

Chapter 2b

Dating Milk Bottles, Part II

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Paper Milk Cartons

On several occasions, paper cartons challenged the supremacy of glass as containers for milk. Only the last was really successful. For a thorough discussion of the issues surrounding paper containers and a more complete list of patents, see the Dairy Antique Site (2011).

Early Paper Cartons – 1896-1915

Hervey D. Thatcher, noted for some of the earliest glass milk bottles, also applied for a patent for a waxed paper milk pail on June 24, 1895, and received Patent No. 553,794 on January 28, 1896 (Figure 2-39). Thatcher discussed many of the issues connected with glass milk bottles (including breakage as well as problems with sanitation and washing). He claimed that his “Paraffined Pail” would solve the problems with glass. Thatcher followed up with two other patents for refinements, Patent No. 619,019 for a “Paper Pail” on February 7, 1899, and Patent No. 688,365 for another “Paper Pail” on December 10, 1901. He never advanced beyond the “pail” design.

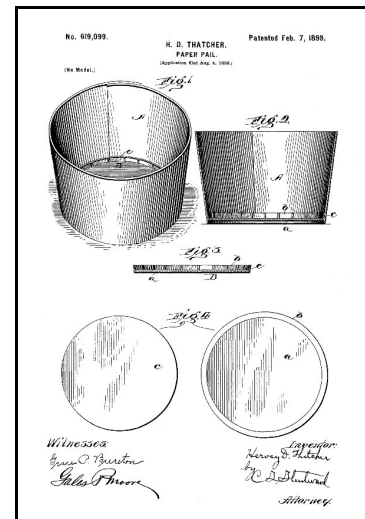


Figure 2-39 – Thatcher “Paraffined Pail”

Winslow (1907:140) noted that “the latest departure in the way of a milk bottle is the single service milk container of wood-paper made and invented by G.W. Maxwell of 2101 Folsom St., San Francisco. . . . now in actual use by dairymen in Los Angeles.” The “bottles” were shaped like “an ordinary drinking glass” and came in quart, pint, half-pint, and quarter-pint sizes. The paper cover was wedged into place and held by four tabs. Although Winslow gave Maxwell full credit for the invention, the actual patent document named George W. Maxwell and Alonzo Kingsbury as the inventors, although Kingsbury assigned his portion to Maxwell. The pair applied for the patent on July 3, 1905, and received Patent No. 827,924 for a “Milk Receptacle” on August 7, 1906 (Figure 2-40). The containers were dipped into paraffin to insure impermeability. Like the failed attempts to follow, Maxwell’s idea was ahead of its time.

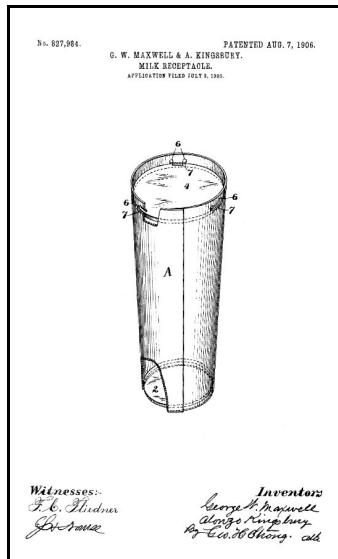


Figure 2-40 – Maxwell paper carton

Tuton (1994:28) apparently missed Maxwell's container, but he noted that the first square (cross section) waxed paper milk carton was patented on July 18, 1911. The inventor, John R. Van Wormer, applied for his patent on October 22, 1910, and received Patent No. 588,553 for a "Package for Liquids (Figure 2-41). The Dairy Antique Site (2011) noted that the lid for the carton was inserted prior to the introduction of the milk and floated to be grasped and pulled into place.

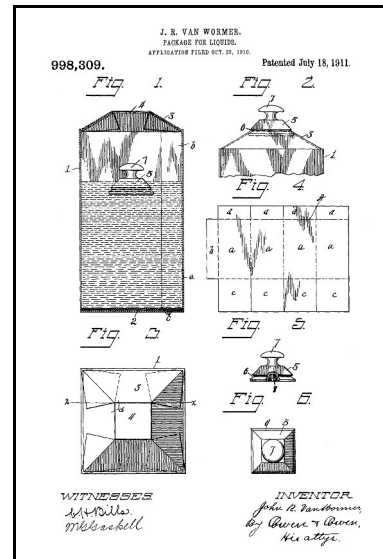


Figure 2-41 – Van Wormer's 1911 paper carton

Van Wormer continued to refine his containers, devising a very efficient top seal (Patent No. 1,123,628 on January 5, 1915) the was similar to the one that became popular in the 1930s. He further refined the design to include a pour spout (Patent No. 1,157,462) on October 19, 1915 (Figure 2-42). Van Wormer's 1932 patent (see below) would revolutionize the industry.

Cone-Shaped Cartons – 1914

Wilbur L. Wright applied for a patent on July 15, 1913, and received Patent No. 1,096,880 for a "Neck Formation for Paper Receptacles" on August 18, 1914. The Dairy Antique Site (2011) noted a second patent received on the same day, but I have not been able to find that one. However, both patents were certainly for cone-shaped waxed paper containers that were manufactured by the Purity Paper Vessels Co.

On March 30, 1915, Wright applied for another patent for a "Paper Receptacle and the Like" and received Patent No. 1,174,648 on March 7, 1916. This was for a cone-shaped bottle that was sealed with a disk (Figure 2-43). He assigned the patent to the Paper Vessels Co., Baltimore. He changed the name to

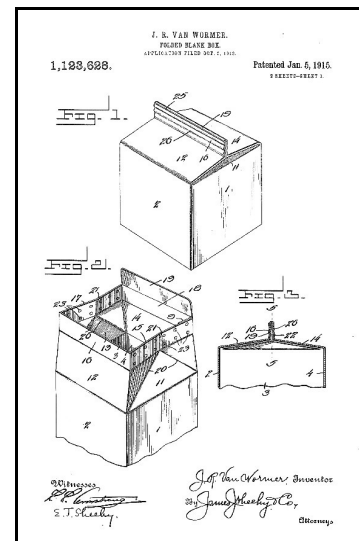


Figure 2-42 – Van Wormer's 1915 improvement – the pour spout

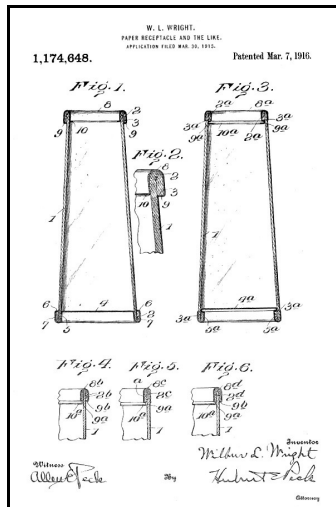


Figure 2-43 – Wilbur L. Wright's 1916 cone-shaped carton

“Paper Bottle and the Like” for Patent No. 1,251,727, received on January 1, 1918 – and assigned this one to the Seabright Co., Inc., Fulton, New York. Wright added still more improvements a decade later with his “Tapered Paper Container” – Patent No. 1,740,966 on December 24, 1929, assigned to the Oswego Falls Corp. at Fulton. His final conical offering, also assigned to the Oswego Falls Corp., while filed on June 21, 1929, was not received until February 21, 1933, when he was granted Patent No. 1,898,112 for a “Paper Bottle and Other Containers” (Figure 2-44).

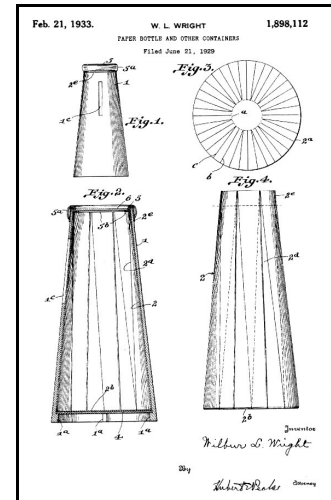


Figure 2-44 – Wright's 1933 cone-shaped carton

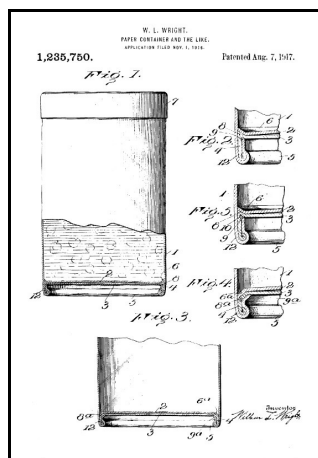


Figure 2-45 – Wright's 1917 patent of an ice cream carton

In addition to his paper milk bottles, Write patented several machines for use in paper vessel processing and milk bottle sealing, various disk seals for milk bottles, and paper cartons for ice cream, descendants of which are still in grocery store freezers in 2011. A few notable ones are:

Patent No. 1,235,750 – applied Nov. 1, 1916; received Aug. 7, 1917 – “Paper Container and the Like” – Although his intention was “to provide paper containers

with liquid tight end closures,” this looks very similar to round ice cream cartons (Figure 2-45).

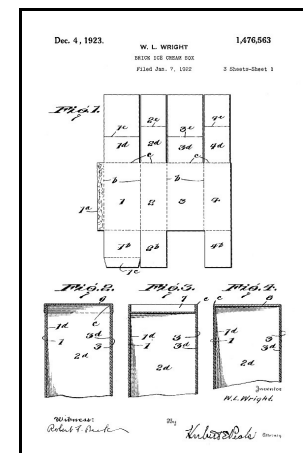


Figure 2-46 – Wright's 1923 “Brick Ice Cream Box.”

Patent No. 1,476,563 – applied Jan. 7, 1922; received Dec. 4, 1923 – “Brick Ice Cream Box” – Again, boxes of this type can be seen in grocery stores in 2011 (Figure 2-46).

Patent No. 1, 808,975 – applied Apr. 30, 1930; received June 9, 1931 – “Sheet Material Container for Bulk Ice Cream and Other Products” – This was another round ice cream box.

Patent No. 1,954,306 – applied March 29, 1932; received April 10, 1934 – “Paper Container” – This was Wright’s last patent for an ice cream carton.

Most of these cartons were not marked with individual dairy names. Cone-shaped containers were still in use until at least 1929 when *Science & Invention Magazine* prematurely announced that “the old fashioned glass milk bottle, used for over 40 years in dispensing milk, may soon be a thing of the past.” The article suggested that a combination of price and sanitation would drive the market to conical paper containers. Where glass bottles at the time were about 4.5¢ each, paper cartons were on 0.75¢. “It has been demonstrated,” the article stressed, “that milk will remain fresh in [paper cartons] twice as long as in glass.” In addition, paper containers weighed less and required much less space (Farran 2000:6). Despite these benefits, the industry and the consumers were not yet ready for the change.

On May 11, 1925, Irving Stanley filed for a patent for a “Receptacle and Method of Making Same and Means to Seal the Collapsed and Closed Ends.” He did not receive Patent No. 1,699,549 for his process until January 9, 1929, a delay of almost four years. Stanley assigned his patent to the Sealed Containers Corp. of New York. John O. Seifert filed for a patent on July 12, 1928, for a “Receptacle and Method of Making and Closing the Same.” The invention was another paper cone, of course, and he received Patent No. 1,844,825 on February 5, 1932 – another almost four year delay. Seifert assigned his patent to the American Sealcone Corp., probably grown out of the Sealed Containers Corp.

Called the Sealcone, these designs were for cylindrical waxed paper cartons that were crimped at the top (so that the cylinder was cone-shaped from a side view) to form a seal. These came in three sizes: quart, pint, and half-pint. Their ads touted the usual advantages of paper over glass, but offered no new reasons for switching (*Milk Route* 2000a:1). These containers, used by The Borden Co., were apparently very short-lived.

Square Cartons – ca. 1938

Giarde (1980:148-149) suggested that paper cartons (square in cross section and similar to those in use today) were “not put into general use until about 1938.” By 1936, however, the use of paper milk cartons was “confined largely to volume deliveries (to retailers, schools, and so forth). This volume business runs from 25% to 50% of the total, depending on the localities. Experiments are now in progress to determine how well paper-contained milk will sell on consumer routes” (*Business Week* 1936:16).

Sommer (1946:375) observed in 1946 that “paper bottles of various types have been available for milk for a number of years, but the industry has shown comparatively little interest until recent years.” Sommer added (1946:378) that “they meet with favor by grocers especially where charges were made for glass bottles.”

Pure-Pak Milk Cartons

As noted above, John R. Van Wormer had devised a pour spout or “gable-top” carton for his square, paper milk cartons covered by Patent No. 1,123,628 on January 5, 1915 and Patent No. 1,157,462 on October 19, 1915. These, however, were ahead of their time in 1915. The American Paper Bottle Co. of Toledo, Ohio, acquired the rights to Van Wormer’s patents during 1928 or 1929, apparently hiring him at the same time (Dairy Antique Site 2011).

On March 31, 1930, Van Wormer applied for another patent for a “Paper Container Closure” that was a practical way to form a milk carton from a single piece of waxed paper, using his gabled pour spout. He received Patent No. 1,854,319 on April 19, 1932 (Figure 2-47). He followed that with a design for a machine to “charging or filling, closing and sealing of packages or containers” – i.e., milk cartons. He applied for his patent on May 14, 1928, but did not receive Patent No. 1,997,502 until October 16, 1934, a full four and one-half years later. The machine essentially began with the flattened paper carton, turned it into a box, filled the box, and sealed the top (Figures 2-48, 2-49, & 2-50). He assigned both designs to the American Paper Bottle Co.

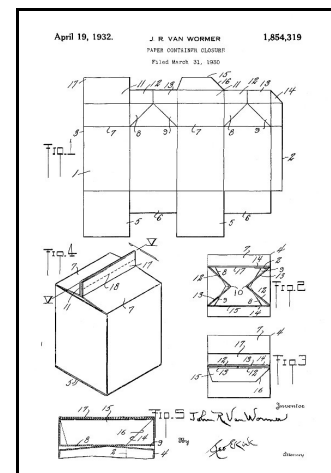


Figure 2-47 – Van Wormer’s one-piece paper carton, 1932

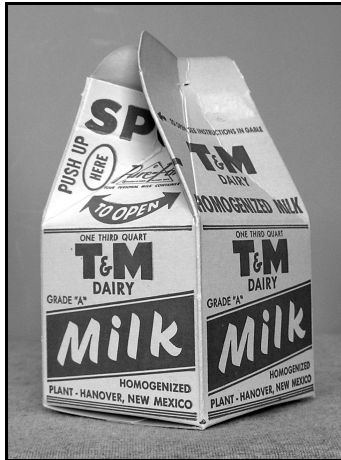


Figure 2-48 – Paper carton used by T&M Dairy, Hanover, New Mexico

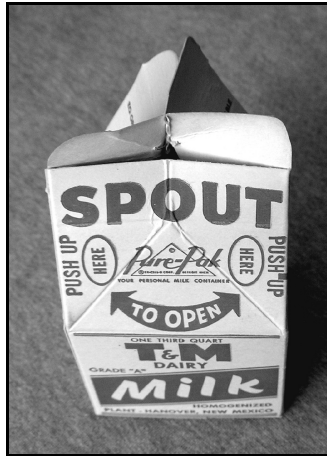


Figure 2-49 – Spout (partially unfolded)

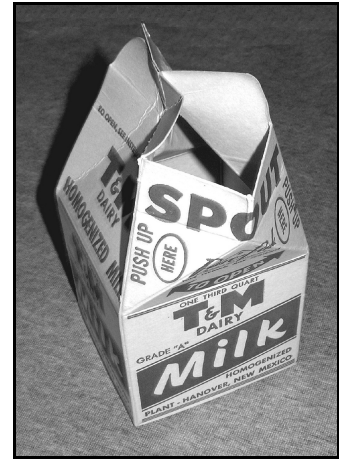


Figure 2-50 – Spout (open)

It was not until 1934, when the Ex-Cell-O Corp. of Detroit, Michigan took over the rights for the Van Wormer patents from the failing American Paper Bottle Co. that actual use of the cartons could be seriously considered. Ex-Cell-O almost immediately ran into problems and had to install entirely new equipment – in addition to fighting legal battles. eventually licensed the manufacture of the cartons to the International Paper Co., where they were introduced as Pure-Pak milk cartons. The Lucerne Cream and Butter Co., a subsidiary of Safeway, pioneered the use of the Pure-Pak in 1938 (Andresen & Andresen 2007:10; Dairy Antique Site 2011). These eventually became the industry standard.

American Can Co.

John M. Hothersall began this trend, when he applied for a patent for a “Container” on March 29, 1935. He received Patent No. 2,085,979 on July 6, 1937, and assigned it to the American Can Co. Hothersall’s closure was a separate cap that was attached to the paper container with a hinged arrangement (Figure 2-51). John Murch followed, on December 11, 1937, when he applied for a patent for a “Container Closure.” Designed to fit Hothersall’s waxed-paper container, the closure received Patent No. 2,182,818 on December 12, 1939. He, too, assigned the patent to American Can.

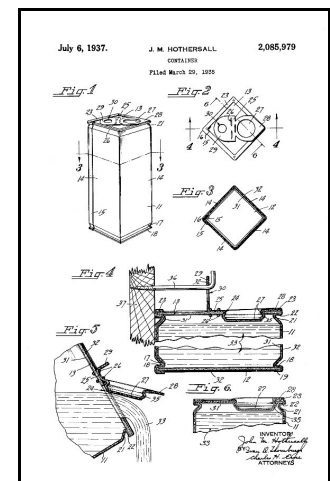


Figure 2-51 – Hothersall’s 1937 patent – an alternative paper carton

Next in line was Nicholas Pelosi, who filed on December 13, 1940, for a “Fiber Container” – another improvement on Hothershall’s basic design – and received Patent No. 2,328,579 on September 7, 1943. Russell Taylor further improved the design on March 21, 1944, with Patent No. 2,344,525 for another improvement. Both assigned their patents to American Can. Although certainly used, these were not as popular as the Pure-Pak.

Later Use

The use of milk cartons expanded from 30.3% of milk containers in 1949 to 77.3% in 1965, while glass bottle use declined by 63% during the same period (Haas 1970:72). However, most dairies preferred glass containers until at least the mid-1950s. By 1969, paper and plastic containers made up about 70% of all milk packaging (Gallagher 1969:95). Haas (1970:83) noted that in 1970 that “the glass milk bottle has virtually lost the milk container market to the paper carton, and the small segment it retains is currently being threatened by the plastic milk bottles.”

Plastic Milk Containers

The Federal Food and Drug Administration approve two stabilizers for plastic (polyvinyl chloride) containers for use with food products in January 1968. Dairies soon took advantage of this medium (Haas 1970:78). The use of plastic has continued to expand to the virtually complete elimination of glass containers in favor of plastic – along with a distinct reduction in waxed paper use.

Picks and Accessories

Although later caps were altered in various ways to create a tab to assist in removing the discs, the earlier caps had to be pried out with a knife or special tool commonly called a pick. Picks were manufactured from heavy-gauge wire and generally followed two configurations. The first was useable only as a pick. The front or pick end was flattened into a blade and trimmed to a pointed end. The rear or handle end was bent into a guitar shape and flattened. Embossed lettering frequently advertised the issuing dairy, although some only have decorative embossing (Figure 2-52). These usually only occurred in two lengths: 5 inches and 3 3/4 inches (Cernitisch 2000:4).

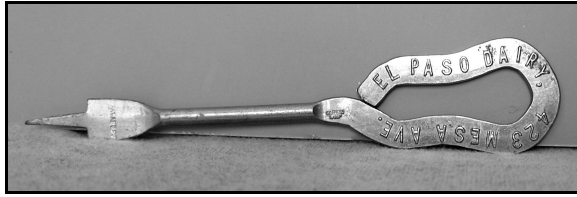


Figure 2-52 – Guitar-handle milk cap pick



Figure 2-53 – Combination cap pick and bottle opener

In the second configuration, the pick end was identical, but the handle end was in an oval loop with two small, flattened projections to act as a bottle opener. The central section of the wire was flattened to allow embossing (Figure 2-53). This style often advertised businesses “from undertakers to politicians” as well as dairies. The pointed blade was usually stamped “Patd 1/26/12” which sets a beginning date for this style of opener.

Normally, these were 6¼ inches in length. At least two minor variations exist, both with slight differences in the bottle opener end. One of these has the proximal end of the oval ring bend straight so that it forms a “D” shape. The second variation is more rounded and has twin flattened projections that creates a “V” shape between them (Cernitisch 2000:4). I have not discovered the use for the projections, unless they provide a better “stab” into the cap (Figure 2-54).



Figure 2-55 – Dacro opener

Heavy gauge wire openers were also made for the removal of the Dacro closures. These resembled the similar openers used on for the removal of crown caps on soda and beer bottles, except that they were much larger (Figure

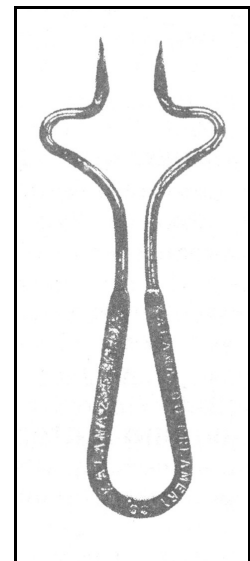


Figure 2-54 – Double pick (Cernitisch 2000:6)

2-55). The typical soda/beer opener measured 3 3/8 inches (8.8 cm.) in length and 1 1/2 inches (3.6 cm.) in width, where the typical Dacro opener measured 4 1/16 inches (10.4 cm.) in length and 2 1/4 inches (5.3 cm.) in width.

Wire carriers (handles) that slipped over the lip of the common sense finish were available by at least late 1919, when they were advertised in Hoard’s Dairyman (Rawlinson 1970:6).

On December 1, 1948, Clarence Arthur Olson of Eugene, Oregon, applied for a patent for a “Plastic Milk Carton Holder” and received Patent No. 2,600,911 on June 17, 1952 (Figure 2-56). Holders of this type were square in cross section to fit the cartons with the handle extension for pouring. Virtually identical holders remain available in 2011.



Figure 2-56 – Plastic holder for paper milk carton

Crates

In 1887, the Thatcher Manufacturing Co. presented specifications for “Milk Jar Crates or Cases.” Although any lumber would do, “basswood is preferred, as it is strong and less liable to split in handling.” The company added that “a place sawed out of the end near the top large enough to admit the hand, will be found a convenient handle for lifting the crates.” A final suggestion was that “all should be thoroughly put together with glue and screws or nails” (Taylor 1972:99). Such wooden cases were used during the late 19th and early 20th centuries.

Early case development had included shipping cases to contain ice and milk together (up to 20 quarts or 42 half-pints), wooden boxes with partitions (with or without lids), steel reinforced wooden boxes, and even iron cases (guaranteed to outlast any other styles). Galvanized steel cases and wooden cases with wire bottoms were used by at least 1911 and continued in use until at least the 1930s. Wider cases were developed for use with the squat bottles that became popular in the 1940s (*Milk Route* 2000b :1).¹

There are literally hundreds of patents for milk crates. As early as April 9, 1908, Harry E. Sanders of Zanesville, Ohio, applied for a patent for a “Case for Milk-Bottles” that had metal braces to separate the bottles from each other. He received Patent No. 917,156 a year later on April 6, 1909. David G. Adair carried the idea further, when he applied for a patent for a “Milk-Crate” on May 10, 1916. He received Patent No. 1,345,979 four years later on July 6, 1920. His crate had thick steel wires as bottle separators.

¹ For a look at eleven different types of cases available in 1928, see *Milk Route* 2000g:4-6.

The “Milk Crate” devised by Charles A. Woolsey appears to be the basis for many cases used in the 1920s. On October 31, 1921, Woolsey applied for his patent and received Patent No. 1,433,327 on October 24, 1922. He noted that his invention was “to provide a milk crate having means for supporting the bottles in an upright position therein, with provision for supporting crushed ice in the space or angle between the adjacent rows of bottles.” In addition, he wanted a crate that was “strong and durable and especially adapted for the purpose designed.” His style of board position corner brackets was used by many dairies. His patent is the first I have found for “ears . . . at the top of the crate [which] provide means for holding the crates in alignment when they are piled one upon another.”

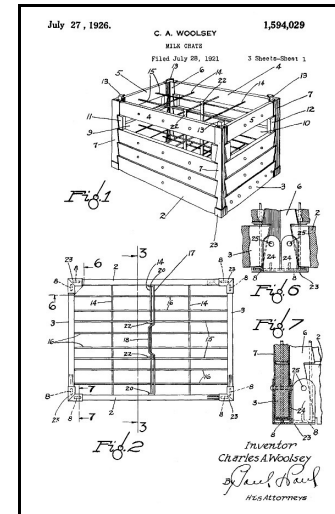


Figure 2-57 – Woolsey’s 1926 patent for a milk crate (based on his own 1921 design)

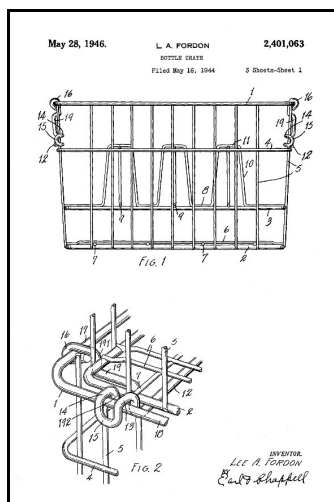


Figure 2-58 – Fordon’s all-wire crate

Although Woolsey improved on the crate in 1924 (Patent No. 1,505,628, August 19), 1926 (Patent No. 1,594,029, July 27), and 1932 (Patent No. 1,858,846, May 17 – with Henry Bowman), the basic design remained (Figure 2-57). Other patents (e.g., Robert Stoddard, Patent No. 1,781,825, November 18, 1930; Krueger & Lion, Patent No. 2,040,387, May 12, 1936) followed, they did not change the basic configuration.

Less steel was used in construction during World War II, when many metals were restricted to war use. After the war, when steel once again became available, cases were made from heavy-gauge steel wire, but some of the older wooden cases continued to be used. On May 16, 1944, however, Lee A. Fordon applied for a patent for a “Milk Crate” that was entirely woven of heavy-gauge wire (Figure 2-58). He received Patent No. 2,401,063 on May 28, 1946. Others (e.g., Dewey H. Bitney, Patent No. 2,438,030, March 16, 1948) filed improvements, but as in the 1930s, the basic design remained unchanged. One variation, filed May 7, 1949, by Robert A. Bruce, appeared to have seen considerable use in the industry. Bruce’s “Wire Container Having a Wire Stacking Ring” received Patent No. 2,512,517 on June 20, 1950 and he assigned it to the Baker Equipment Co., Keosauqua, Iowa (Figure 2-59)

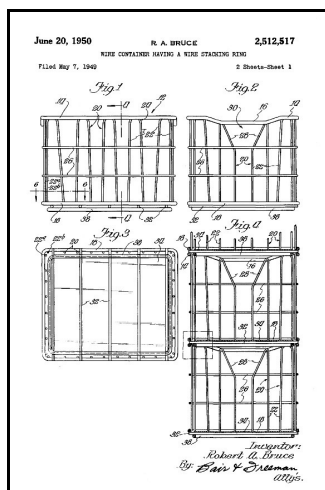


Figure 2-59 – Burce’s all-wire crate

Steel wire was also used to make baskets or carrying cases for milk delivery. These devices held anywhere between four and eight containers and allowed a deliveryman to more easily carry milk from the truck (or wagon) to the customer’s door. Although wire baskets for delivery were used at least as early as 1887 (Taylor 1972:97), the design had changed little by the end of home delivery in 1970.

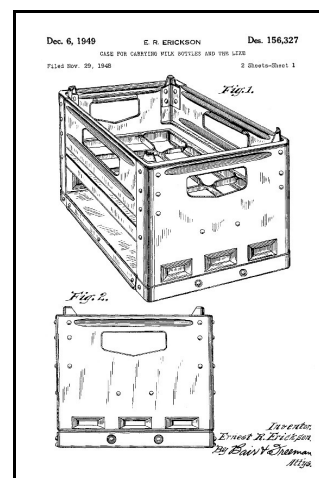


Figure 2-60 – Ericson’s crate

A different idea for a crate appeared in late 1948. On November Ernest R. Ericson applied for a patent for a “Case of Carrying Milk Bottles and the Like” and received Design Patent No. 156,327 on December 6, 1949 (Figure 2-60). Although Ericson’s case suggested metal end pieces, cases of that design were used with fiberboard ends.

Although he continued in the wooden-side tradition, Donald R. Swingle provided new support for paper carton milk delivery. On November 15, 1948, he applied for a patent for a crate for paper milk containers and received Patent No. 2,496,965 on February 7, 1950. Swingle explained his reasons for the new device:

In the past, milk crates have been designed primarily for use in handling glass bottles. These crates included spacers for the bottles and stacking irons at the corners of the crate. This type of construction has proved to be disadvantageous handling paper cartons since the latter were frequently scratched or otherwise damaged upon contacting the usual stacking irons upon withdrawal from the crate. Furthermore, with this conventional construction, the interiors of the crates contained other obstructions such as reinforcing braces which also resulted in damage to the paper cartons.

An object of this invention is to provide a crate having smooth unobstructed interior surfaces so as to prevent damage to paper containers to be carried therein.

In other words, Swingle designed a simple wooden box with handles and a reinforcing frame (Figure 2-61).

With the increased replacement of glass bottles by paper cartons in the 1950s, new cases were made from wood or aluminum, although these were rapidly replaced by tough, lighter, square molded-plastic cases beginning in the late 1950s (*Milk Route* 2000b:1-2). The combination of paper and plastic weighed much less and allowed the larger dairies to ship greater volumes of milk at lower prices.

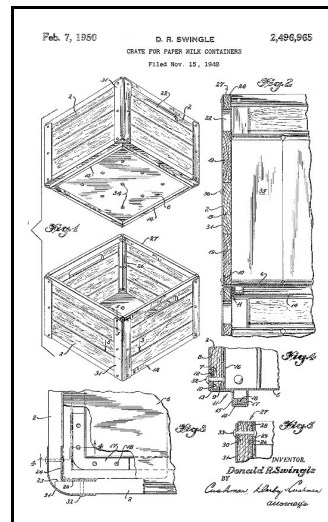


Figure 2-61 – Swingle’s case for paper cartons

Louis C. Folst led the way. On October 2, 1944, Folst applied for a patent for a “Plastic Milk Carton Case.” He received Patent No. 409,748 on October 22, 1944 (Figure 2-62). The drawing showed pint-sized wax-paper milk cartons in the crate, but Folst noted the it was “designed to carry goods such as liquids with may be bottled in containers other than glass as well as being suitable for glass bottles and jars.” Folst assigned his patent to the Edgewick Investment Co. of Las Angeles.

On September 20, 1954, Arlington W. Knieriem and Louis C. Folst applied for a patent for a “Plastic Case for Transporting Packaged Fresh Milk” and received Patent No. 2,773,624 on December 11, 1956. They assigned the patent to Calresin Industries, Inc., of Los Angeles. The invention was aimed at the transportation of fresh milk in paper containers. Stanley P. Lovell, however, converted the case to the square shape later adopted by the industry. He applied on May 15, 1959, for a “Combination Carrying and Stacking Case” and received Design Patent No. 188,073 on May 31, 1960.

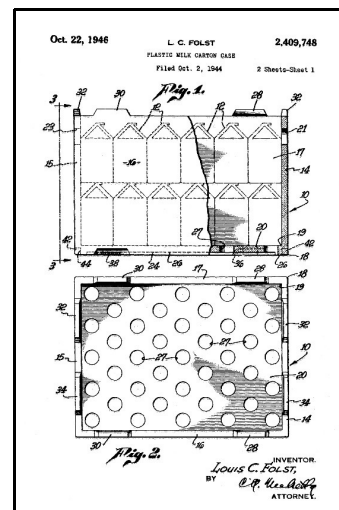


Figure 2-62 – Folst’s patent for a plastic case

It was Theodor Box, however, who made the idea work. After applying on November 26, 1962, for a patent for a “Plastic Carrying Case,” Box received Patent No. 3,186,586 on June 1, 1965 (Figure 2-63). I’m sure that Box received no end of jokes about his inventing a box. Box noted that the “conventional beer and milk carrying cases being constructed of wood and/or metal possess a great many

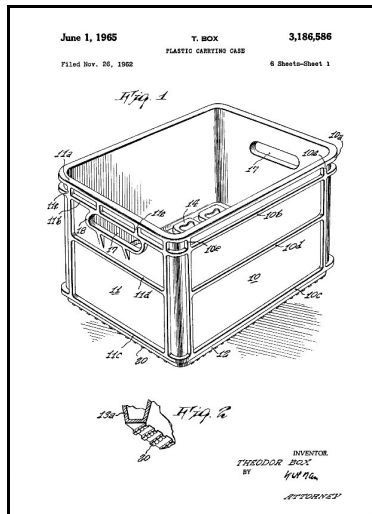


Figure 2-63 – The plastic “tote box” by Theodor Box

disadvantages and shortcomings” which his plastic “tote box” would relieve. He stated that earlier plastic boxes had only been “partially successful,” but his invention addressed all the past difficulties.

Rudolph H. Matthias and Robert L. Beesley applied for a square box design on April 27, 1964, and received Design Patent No. 200,602 on March 16, 1965.

Houston Rehrig, however, became

the father of the crate that became the industry standard. On December 11, 1964, Rehrig applied for a patent for a “Milk Crate.” He received Patent No. 3,341,060 on September 12, 1967, and assigned it to the Rehrig Pacific Co. (Figure 2-64). His crate lacked only one ingredient to make it just right.

Houston Rehrig and Richard F. Gildart added that ingredient very soon. Citing both Box and Matthias & Beesley, Rehrig & Gildart applied for a design for a “Crate for Milk Containers and the Like” on September 1, 1966 (Figure 2-65). They received Design Patent No. 209,865 on January 9, 1968, and assigned it to the Rehrig Pacific Co. Rehrig patented an additional designs in succeeding years (Design Patent No. 217,901 in 1970; Design Patent No. 231,905 in 1974; Patent No. 4,609,371 in 1986; Patent No. 4,946,059 in 1990).

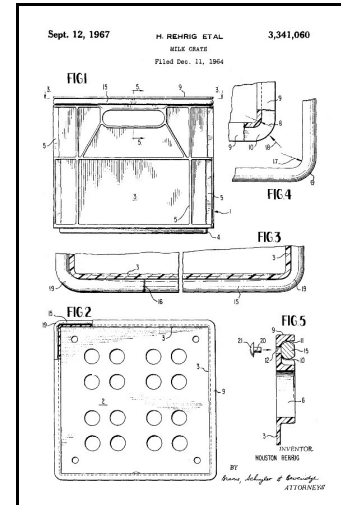


Figure 2-64 – Rehrig’s patent – the industry standard

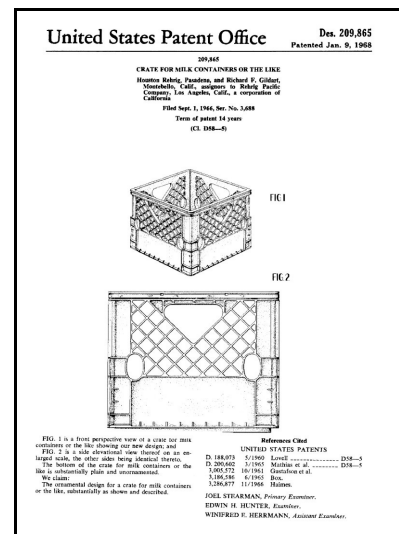


Figure 2-65 – Rehrig & Gildart’s improved design

Receiving Boxes and Customer Ordering Devices

Receiving Boxes

The idea of receiving boxes at the home predated the use of milk bottles. On February 1, 1870, C.W. Eastwood received Patent No. 99,417 for an “Improvement in Milk-Box.” The device was a wooden box with a tin insert. The milk man would pour milk into the tin insert through the outside opening (closed by a hinged door and locked to prevent tampering), and the housewife would remove the tin from the inside of the house (Figure 2-66).

In 1887, Thatcher Manufacturing Co. was suggesting that dairies provide receiving boxes for their customers’ use. Although the box could be of any size, Thatcher recommended that it hold at least six quart bottles. The company did not provide a detailed description for designing the box (Taylor 1972:101). Early receiving boxes were most likely made of wood and were not insulated. Although I have not found references to such boxes, a photograph of one is provided in Stewart and Cosentino (1976:70).

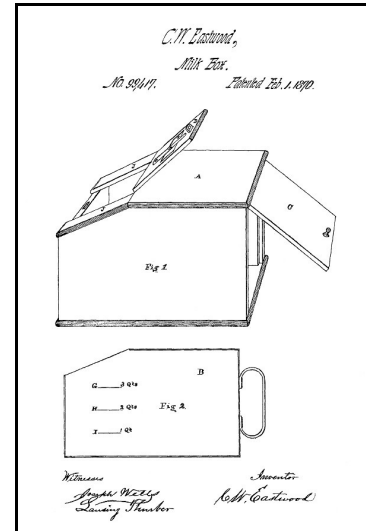


Figure 2-66 – Eastwood’s receiving box – 1870

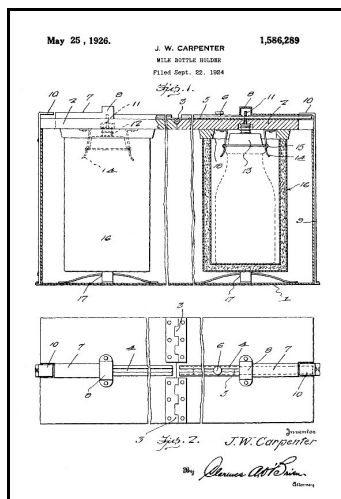


Figure 2-67 – Carpenter’s insulated receiving box – 1926

Many inventions during the first few decades of the 20th century were for devices to hang milk bottles from the outside wall (e.g., Patent No. 958,131, issued to William Leaf Jackson on May 17, 1910). Virtually all of these, however, left the bottle exposed to the elements and potential breakage. It is unlikely that any of this genre saw actual use.

Although receiving boxes were certainly in use during the intervening years (along with “milk chutes” that slid the dairy bottles into the house), the first insulated boxes may have been initiated by John William Carpenter. Carpenter applied for a patent for a “Milk Bottle Holder” on September 22, 1924, and received Patent No. 1,586,289 on May 25, 1926 (Figure 2-67). Although

Carpenter was concerned about security, he noted that his invention would “provide insulated receptacles for the bottles so that the bottle of milk may be maintained cold for a considerable length of time and at the same time prevented from freezing in the winter.”

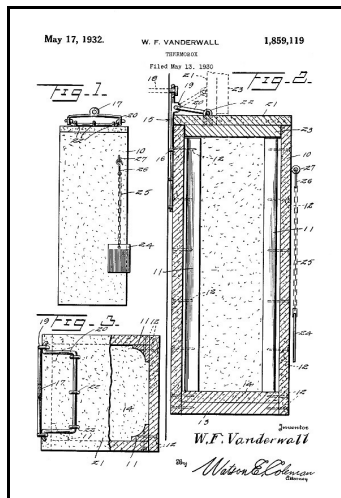


Figure 2-68 – Vanderwall’s Thermobox

On May 13, 1930, Wilbur R. Vanderwall applied for a patent for a “Thermobox.” As the name suggests, the “purpose of the invention was to provide a container which is adapted to receive a bottle of liquid and preferably milk or other dairy product and to maintain a substantially even temperature within the container so that the dairy product will not freeze during the winter or become sour during the summer.” The device further included an “order

indicator by means of which the distributor may know at a glance the exact quantity of milk or other dairy products ordered” (Figure 2-68) Vanderwall received Patent No. 1,859,119 on May 17, 1932.

These eventually developed into metal boxes (usually aluminum to prevent rust) with a hinged lid on top, lined on all sides with insulating material (Figures 2-69 & 2-70). Insulated boxes not only reduced breakage caused by freezing in winter, they also limited spoilage in summer, provided protection from “contamination by dogs and cats,” and helped eliminate theft. Dairies generally provided boxes free of charge to their better customers (*Milk Route* 1999a:4-5).

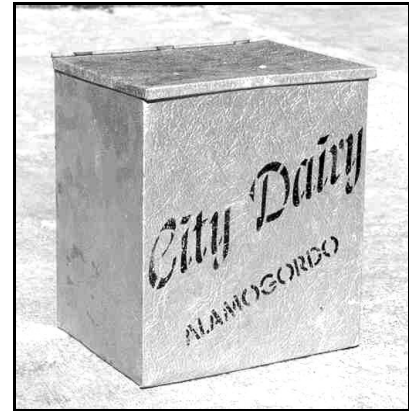


Figure 2-69 – Aluminum receiving box

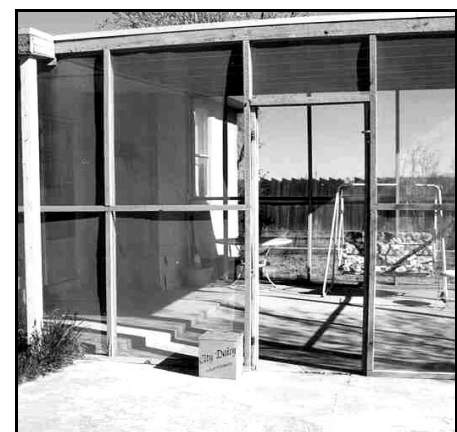


Figure 2-70 – Receiving box in place on porch

Order Signals

Thatcher's Patron's Want Scale eventually led to the development of order signals. The purpose of these devices was to help the customer order his or her milk for the next day. Leaving some form of order at the receiving box was more convenient for everyone.

In 1887, the Thatcher Mfg. Co. encouraged using:

a Patrons' Want Scale for each, quarts and pints . . . The empty bottles of yesterday's delivery can at the patron's leisure be placed in this box and the want scale adjusted for the day's supply. The Punch Ticket is always kept in the box . . . The milk dealer receives the empty bottles, supplies the full ones, punches this ticket and moves on, leaving the patron to bring them in at his or her leisure. It takes less time to deliver, is more convenient for the patron, and always insures the day's supply (Taylor 1972:101).

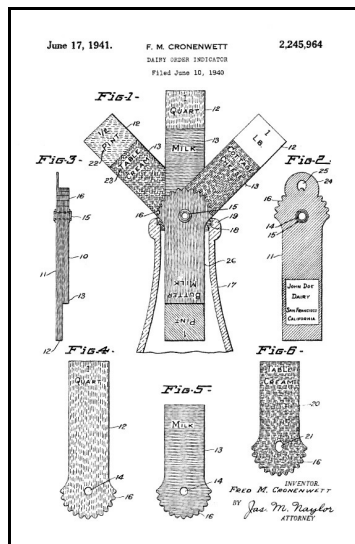


Figure 2-71 – Cronenwett's Dairy Order Indicator – 1941

Order Signals, tickets, and other devices to aid communication between the milk man and the customer had been proposed and used from Thatcher's day on, but a specific type, called the "Dairy Order Indicator" was invented by Fred M. Cronenwett. Cronenwett applied for a patent on June 10, 1940, and received Patent No. 2,245,964 on June 17, 1941 (Figure 2-71). A customer

could thereby order extra products by placing the order signal or indicator in one of the empty milk bottles inside the receiving box or on the porch. These probably remained in use until the end of home delivery.

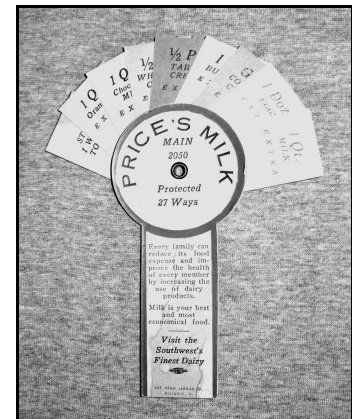


Figure 2-72 – Dairy Order Indicator used by Price's Dairy, El Paso

Made from stiff cardboard, these typically consisted of a ruler-shaped base that was placed in the throat of an empty milk bottle. A larger, often circular segment provided a pivot for

the identity tabs and kept the indicator or order signal from slipping into the bottle. Held in place by a central rivet, the number of tabs varied according to the products offered by each dairy and indicated items wanted above the normal order, such as 1 Qt. Milk EXTRA, ½ Pt. Table Cream EXTRA, etc. (Figure 2-72).

Bottle Life/Deposition Lag

The Return Trip Process

An ad in the A.H. Reid Catalog of 1899 (Tutton 1994:11) shows how unsophisticated bottle makers were at that time. Although the ad noted that “the system of delivering *milk and cream in glass bottles* has been in use for some time” (emphasis in original), they nonetheless suggested that “the best plan to follow in serving the milk is to leave a *full* and take away an *empty* bottle at each delivery. In this way it will take twice as many bottles as there are customers.” The Reid system, however, did not take into effect breakage or lag time which would require at least four times as many bottles as customers (probably more). Hopefully, dairies were more astute than that supplier.

Sommer (1946:372) discussed how the returnable system actually worked with milk bottles: “Even when prompt return of empties for bottles are required for each unit sold, allowing for washing and filling one day, delivery to the consumer on the next, possession by the consumer on the third day, and return to the milk plant on the fourth day to complete the cycle. However, under actual conditions the return of empties is invariably slower so that a much larger number of bottles is required. A recent survey in San Francisco showed nine bottles in service for every bottle of product sold.”

Date Codes

Because of the return trip process, each dairy had to have a ready supply of bottles, and the longevity of bottle usage – generally measured in “round trips” – was of vital importance to the producing dairy. According to Giarde (1980:80), on Owens-Illinois milk containers, “the digits were used . . . so that the company had a means of monitoring the life expectancy of its bottles and so forth.” The Thatcher Glass Mfg. Co., in late 1909, became the first milk bottle manufacturer to emboss date codes onto the bases of its bottles, although the American Bottle

Co. had begun that process on beer and soda bottles in 1906. It is highly likely that Giarde was correct – date codes were originally used to help determine the number of round trips.

Round Trips

In 1902, the Thatcher Mfg. Co. claimed that:

The average life of the best glass milk bottle as now used and with ordinary care is 30 trips. . . . The extreme limit of price between the very best and the very poorest bottle does not exceed \$1.00 per gross, and a few extra trips or a little closer capacity will soon make good the difference in cost (Thatcher 1902:6).

H.A. Walsh (1990:3) indicated a difference between wholesale and retail distributors: “Retail dealers’ bottles average 43.6 trips, while the wholesalers’ bottles average only 24.1 trips” in 1916. He attributed the difference to the retailer’s “having better control of his returns.” Although Walsh did not define the two, it is likely that a “retailer” distributed milk directly to customers via a route, while “wholesalers” sold to store or creameries. The overall average number of trips was 33.

Although the year was not mentioned, a more conservative estimate was presented by Scherer (1990:1). He remembered that “a milk bottle moving between grocery store and dairy [had a life of] four trips. The average life of milk bottles delivered to customers’ doorsteps by the dairy’s own deliverymen, who picked up their own empties, was 20 to 25 trips.” In either case, it is clear that home delivery was a *much* more effective way to conserve bottles.

The Glass Container (1922:8-9) noted that the Borden Co. averaged its milk bottle life at 25 trips, but that some New York City dairies had estimates as low as 15 trips. More importantly, the article noted that the “cost of a milk bottle is about six cents and *its life is only a few days*” (my emphasis). Ford (1924:10) placed “the average life of the milk bottle . . . between 20 and 50 trips.”

One 1923 estimate was set at 17 trips but noted that the average was formerly 11 trips. The study further found “that pints and half-pints have shorter lives than quarts . . . for pints the average trips are eight, and for half-pints, seven.” Among the probable reasons for this was that

is was easier for the small containers to slip out of the hand and customers were more prone to keep smaller sizes for home uses (*Glass Container* 1923:6-7).

The Milk Dealer in 1928 (*Milk Route* 2000e:3) agreed that generally, more small bottles were broken in plants. Pint and smaller containers “often stick in the filling machines, especially when being filled with cream, and the pressure in the bottle washer sometimes forces them out, whereas[,] quart bottles usually give no trouble in this respect.” The breakage of smaller bottles was mitigated, however, since “quart containers have a tendency to chip more easily than do the smaller bottles.” Unfortunately the article did not specify whether the greater chipage in larger bottles was equally offset by the greater breakage of smaller ones.

Yet another round trip estimate was subdivided into size units in 1939. In this study, quarts made 19.2 trips; pints, 10.5 trips; and half-pints, 11.6 trips (Ross 1939:360). Although these were slightly closer in relation to each other than the 1923 study, there was still a notable increase in breakage among smaller bottles.

According to the *El Paso Herald Post*, in an article about the opening of the newly merged Midwest Dairy in 1933, “Statisticians estimate the life of a milk bottle is just 20 complete round trips from the dairy to the customer and back.” The paper noted that “milk bottles constituted the largest single item of expense in the operation of a dairy plant” aside from “the product itself [i.e. milk]” and labor (*El Paso Herald Post* 8/17/1933).

By 1938, however, the *Association Quarterly* claimed that “you can expect the country-wide average of 35 trips from [a colorless milk bottle]” (reprinted in *Milk Route* 1999b). Interestingly, milk bottles comprised only 5.19% of all glass containers produced in 1937. A 1942 article confirmed the 35 trip average (*New York Times* 8/20/1942).

National Geographic (1943:30) noted that “a quarter of a century ago the average life of a milk bottle was 20 to 22 trips. Now they make from 50 to 60 trips. That longer life is equivalent to making three times as many bottles.”

Sommer (1946:372) noted: “In a survey of 76 distributors Kelly and Clement’ found a range of 6 to 91 trips per bottle, and concluded that the average milk bottle makes only about 30 trips.” On page 373, he added, “The greater part of the bottle loss occurs because the bottles are

not returned due to unethical or illegal traffic in bottles, indifference on the part of the consuming public, and laxity on the part of milk wagon drivers in the performance of their duties.” By 1959, the number of trips was estimated at 32 (*Glass Industry* 1959:16-17).

Stanpac (*Milk Route* 2000f:7), founded in 1949 as a manufacturer of bottle caps, noted that there was a small revival of the use of returnable milk containers in 1980 for some local dairies. Even with the revival, returnable containers made up just over one percent of all liquid milk shipments in 1996. In an attempt to use this market, Stanpac noted that “typically, a refillable glass container is reused on the average of 25 times.” Therefore “a bottle refilled 25 times will use 95% less glass and 90% less energy than the total process of producing 25 bottles in closed-loop recycling.”

Problems with Returnable Dairy Bottles

There seems to have been two major problems involved in the retention of returnable bottles: 1) theft by consumers; and 2) theft by other (usually smaller) dairies. I use the word theft because the containers were owned by the dairies – not the customers. Consumers bought the contents of the bottle; the container, itself, remained the property of the issuing company. That most customers were unaware of this ownership is legally irrelevant, but it provides an explanation from a practical viewpoint.

Although soda bottlers had dealt during the early part of the 20th century with the twin problems of the use of labeled containers by other companies (called foreign bottles in the trade) and the lack of returns by individuals and stores, such problems plagued the dairy industry until at least the 1940s. Unlike soda bottlers, whose main sales derived from retail sales through stores, sales by dairies were divided between the normal retail outlets and home delivery by the dairy. The losses from retail sales were similar to those experienced by soda bottlers (see Lockhart 1999; 2010). These included hoarding, reuse of bottles for both dairy products and other liquids or solids, and, occasionally, for curation (collecting) and decoration.

The laws and the exchange that addressed the use of foreign bottles (see below) were ineffective in tracing containers lost to individual customers. In an ingenious solution, some dairies placed ads in the local papers that “appealed to the fairness of the milk consumers,”

asking them to return any empties that had accumulated in their homes. Not only was the strategy effective, follow-up, “Thank You” letters in the same papers were equally effective in attracting lost bottles from the customers. The results of the nine-day advertising campaign was the return of 40,000 bottles. At a bottle cost of 5¢ each, the dairies attained a net profit of \$1,850, a substantial sum in the late 1920s (*Milk Route* 2000d:4).

Surprisingly, some of the worst offenders lived in the “better section[s] of the city.” Instead of returning the bottles, maids were often accumulating them in basements or other storage areas. It was not unusual for drivers to pick up 40 to 100 bottles, and one home returned 400 containers. In fact, many maids and housewives admitted that they had not realized that the companies expected their bottles to be returned – glass containers were simply discarded or stored as if they were waxed paper cartons used for butter or ice cream (*Milk Route* 2000d:4).

Although, in the past, the dairy industry had assumed that missing bottles were used to store paint, preserves, home brew, etc., the campaign showed that most were “simply stacked away” (*Milk Route* 2000d:4). In some areas, however, missing bottles were actually put to use. Willy McMurphy (interview, 1999) noted that in Alamogordo both the bottles and the wood-and-steel carrying cases often disappeared. Route men frequently observed the cases being used to prop up automobiles and the bottles collecting the oil drained from the crank case. A charge for missing bottles was then added to the bill.

An anonymous writer discussed the use of foreign bottles in Springfield, Illinois, in the pages of the *Milk Dealer* in 1927 (*Milk Route* 2000d:3-4). A bottle exchange operated by the city’s three largest dairies was proving effective in reducing the theft or use of labeled bottles by other companies. The article noted that:

the state law, rigidly enforced by the state department of health, had practically eliminated the use of one company’s bottles by another company. The constant vigilance of the department inspectors, and a fine or two as a sample, had successfully stopped the leak of labeled bottles to the smaller companies—these individuals now use their own or unlabeled bottles (*Milk Route* 2000d:3-4).

In 1922, Pittsburgh, Pennsylvania, instituted a milk bottle exchange program backed by a fine of 50¢ per bottle for dairies or private individuals “using bottles illegally.” Their

investigations were revealing. In one case, “a small laundry had a back porch where employees frequently ate their lunch. One plank was loose in the porch structure. When inspectors spotted it, 2,600 bottles were discovered.” A woman in the area had filled 50 milk bottles with her winter’s supply of tomatoes. A man in Braddock (a suburb) was building a “garden path” and “took 470 bottles, turned them bottom-side up and lined them where he wanted the path. Filling the spaces between cement or earth, he had a unique glass walk.” Another cook filled 700 milk bottles with chili sauce (Lloyd 1991:2).

Exchanges in California seemed to be very effective in preventing bottle loss. An anonymous author noted that “before the exchanges were established, the average milk bottle was good for about seven trips only, but this has now been increased to as high as forty trips” by the ten state bottle exchanges. In 1929, the exchanges handled 13,000,000 milk bottles, 40,000 milk cans, and 54,000 cases (*Glass Container* 1930:28).

These examples illustrate that hoarding was a major problem in some (possibly most) areas. Often the hoarding had more to do with inconvenience (as in the case of workers tossing bottles under a loose board on the porch or a maid storing bottles in a garage) than intentional theft of the bottles. However, the problem was bad enough by 1938 that one author complained, “Nearly every day at least one bottle, perhaps more, will come into the exchange marked with the name of a dairy that has been out of existence for several years” (*Milk Route* 1999b:1).

In 1936, Metzger Dairies in San Antonio, Texas, noted that at least some of the return problem derived from labeling for two reasons: 1) poor visibility of embossing; and 2) the open use of foreign bottles. The labels on colorless, embossed bottles are very difficult to see clearly. It becomes even more difficult when the bottle is filled with white liquid. As a result, consumers returned bottles indiscriminately (*Milk Route* 2000c:2)

In addition, San Antonio had no bottle exchange service, so that none of the dairies “could say we filled even 50 percent of our own bottles.” The use of bottles from foreign dairies was further confused by the use of caps that identified the dairy most recently filling the container. So many containers actually had two labels – one on the cap and a different one (embossed) on the bottle. Metzger’s suggested two solutions: 1) brighter pyroglazed (or applied color) labeling that was more noticeable than embossing; and 2) the use of cooperative, generic bottles by all dairies in town. If cooperative advertising worked, they reasoned that cooperative

bottle use would work also (*Milk Route* 2000c:2). A similar solution was used by small dairies in the El Paso Milk Bottle Association in the late 1940s. Each bottle had a generic pyroglazed label, and each base was embossed with the Association initials: E.P.M.B.A.

Deposits on Milk Bottles and Tickets

One solution to the lack of return was to charge a deposit (varying from 2¢ to 5¢, depending on the time and place) on each milk bottle. In some areas, this was only charged on bottles bought from stores, but, in others, it was required for home-delivered bottles as well. All solutions breed new problems, and this was no exception.

The stealing of milk bottles to return for a deposit became a problem in some locations. Children were especially a problem, taking bottles from doorsteps before the local route man could retrieve them. A surprising second group was mothers taking home-delivered bottles to stores for credit. A final problem was milk men! Some route men were taking some of the bottles they collected to stores for credit. Despite the problems, theft seems to have been less of a problem under the deposit system than in areas that maintained bottle exchanges (*Milk Route* 1999b:4).

A ticket system, adopted by at least 1907, was similar. A customer on a route was sold a package of ten tickets for a dollar (ten cents each). Winslow (1907:167) explained:

Then the first day two tickets are withheld, one paying for the milk and the other for the bottle. If the bottle is returned the following day and another bottle of milk is delivered, then the customer gives but one ticket to the milkman. But if the first bottle is not returned, then the milkman takes two tickets the second day and so forth. Every returned bottle by a customer means that he receives a ticket or credit for a ticket for each bottle returned. And an empty bottle is regarded of the same value as one quart of milk.

The system apparently did not gain general acceptance.

Washing Damage

Sometimes cleaning the bottles presented a problem, especially when the container had been reused to collect oil or other hard-to-remove substances. Bottles had initially been washed by hand, a less efficient process but one that helped increase bottle longevity. When bottle washing machines were introduced, the caustic solution (much stronger than that which could be used in hand washing) would etch into the glass after repeated washings. Improved cleaning efficiency resulted in shorter bottle life.

Deposition Lag

Deposition lag is a major issue in historic archaeology that is often ignored. At its very best, deposition lag is difficult to address and very complex. The issues noted above are only part of the complexity. Lockhart (1999) wrestled with the issue of deposition lag in returnable soda bottles and concluded that a ca. five-year period of bottle survival was a good average, although smaller bottles lasted longer, as did older bottles.

Soda bottle longevity, however, cannot be generalized to milk bottles – especially during the period when home delivery was the typical mode. Data summarized from above suggest:

1. Throughout most of the 20th century, ca. 30 round trips per quart bottle is a reasonable average.
2. In contrast to soda bottles, quarts generally made more round trips than smaller sizes.
3. The process of delivery, return, washing, refilling, and re-delivery took ca. 10 bottles.
4. Assuming that a typical bottle was delivered on Day 1, used over a four-day period (a conservative estimate), returned on Day 6, washed on Day 7, and refilled on Day 8, it would be delivered again on Day 9. Add an additional six days for store turnaround, and we have a total of 15 days in the typical cycle.

If we multiply the trips (30) times the maximum probable length of a single trip (15), we get 450 days – 64 weeks or 15 months. It is thus highly probable that the average deposition lag was less than two years. This suggests that milk bottles may be one of the best indicators of an actual date of deposition in the archaeological record. This estimate is based on two additional assumptions: 1) the bottles were shipped upon manufacture (rather than stored prior to shipping); and 2) the bottles were used immediately by the dairies.

The first assumption is almost certainly valid for embossed milk bottles. Evidence from almost all areas shows that bottlers of all types were fickle, with no brand loyalty. Most dairies, soda bottlers, and breweries followed the sales and bought where the prices were to the bottler's best interest. Glass houses would have been crazy to amass an inventory of anything but generic bottles. Unmarked bottles, however, may have been warehoused prior to sales.

The second assumption probably varied according to the size of the dairy. Smaller dairies typically ordered full or half carloads (railroad cars) of bottles to take advantage of sales. That was usually more bottles than the dairies needed immediately, so they were stored. Larger dairies, however, used more bottles and would put each order into use more quickly.

As usual, of course, there are far too many variables to deal with deposition lag on any but the most superficial level. Any given bottle could have been stolen by a customer and hoarded for decades. In fact, that is one of the ways that collectors derive their most perfect bottles. Thus, all but the most general knowledge about deposition lag falls heavily into the realm of speculation.

National Companies

The Borden Co.

Gail Borden became involved in milk production in 1857 and primarily dealt with condensed milk. He began Fluid milk sales in 1875 and began bottling the product a decade later (1885). The oldest bottles were embossed with an eagle and "PROPERTY OF N.Y. CONDENSED MILK CO." About 1900, bottles were still embossed with an eagle, but the wording was changed to "PROPERTY OF BORDEN'S CONDENSED MILK CO." The name was diminished to The Borden Co. in 1919, and bottles were embossed "PROPERTY OF BORDEN'S FARM PRODUCTS DIVISION." At an undisclosed later date, bottles were marked "PROPERTY OF BORDEN'S FARM PRODUCE CO., INC." A final notable dating device was the introduction of Elsie the cow at the 1939 World's Fair. Elsie became a national success and was used on subsequent advertising including pyroglazed bottles (Tutton 1992:49-50; 1994:159-160; see also Frantz 1951).

Lucern, the Safeway Brand

The Lucern Cream and Butter Co. began in 1906 at Hanford, California. On March 19, 1929, the three-year-old Safeway, Inc. purchased the Lucern plant to make dairy products exclusively for its stores. The number of dairies under the Lucern umbrella gradually grew to 24 in the U.S. and Canada. Eventually, butter, buttermilk, cottage cheese, and virtually all dairy products were produced by Lucern and offered at Safeway. The Hanford plant was closed on March 26, 1993 (Lack 1999:1-2).

Acknowledgments

I am grateful to Al Morin and Paul Doucette for leading me to several great sources for milk bottle information. A tremendous hand also goes to Pete Schulz for discovering so many articles from dairy journals. Kudos also to Doug & Linda for their online Dairy Antiques site.

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