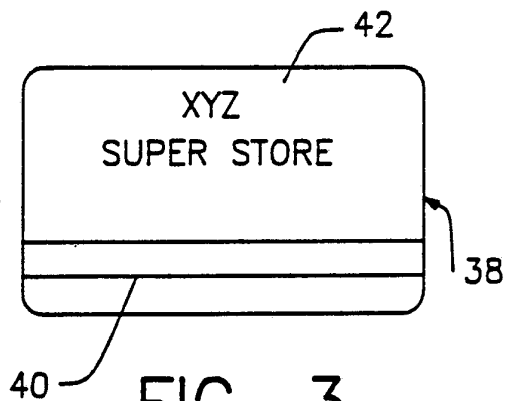


FIG. 3

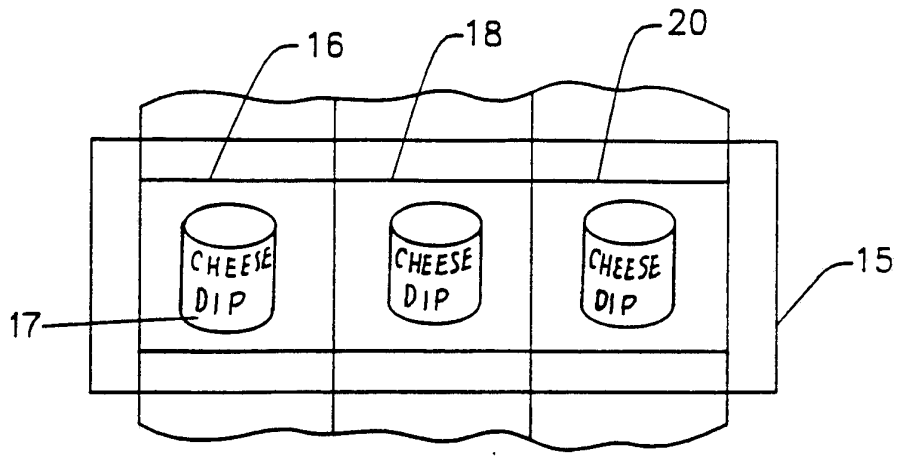


FIG. 4

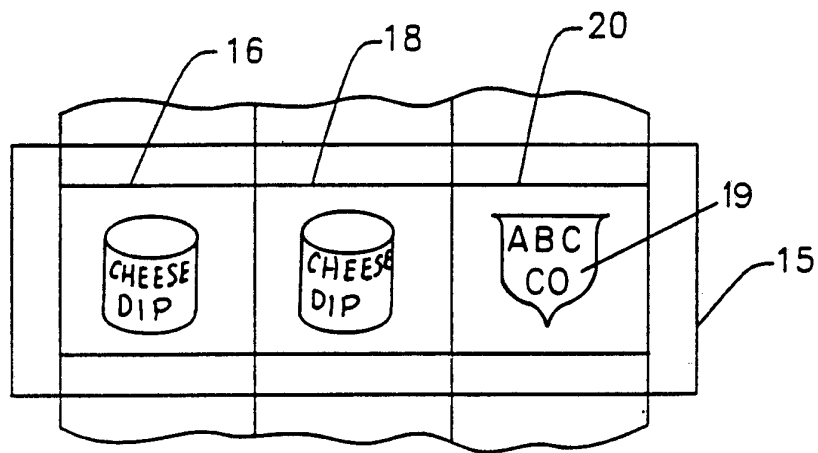


FIG. 5

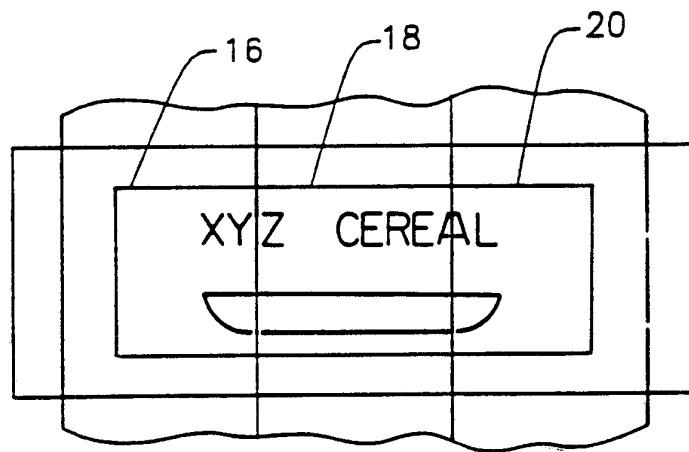


FIG. 6

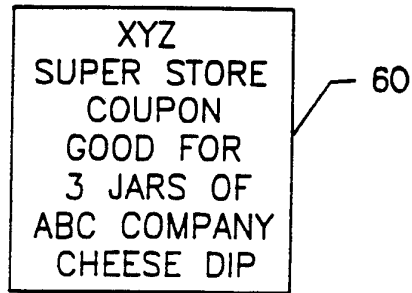


FIG. 7

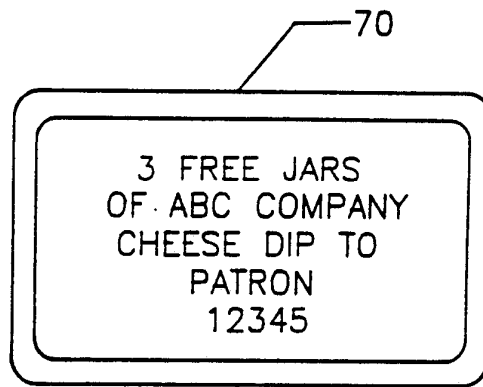


FIG. 8

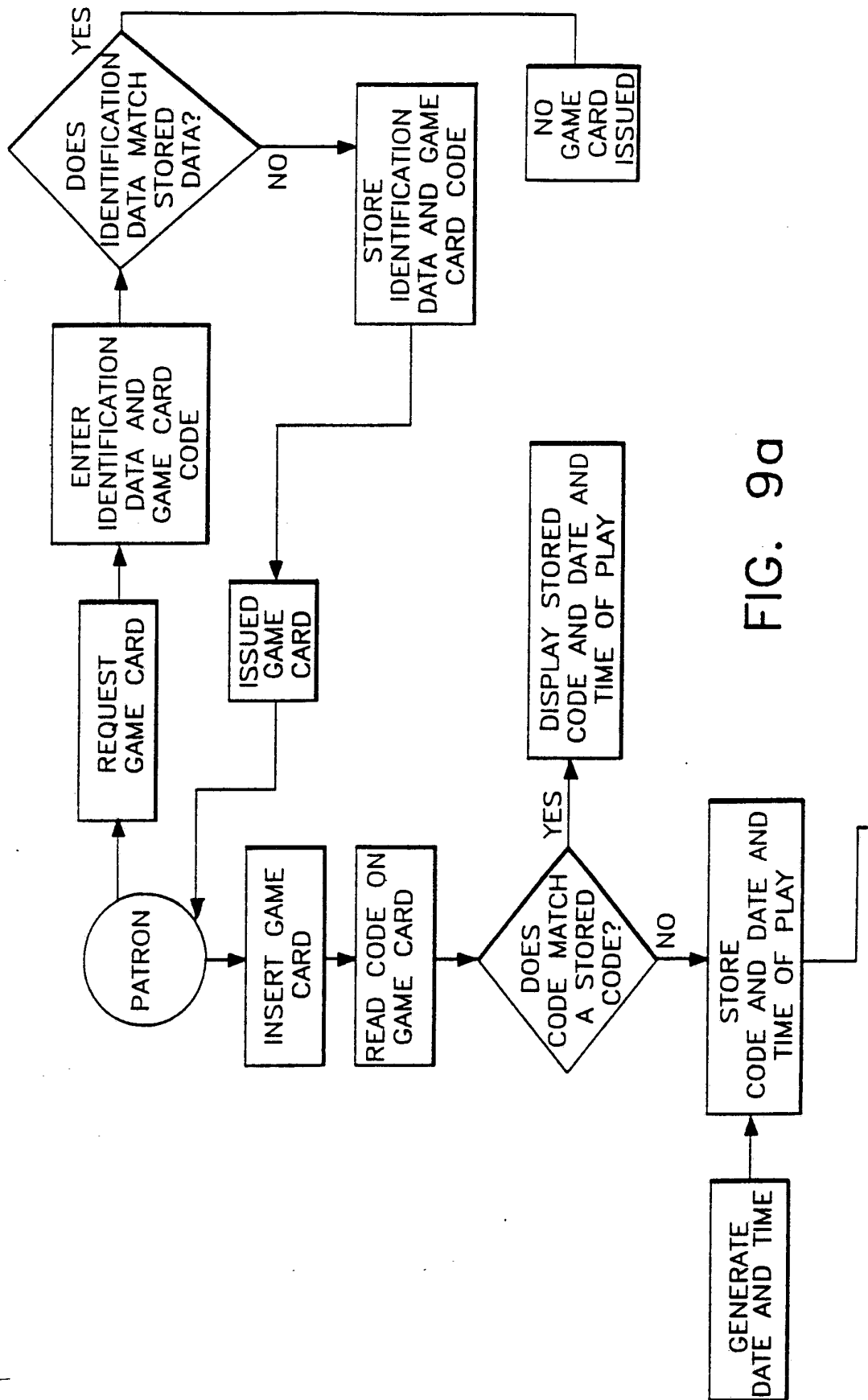


FIG. 9a

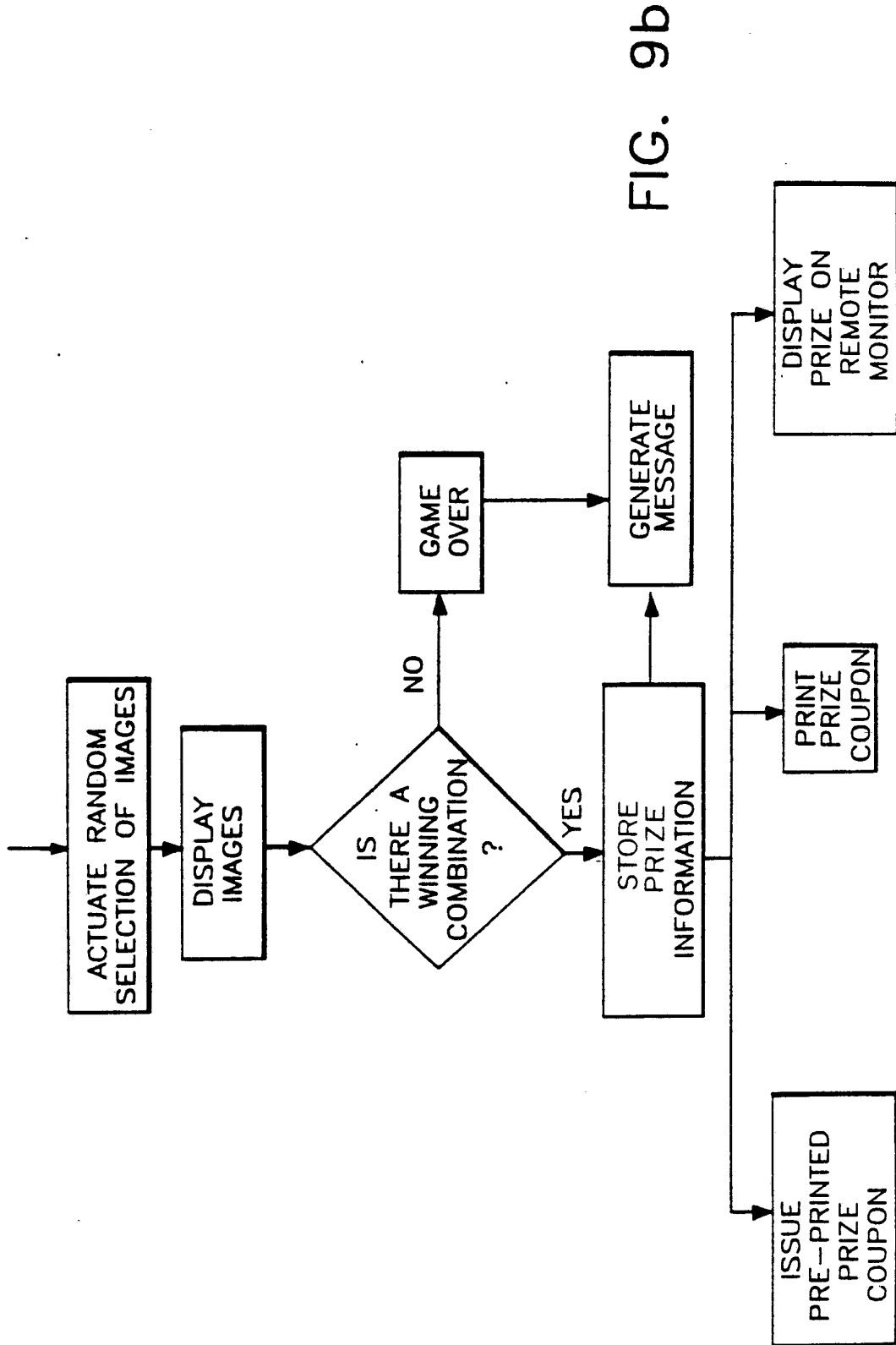


FIG. 9b

INTERNATIONAL SEARCH REPORT

PCT/US92/10519

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :G06F 15/20, G06F 15/44

US CL :364/401, 410; 273/138A; 235/380

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401, 410; 273/138A; 235/380; 346/41, 412; 235/375, 381; 285/51, 56, 901, 903, 102

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,648,600 (OLLIGES) 10 March 1987. See Figs. 1 and 4.	1-16
Y	US, A, 4,712,799 (FRALEY) 15 December 1987. See Figs. 1A, AB, 9 and 10.	1-16
Y	US, A, 4,072,930 (LUCERO ET AL.) 07 February 1978. See Figs. 1-7.	17-23
Y	US, A, 4,335,809 (WAIN) 22 June 1982. See Figs. 1.	2-6, 21-23
X	US, A, 4,573,081 (OKADA) 04 March 1986. See Figs. 1-7 and 9.	1-16

 Further documents are listed in the continuation of Box C.
 See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be part of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 16 February 1993	Date of mailing of the international search report 02 Feb 1993
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US92/10519

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,652,988 (KOZA ET AL.) 24 March 1987. See Figs. 1-6.	1-16, 21-23
Y	US, A, 4,882,473 (BERGERON ET AL.) 21 November 1989. See Figs. 1, 5, 6 and 7.	17-23
A	US, A, 5,002,213 (SALVATORE ET AL.) 28 March 1991. See Figs. 1-8.	1
Y	US, A, 5,033,744 (BRIDGEMAN ET AL.) 23 July 1991. See Figs. 2-4.	ALL
Y	US, A, 5,038,022 (LUCERO) 06 August 1991. See Figs. 2-4.	17-23
Y	US, A, 5,042,809 (RICHARDSON) 27 August 1991. See Figs. 1A and 1B.	1-16
Y, P	US, A, 5,083,271 (THACHER ET AL.) 21 January 1992. See Fig. 1, cols. 6, 7, 8 and 29.	17-23.