



SOFTWARE CONTROL SERVICES (PTY) LTD

475 King's Highway, Lynnwood
P.O.Box 36675, Menlo Park
Pretoria, South Africa
0102

(t) +27 12 348 7301
(f) +27 12 348 1129
(e) techsupport@softconserv.com
www.softconserv.com

Vending Machine.

Version 0. 1

Prepared by: Michael Davis- Hannibal

Softcon Software Control Services (Pty) Ltd.

7 March 2017



Revision History

Name	Date	Reason For Changes	Version
MDH	22-Oct-10	Initial document	0.1

Contents

1. General.....	3
2. Fonts and format	Error! Bookmark not defined.
3. Cover page.....	Error! Bookmark not defined.
4. Contents page	Error! Bookmark not defined.
5. Language	Error! Bookmark not defined.
6. Images.....	Error! Bookmark not defined.
7. Spelling and Grammar	Error! Bookmark not defined.
8. Document Management System.....	Error! Bookmark not defined.

1. General

A vending machine provides snacks, beverages, lottery tickets, and other products to consumers without a cashier. Items sold via these machines vary by country and region.

In some countries, merchants may sell alcoholic beverages such as beer through vending machines, while other countries do not allow this practice (usually because of dram shop laws).

2. History

The first recorded reference to a vending machine is found in the work of Hero of Alexandria, a first-century engineer and mathematician. His machine accepted a coin and then dispensed a fixed amount of holy water. When the coin was deposited, it fell upon a pan attached to a lever. The lever opened up a valve which let some water flow out. The pan continued to tilt with the weight of the coin until it fell off, at which point a counter-weight would snap the lever back up and turn off the valve.

Despite this early precedent, vending machines had to wait for the Industrial Age before they came to prominence. The first modern coin-operated vending machines were introduced in London, England in the early 1880s, dispensing post cards. The first vending machine in the U.S. was built in 1888 by the Thomas Adams Gum Company, selling gum on train platforms. The idea of adding simple games to these machines as a further incentive to buy came in 1897 when the Pulver Manufacturing Company added small figures which would move around whenever somebody bought some gum from their machines. This simple idea spawned a whole new type of mechanical device known as the "trade stimulators". The birth of slot machines and pinball is ultimately rooted in these early devices.

In December 1970 Ussery Industries of Dallas, Texas at its Dallas convention displayed its new "talking" vending machine, the Venda Talker. With insertion of a coin, the machine said "thank you" and added a one-liner voiced by comic Henny Youngman. The Venda Talker was featured on Johnny Carson's Tonight Show in March 1971.

3. Mechanism

After paying, a product may become available by:

- the machine releasing it, so that it falls in an open compartment at the bottom, or into a cup, either released first, or put in by the customer
- the unlocking of a door, drawer, turning of a knob, etc.

Some products need to be prepared to become available. For example, tickets are printed or magnetized on the spot, and coffee is freshly concocted. One of the most common form of vending machine, the snack machine, often uses a metal coil which when ordered rotates to release the product.

The main example of a vending machine giving access to all merchandise after paying for one item is a newspaper vending machine (also called vending box) found mainly in U.S. It contains a pile of identical newspapers. After a sale the door automatically returns to a locked position. A customer could open the box and take all of the newspapers or, for the benefit of other customers, leave all of the newspapers outside of the box, slowly return the door to an unlatched position, or block the door from fully closing, each of which are frequently discouraged, sometimes by a security clamp. The success of such machines is predicated on the assumption that the customer will be honest (hence the nickname "honor box"), and need only one copy.

4. Cigarette vending

Cigarettes were commonly sold in the United States through these machines, but this practice is increasingly rare due to concerns about underaged buyers. This is similar to the situation in the UK, where many machines in pubs and clubs have been removed as well. Sometimes a pass has to be inserted in the machine to prove one's age before a purchase can be made. In some countries like Germany and Japan, by contrast, cigarette machines are still common.

Since 2007, however, age verification has been mandatory in Germany - buyers must be 18 or over. The various machines installed in pubs and cafés, other publicly accessible buildings and on the street accept one or more of the following as proof of age: the buyer's identity card, bank debit card (smart card) or European Union driver's licence.

5. Full-line vending

A full-line vending company may set up several types of vending machines that sell a wide range of products. The types of products may include candy, cookies, chips, fresh fruit, milk, cold food, coffee, bottles, cans of soda, and even frozen products like ice cream. These products can be sold from various types of vending machines that include coffee, snack, cold food, 20-oz. bottle machines, and glass-front bottle machines. Almost all machines accept bills with more and more machines accepting \$5 bills. This is a great advantage to the vendor because it virtually eliminates the need for a bill changer. Larger corporations with cafeterias will often request full line vending with food service. Vending companies that offer both have a competitive advantage in acquiring accounts because it makes it much easier to deal with one company for both services.

6. Specialized vending

Some types of vending machines are those that dispense personal products, typically in public toilet facilities. The machines in ladies' restrooms typically sell some form of absorbent device for menstruation such as a pad or tampon. The machines in men's rooms, when they are present, are most commonly used for the sale of condoms, though in some locations they may be found dispensing cologne, medicine, small candies, or even pornography. These are often found at toilets used by transient persons in high traffic locations, such as bus stations, shopping centres, airports and service stations.

In the past, vending machines were used at American airports from the 1950s until well into the 1970s to sell life insurance policies covering death in the event that the buyer's flight crashed. Such policies were quite profitable, because the risk of any given flight crashing was (and remains) very low, but this practice gradually disappeared due to the tendency of American courts to strictly construe such policies against their sellers, such as Mutual of Omaha.

From 2000-2010, specialization of vending machines became more and more common. Vending extended increasingly into non-traditional areas like electronics. An example of this are the Best Buy Express ZoomShops that have become common in many airports and malls, and Coinstar change sorting machines located in grocery stores.. This new category of machines are generally called Automated Retail kiosks. The trend of specialization and proliferation of vending machines is perhaps most apparent in Japan where vending machines sell products from toilet paper to hot meals and pornography, and there is an estimated 1 vending machine per 23 people. Containers of live bait are frequently sold in vending machines in the rural United States.

7. Safety

Most modern vending machines have been extensively tested and designed to inhibit theft, with security measures resulting in designs similar in strength to safes. As a result, they can be very heavy. Every year, a small number of people are killed when machines topple over on them, either while trying to steal from them, or venting frustration on them, especially when a malfunction causes the machine to fail to dispense the purchased item or the proper change. An article in the *Journal of the American Medical Association* (11 November 1988, p. 2697) documents 15 cases in which men trying to get a can out of the machine were crushed. Three died, the other 12 required hospitalization for injuries such as fractures of the skull, toe, ankle, tibia, femur, and pelvis; intracerebral bleeding; knee contusion; and one punctured bladder. The article states that because the soft drinks are located in the upper half of the machine (so that they can fall into the dispensing slot), the centre of gravity of the machine is abnormally high, and the machine will fall after it has been tipped only 20 degrees, a deceptively small angle. A large, fully loaded soft drink machine can weigh over 400 kg (880 lbs.)

There is also an issue with vending machines, particularly mechanical vending machines, involving using a coin of a foreign currency which has the same size and shape as the coin accepted by the machine to get cheaper merchandise and some times change that might have more value than the originally inserted foreign coin. One remarkable example of this was the use of Libyan coins of 100 Dirhams and 50 Dirhams denominations in Maltese vending machines in the late 1990s. The 100 Dirham coin was used in place of the 1 Maltese Lira coin which had, back then, a de facto black market value of approximately 10 Libyan Dinars and thus having a staggering value 100 times higher than that of the fraudulent coin. Similarly, the 50 Dirhams coin was used in place of the 25 Maltese Cent which meant 50 folds increases of value according to the black market price.

However, the problem was quickly solved when the machines involved were quickly replaced with new ones that could detect the difference between the Libyan and the Maltese coins, especially in touristic areas. Most notably, the 2 euro coin is similar in size to the 10 baht coin (worth only €0.25). As a result, many vending machines in the eurozone will not accept €2 coins, such is the extent of the 10-baht scam. In the United States, most vending machines can discern coins by reading the coins' "magnetic signature;" thus, many American vending machines cannot take coins from Canada, Bermuda, or the East Caribbean, even though those coins are nearly identical in size to their American counterparts and occasionally trade at par at sums of less than \$1.

8. Innovations

Vending has gone through significant changes over the decades. Many machines are still evolving to become able take credit cards and companies are beginning to obtain the capability of monitoring a machine's state from afar.

John Greenwick of the Greenway company is a former Mars Electronics employee and former product manager of the first ever bill acceptor. According to him, the industry saw a need for the ability to standardize the acceptance of coins and currency on a global basis. As such, a standard known as MDB (Multi-Drop Bus) was invented. This allows for machines around the world to utilize the same bill acceptor and coin changer devices with an international specification. Thus, legacy machines may require conversion kits in order to avoid extinction.

Doug M. Sanford of Vending Times notes that "many vendors today do not remember the urgency with which industry leaders called on their peers to install coin mechanisms that held the patron's money in escrow until the vend was made; to post a telephone number that a customer could call to report a failure and request a refund; to make sure their drivers were cleaning the machines adequately and replacing burnt-out lamps; and so on and on". More recent innovations include improved coin and bill validation and the rapid adoption of sense-and-feedback systems to verify that the vend was made.

One of the newest vending innovations is telemetry. According to Michael Kasavana, National Automatic Merchandising Association Endowed Professor at The School for Hospitality Business, Michigan State University, the advent of reliable, affordable wireless technology has made telemetry practical and provided the medium through which cashless payments can be authenticated. This is

important because research shows that 50% of consumers will not make a purchase from a vending machine if its "use exact change only" light is on. Machines equipped with telemetry can transmit sales and inventory data to a route truck in the parking lot so that the driver knows exactly what products to bring in for restocking. Or the data can be transmitted to a remote headquarters for use in scheduling a route stop, detecting component failure or verifying collection information. Telemetry could be one of the most significant developments in vending technology since the invention of the bill changer.

Currently the Company Vendtxt Vending Inc. Based in Estevan, Saskatchewan, Canada has developed and deployed vending machines in Saskatchewan which allow customers to purchase products through the use of an SMS(text) message. The user sends a text to a short code and receives a text message back with a four digit numeric code. The user is then able to enter their code into the vending machine and make a selection. If their product is successfully delivered the customer's mobile phone account is charged the cost of their purchase.

Another innovation are ZoomShops, self-service, standalone Automated Retail stores. ZoomShops are developed and produced by Zoom Systems, based in San Francisco, CA. Over 1000 ZoomShops exist across the U.S., Europe and Japan. The typical ZoomShop experience allows the consumer to purchase products using a touch screen interface. Once a product is purchased the patented robotic arm delivers it into the pickup box and charges the consumer's credit card. ZoomShops include products from brands such as Apple, Best Buy, Body Shop, Macy's, Proactiv Solution and Sephora.

With consumers wanting quick and convenient access to competitively priced products, the vending industry has seen a great deal of growth over the last ten years. Vending offers new entrepreneurs a way to start businesses which can grow quickly. Snack, beverage, candy and food vending machines continue to be the most lucrative and stable in the market place. New innovations in service vending machines include internet kiosks and DVD vending. Cashless vending now allows consumers to use debit cards or precharged 'keys' such as the U-Key for added convenience. Vending is a multi-billion dollar industry, and is growing.

In order to prevent injuries or death from tipping or striking the machine, most modern snack vending machines equipped with spirals to hold products contain lasers near the access door at the bottom. If a purchased item does not break the laser beam when falling, the spirals will automatically turn, usually three times to ensure that a product will fall. If this still does not occur, the customer will be asked to make another selection or will be refunded their money.

Off-grid fuel cell based vending machines with swappable hydrogen storage tanks are entering the market.

9. References

- en.wikipedia.org