

Chapter 2a
Dating Milk Bottles
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The basic idea behind dating all bottles follows the same principles. Such generalities as manufacturing techniques, manufacturer's marks, and different labeling styles are somewhat universal. Because of these similarities, please see Lockhart (2010) or Lindsey (2011) for general dating techniques. This chapter will be devoted to dating issues that relate only to milk and dairy containers.

The archaeological community has been notably silent on the subject of dairy containers. Jones and Sullivan (1989), the accepted authority for glass terminology contains no category for milk bottles and very little information specific to dairy containers except a brief description of disc closures (see below). Because milk bottles are usually associated with 20th century deposition (with occasional late 19th century containers found in northeastern contexts), little research appears to have been generated.

Initially, milk was delivered in cans stacked upright in a wagon (see Figure 1-1). At each stop, someone (usually the wife of the house) would bring a pitcher or a pail to the wagon, and the milk man would ladle out the desired amount of milk. Needless to say, this practice was hazardous and unhealthy. The New York State Tuberculosis Association condemned the practice of selling "loose milk," still being conducted in New York City in 1922, as a major cause for the spread of tuberculosis (*Glass Container* 1922:8). It is probable that the delivery of milk in glass containers became universal shortly thereafter.

Because the topics of finishes and closures are so complex, I have given them their own chapter (Chapter 3). They are both certainly part of the manufacturing process, and they are highly instrumental in assessing dates of both individual bottles and archaeological assemblages. However, they have their own attributes apart from the more complex manufacturing process.

Milk Bottle Design Changes

Early Milk Jars

Tutton (1994:3) stated that the Lester Milk Jar was patented January 29, 1878. A screw clamp held the lid in place, but the entire container was awkward. Knipp (1999:4) noted that some of the jars were patented “Nov. 16, 1868,” along with other patent dates of October 9, 1877. He also presented evidence that the jar was used until at least 1881 and possibly until 1888. Knipp also observed a logo embossed on the body of the bottle that he translated as LMCo for the Lester Milk Co. The Dairy Antique Site (2011) added that the bases of the jars were embossed “LESTER MILK CO.” and the LMCO initials are on the lid.



Figure 2-1 – Warren Milk Jar (Courtesy Dale Murschell)

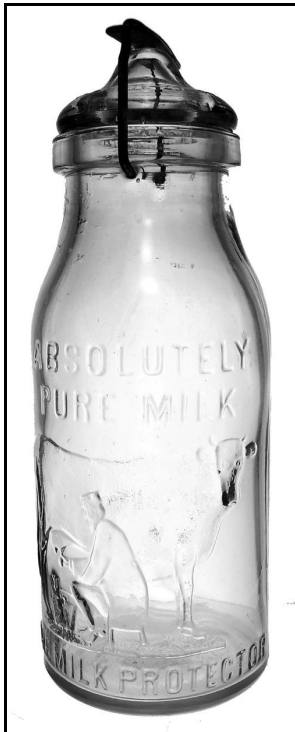


Figure 2-2 – Thatcher Milk Protector (Courtesy American Glass Auction)

In 1879, the Warren Glass Works began advertising the Warren Milk Jar in New York City. The Whiteman brothers – owners of the firm – moved the plant to Cumberland, Maryland, the next year and concentrated on milk jar production. All of their jars used variations on what has become known as the tin-top closure (Figure 2-1; also see closure section). The Whitemans continued production into 1891, although A.V. Whiteman continued to have the bottles made by other glass houses and sold them from his New York office until at least 1904 (Gallagher & Munsey 1969:331; Schulz et al 2010:46-57; Tutton 1994:4).

Harvey D. Thatcher of Pottsdam, New York, offered a bottle embossed Thatcher Milk Protector to the public between 1884 and 1889. This bottle was another tin-top, following the basic lightning closure style (Figure 2-2). By 1885, Thatcher was advertising his milk protector as “the ONLY PLAN KNOWN that secures to the consumer ABSOLUTELY PURE MILK in such manner that it can be kept sweet

for several days, furnish a good coat of cream and is handy to use. . . . THE SEALED BOTTLES are easy for the patron to store as they can be kept in a refrigerator without imbibing its odor” (Tutton 1994:8).¹

Two of his associates, however – Harvey P. Barnhart and Samuel L. Barnhart – patented the “common sense milk jar,” which used the cap seat and ligneous disks as a seal, on September 17, 1889 (Patent No. 411,368 – Figure 2-3). Although a number of other patents for variations would follow, the delivery of bottled milk became practical because of the Barnhart’s invention – sold by the Thatcher Mfg. Co. (Gallagher and Munsey 1969:332; Lockhart et al.2007:53-55; Scharnowske,1998:6; Tutton 1997:6). The container became so popular that Thatcher was called the father of the milk bottle.

Late-19th century milk containers were made in a variety of sizes, styles, and finishes. These were frequently embossed with the name of the dairy that used them and at least a partial address. Closures were made from glass or metal, and, of course, the ligneous disk that eventually made all other closures obsolete (Tutton 1997:6-7). Most pre-1900 milk bottles were used in the eastern section of the U.S.

Fruit Jars Used for Milk

Knipp (1998:2-3) presented his commentary on and excerpts from a January 1880 treatise by Dr. J. Cheston Morris, entitled “On the Method of Milk Shipment in Glass Jars”:

The use of the Cohansey fruit jar (quart size) was promoted as an improvement to the method of delivery and quality of the milk. “The milk is drawn off into quart

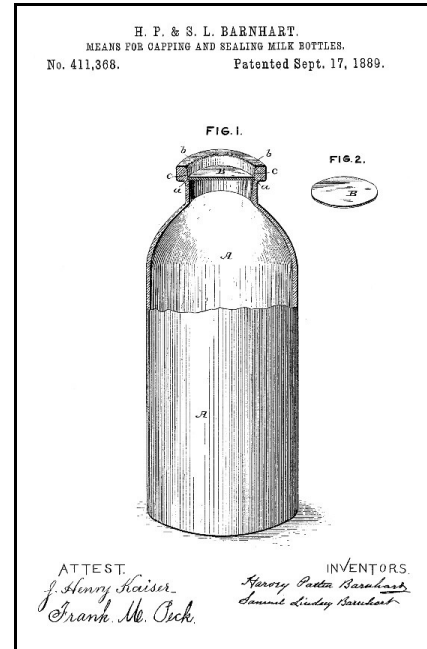


Figure 2-3 – Banhart brothers patent for the Common Sense Milk Bottle

¹ Note that ice boxes were also called refrigerators – mechanical refrigerators did not yet exist in homes.

jars, each jar is closed and sealed with the name of the producer and date of shipment Twenty of the jars are packed in a box and are ready for shipment to the customer.” In warm weather, some jars were filled with ice. Dr. Morris contended that is (*sic*) this manner the customer gets the real article furnished by the producer and not altered by the milkman.

Knipp further noted that “pint Cohansey jars were used (in later years) by Echo Farm and the Deerfoot Farms of Mass” (Figure 2-4).

The Dairy Antique Site (2011) also reported the use of Cohansey jars by Deerfoot Farms, Southborough, Massachusetts, as well as other dairies and the use by some of the Crystal jars, Pet fruit jars, and Putnam’s Lightning jars. The Cohansey Glass Mfg. Co., Bridgeton, New Jersey, was open from 1869 to 1900, when the plant was moved to Downingtown, Pennsylvania, and the name was changed to the Cohansey Glass Co. The plant closed permanently in 1911.

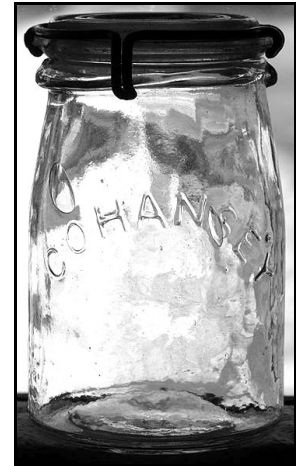


Figure 2-4 – Cohansey jar

Common Sense Milk Bottles



Figure 2-5 – Common Sense milk bottle (*Cultivator and Country Gentleman* 1895)

In 1889, H.P. and S.L. Barnhart, employees of Harvey Thatcher, Potsdam, New York, patented the “Common Sense Milk Bottles.” The finish of this bottle had a built-in ledge to support a ligneous (cardboard) disk for a closure. These cylindrical bottles had a wide body and fairly wide mouth (Figure 2-5; also see Figure 2-3). They became the industry standard by 1900, replacing the earlier glass top, “tin top,” and other finish types (Giarde 1980:114; Pollard 1993:285; Taylor 1972:46). Thatcher’s bottles were advertised as “the handsomest, cheapest, and best milk bottle ever offered for sale in any market” (Gallagher 1969:50; Gallagher & Munsey 1969:333; Lockhart et al.2007:53-55). By 1902, Thatcher’s bottles normally came with “TO BE WASHED AND RETURNED” embossed on the reverse side (Thatcher 1902:3-4).

Universal Store Bottles

About 1913, some areas adopted the Universal Store Bottles. These bottles were embossed STORE / 5¢ / BOTTLE and could be sold in stores by any dairy in areas using the bottles (Figure 2-6). This generic bottle eliminated the sorting of bottles according to individual dairies (Walsh 1990:3). I have not discovered how long the practice existed or how well it worked.



Figure 2-6 – “Store” milk bottle (Owens-Illinois 1930:M14)

Cream-Top Milk Bottles

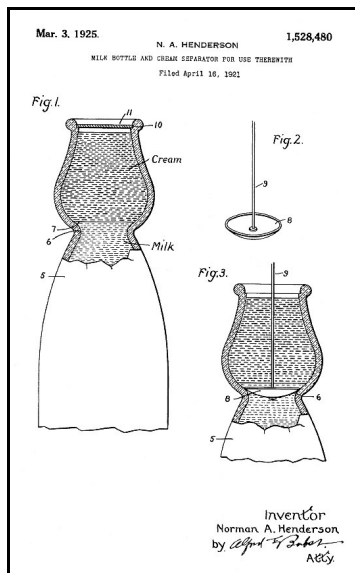


Figure 2-7 – Cream-top milk bottle patent

On March 3, 1925, Norman A. Henderson received Patent No. 1,528,480 for a “Milk Bottle and Cream Separator for use Therewith” and assigned it to the Cream Top Bottle Corp. These bottles display a bulbous neck to contain the cream as it rises to the top of the milk (Figure 2-7). Henderson had applied for the patent on April 16, 1921, almost four years prior to receiving the patent. The delay may have been due to earlier bulge-neck patents for other bottle types. Not surprisingly, the container became known as the cream top milk bottle (Giarde 1980:31).

Henderson had included his own device for plugging the neck to allow the cream to be poured off, but Herbert E. Hill invented a special spoon (or separator), shaped to fit into the bottle neck, that was simple and more effective at holding back the milk while the cream was removed (Figure 2-8). Hill applied for his patent for a “Separator for Milk Bottles” on August 3, 1922, and received Patent No. 1,506,752 on September 2, 1924, six months prior to Henderson’s bottle patent (Tutton 1994:33). Because of its efficiency, the spoon came into common usage.

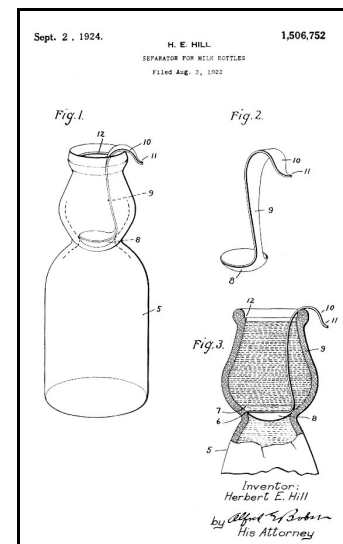


Figure 2-8 – Patent of the spoon for the cream-top bottle

Ruth M. Clark designed a square version of the cream top. Her design included flattened sides on the “bulge” and chamfered corners on the square body. She applied for the patent on March 2, 1944, well before the date that Owens-Illinois announced its square milk bottle design (see below). Clark received Design Patent No. 136,997 on January 11, 1944, and assigned it to Norman A. Henderson. As may be gleaned from the above, the Cream Top Bottle Corp. was the exclusive manufacturer of this type of bottle until the patents expired. After that, similar bottles were made by the Illinois Pacific Glass Corp., Pacific Coast Glass Co., Owens-Illinois Glass Co., Thatcher Mfg. Co. and Lamb Glass Co. See Dairy Antique Site (2011) for more information.

Baby Top Variation

Michael A. Pecora designed a subtype of cream top that came to be called a baby top by collectors. Pecora applied for his patent on December 2, 1935, and received Design Patent No. 98,609 on February 18, 1936 (Figure 2-9). Pecora assigned the patent to the Pecora Farm Dairy, a partnership composed of Michael A., Pasqua, and Salvador Pecora. These containers, made in half-pints, tall, tapered half-pints, quarts, and half-gallons, exhibited an embossed baby face on the bulbous neck (Tutton 1994:38).

Pecora filed another patent on September 3, 1948, for a similar bottle with two baby faces – on opposite sides of the bulbous neck. He received Design Patent No. 155,834 on November 1, 1949, and also assigned this one to his family dairy. These bottles survived the change to square morphs as did the regular cream top. Oddly, Pecora also designed a baby-face ice cream cone and received Design Patent No. 109,940 on May 31 of the same year.

Pecora formed the Pecora Baby Top Products Co. to sell bottles of this design. This, however, was a distribution firm not a glass house. Various glass manufacturers produced the actual containers. For more information, see the Dairy Antique Site (2011).

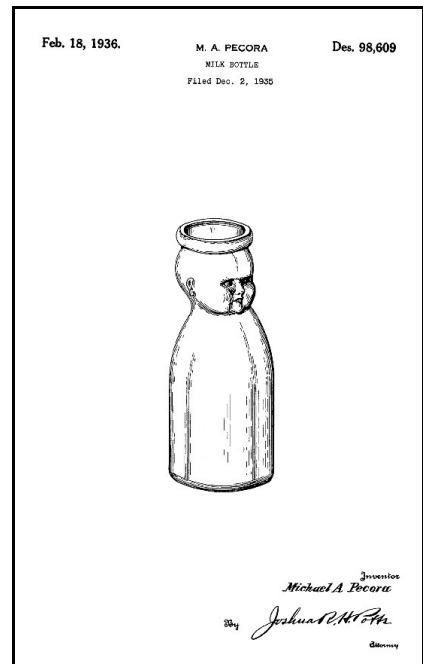


Figure 2-9 – Babytop milk bottle patent

The Dairy Antiques Site (2011) explained that:

One difference from the Cream Top milk bottle was that the Pecora Baby Top Products Company advertised that a cream separator device was not needed with the Baby Top milk bottle. Simply pouring over the side of the baby's head would result in the cream being removed. Pouring over the baby's face would result in whole milk being removed. The constriction at the baby's neck was oval rather than round like the Cream Top milk bottle. Presumably this difference is what allowed the cream to be removed without a separator but in reality a Cream Top Separator Spoon would work quite well and improve the separation of the cream.

Cop the Cream

A second spinoff was called cop the cream because the bulbous neck on these bottles contained a stern face thought to resemble that of a police officer. Robert C. Gennaro, Vincent L. Gennaro, and Emil L. Gennaro jointly applied for a patent for this bottle on October 16, 1937, and received Design Patent No. 108,074 on January 25, 1938 (Figure 2-10). The bottles were made in half-pints, pints, and quarts (Tutton 1994:40).

The Gennaros formed the Cop the Cream Bottle Co. to vend the bottles. As with the Pecora firm (above), this was a sales and advertising concern, not a glass manufacturer. Cop the Cream contracted with the Universal Glass Products Co. to make the containers. See the Dairy Antique Site (2011) for more information.

Modern Top

Still another variation, the modern top milk bottle, was manufactured with an elongated bulb and a more constricted neck (Tutton 1994:41). On November 21, 1936, William C. Teunisz applied for a patent for a “Cream Separator and Milk Container” – although his description centered around the cream separator (Figure 2-11). He received Patent No. 2,112,233 on March

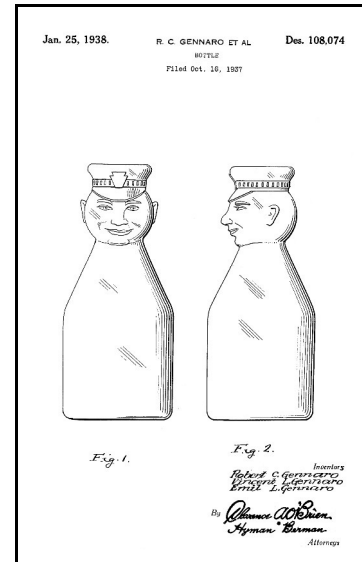


Figure 2-10 – Cop-the-cream milk bottle patent

29, 1938. Just as soon as the separator entered the protected realm, Teunisz applied for a patent on the bottle – on April 8, 1938 – and received Design Patent No. 111,311 on September 13, 1938. He applied for and received patents for one or two additional improvements a year through 1943.

In 1940, Teunisz designed a cone-shaped milk bottle (Design Patent No. 124,880, January 28, 1941), although it was apparently unsuccessful. He also applied for another patent on July 13, 1944, this time for a much more popular square milk bottle. He received Design Patent No. 139,331 for the new bottle shape on October 31, 1944. His final bottle patent was for a specialty (also called proprietary or deco) soda bottle (Design Patent No. 138, 663, August 29, 1944), also an apparent flop. Although Teunisz did not assign his patents to any specific firm, he was apparently involved with the Modern Top Milk Bottle Co., a firm that controlled the rights to the bottle. The company sold a franchise for the bottle to only one dairy in an area, competing with the more established Cream Top bottles. Lamb Glass and Owens-Illinois both made bottles of this type. See the Dairy Antique Site (2011) for more information.

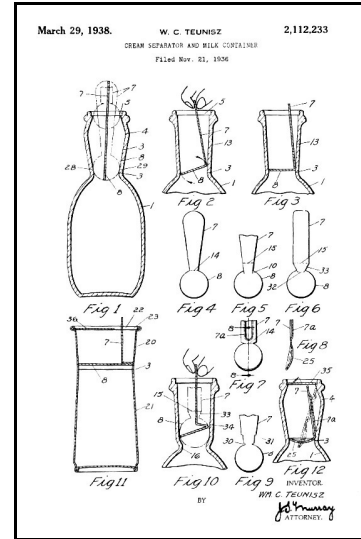


Figure 2-11 – Teunisz Modern Top patents

“Toothache” Bottle

A final variation, called a “toothache” bottle by collectors, had an exaggerated bulge to one side of the bulb (Figure 2-12). This style, however, is only found on square containers (Tutton 1994:44). Emile Sheemaeker applied for a patent for a square milk bottle with a bulbous neck that extended to one side on September 12, 1945, and received Design Patent No. 146,525 on March 25, 1947. Royden A. Blunt applied for a similar (but slightly different) design on July 24, 1951. He received Design Patent No. 169,959 on July 7, 1953. Blunt worked for the Buck Glass Co., the firm that manufactured these bottles, although Richer-Pour Bottle, Inc., was the organization that sold the containers. Both firms were located at Baltimore, Maryland, and Blunt was almost certainly associated with Richer-Pour.

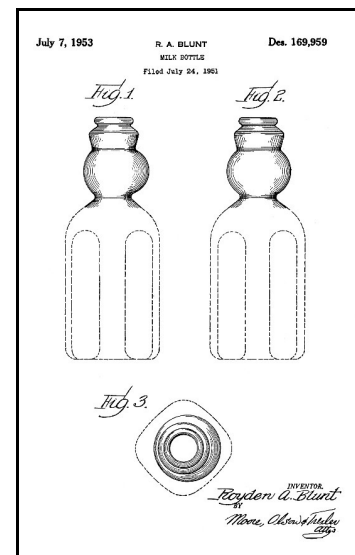


Figure 2-12 – “Toothache” milk bottle patent

End of the Cream Tops

Cream top bottles were used until at least the late 1940s and probably later. According to Gallagher and Munsey (1969:334), the cream top vanished because “homogenization did away with the problem of cream rising to the top of the bottle.” Although at least two of the standard cream top bottles were used in northern New Mexico, none have been identified from the southern part of the state.

Token Milk Bottles

On March 10, 1924, Edwin T. Alexander filed for a patent for a “Milk Bottle” and received Patent No. 1,554,191 on September 22, 1925 (Figure 2-13). This was the “token” milk bottle with an embossed slot for “a metal or fiber token” (Tutton 1997:7). The rationale for the container placed the cause for its invention on restaurants. During the 1920s, it was common practice to serve milk to customers in its original bottle. As the cap (often the only company identifier) was removed prior to serving, the token would then specify the bottler (Tutton 1994:34). As these bottles are quite scarce, they apparently achieved little popularity.

Henry Kart’s Bottle

Henry Kart designed a unique bottle style and applied for a patent on May 21, 1928. He received Design Patent No. 78,628 on May 28, 1929. The shoulder of the bottle actually begins one-quarter of the way up from the heel, and the rest gradual shoulder/neck extends the rest of the way to the cap-seat finish (Figure 2-14). Although these bottles do not seem to have gained much popularity, at least one was made in green color (*Milk Route* 2003:3).

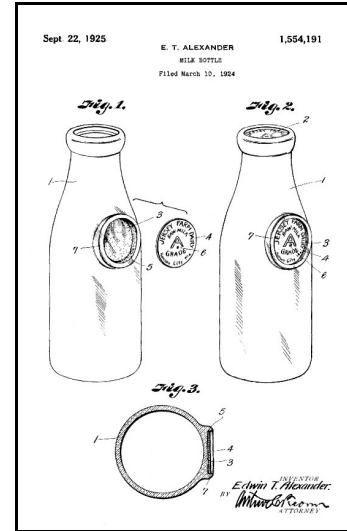


Figure 2-13 – “Token” milk bottle patent

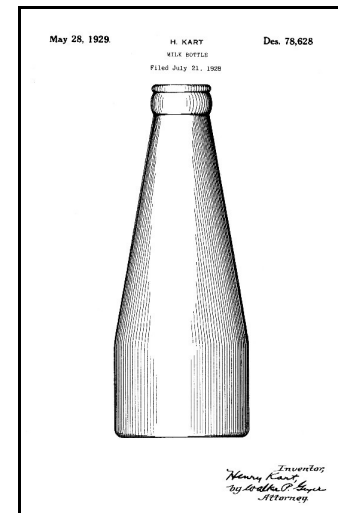


Figure 2-14 – Henry Kart’s patent

Cream Separator

George E. West invented a cream separator milk bottle that was very different from the cream top styles described above. West applied for a patent for a “Milk Bottle” on February 15, 1929, and received Patent No. 1,770,093 on July 8, 1930. Although the bottle was basically made in the common sense style, it became known to collectors as “the bottle with the dent” because of a sharp, horizontal indentation on one side of the body (Figure 2-15). The indented side was held upward while pouring to trap the cream while allowing the milk to flow freely out of the mouth (Giarde 1980:30). West assigned the bottle to Cream Separator Bottle, Inc., another sales firm. The bottles were actually made by the Lamb Glass Co., Liberty Glass Co., Thatcher Mfg. Co. and Reed Glass Co. For more information, see the Dairy Antique Site (2011).

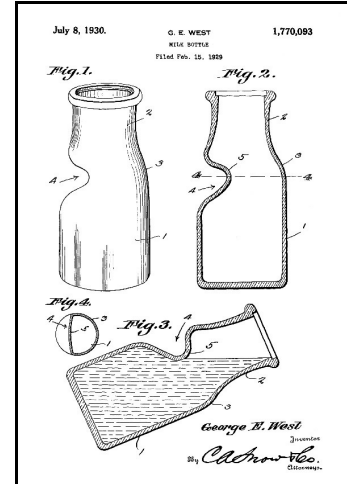


Figure 2-15 – Cream separator “dent” bottle

Arden “Easy Grip” or “Long Neck” Milk Bottles

Troy Darrell Lewis applied for a patent on May 20, 1939, and received Design Patent No. 118,500 for a “Milk Bottle” on January 20, 1940. The design had steep shoulders and a long, straight neck. Called the Arden “Easy Grip” or Arden “Long Neck,” the bottle was apparently used exclusively by the dairies at Arden Farms, a large, Western, regional dairy (Figure 2-16). Arden used the bottles from 1940 to 1946. The Owens-Illinois Pacific Coast Co. made the containers. The bottles were produced in half-pint, pint, third-pint, and quart sizes (Kammerman 1993:4).

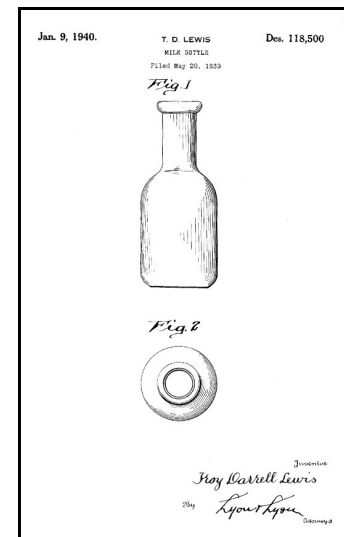


Figure 2-16 – Arden “Easy Grip” milk bottle

Square Milk Bottles

Nightingale

Charles T. Nightingale invented the first milk bottle that was square in cross-section. Nightingale applied for a patent on August 3, 1896, and received Design Patent No. 29,673 on

November 15, 1898, for a “Design for a Milk-Jar” (Dairy Antique Site 2011; Lockhart et al. 2011a:1-2). Note that Nightingale’s patent remained in limbo for over two years and three months. After the long wait, the bottle was never popular.

Blake-Hart

On January 13, 1925, Irva J. Blake and Harry N. Hart (both of Sacramento, California) filed for a patent for a “Bottle” that was also square in cross-section. The pair did not receive Patent No. 1,635,811 until July 12, 1927 – almost two years and seven months later, possibly because of the earlier Nightingale patent described above (Figure 2-17). The bottles were used by Blake’s dairy and Hart’s restaurants as well as other dairies in California and the surrounding states. Most of the bottles were embossed with the Blake-Hart logo – the word BLAKE embossed horizontally across a line drawing of a milk bottle, all inside a heart. The bottles were made from 1925 until as late as 1933, possibly a few years later (Lockhart et al. 2011a; 2011b; Tutton 1994:35; 1997:7), they were ahead of their time.

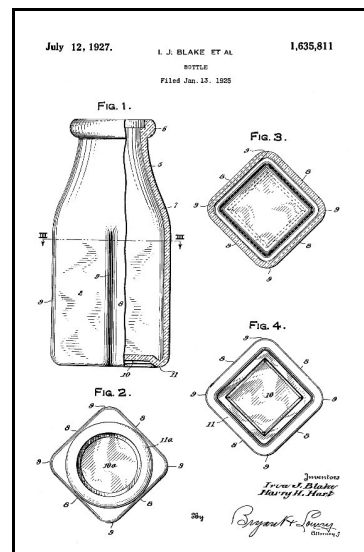


Figure 2-17 – Blake-Hart square milk bottle

Roy Blunt and the Buck Glass Co.

The first square milk bottles – that were successful in the long term – were designed by Royden A. “Roy” Blunt, the president of the Buck Glass Co. According to Giarde (1980:20), this was “the squat square milk bottle” that was called “the square or sometimes as the modern square” by the 1950s. As the patent drawing shows, however, Giarde was mistaken about the “squat” description. Dairy Antiques (2011) noted that:

Buck Glass Company of Baltimore, Maryland claimed that they had a square milk bottle in use at Alexandria Dairy Products Company of Alexandria, Virginia in October of 1940. This is the first use we have found reported of a modern, square milk bottle and Buck Glass Company claimed they were the originator of the square milk bottle in many of their later ads.

Royden A. Blunt applied for a patent for a “Design for a Bottle” on December 20, 1941, and received Design Patent No. 131,294 on February 3, 1942 (Figure 2-18). The subsequent history of the Buck square milk bottle – actually, the lack thereof – is astounding. The Buck Glass Co. seems to have expended its energy in the “toothache” cream-top bottles described above and failed to follow up on the “regular” square bottle market. Instead, that pathway seems to have remained open for one of Buck’s toughest rivals.

Handi-Square

The Creamery Package Mfg. Co., working with Owens-Illinois, designed its own square bottle in 1943 – completely independent of the Blunt bottle. Although it is unclear where the idea originated, Ed Reidel, president of the Cedar Rapids Dairy, ordered square bottles in the spring of 1943 and received them in July. Called Handi-Squares, the bottles were available in two quart, quart, pint, 1/3 quart, 10-ounce, 1/2 pint, and squat 1/2 pint sizes. New cases were designed to accommodate the square bottles, and the combination of the two allowed for the storage of ca. 45% more milk in a single truck. The bottles were lighter in weight and used the new “Econopor” finish that, according to one customer, “pours like a pitcher” (*Food Industries* 1944:83; *Milk Route* 1998d:1-2; *Modern Packaging* 1944:102).

The Owens-Illinois Glass Co. developed the Handi-Square milk bottles at the Toledo and Columbus plants during late 1943 and early 1944. The Clarion factory announced the availability of the new square bottles in its newsletter on June 17, 1944, and manufacture began at the plant on August 30. By 1946, production was in full swing (Figure 2-19).

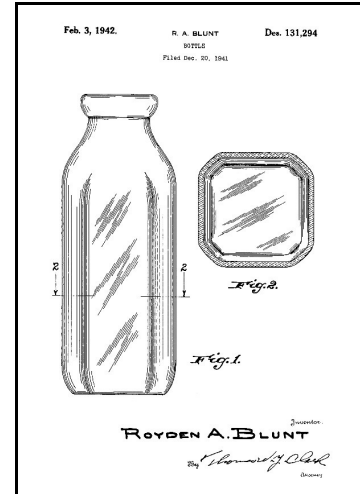


Figure 2-18 – Blunt square milk bottle

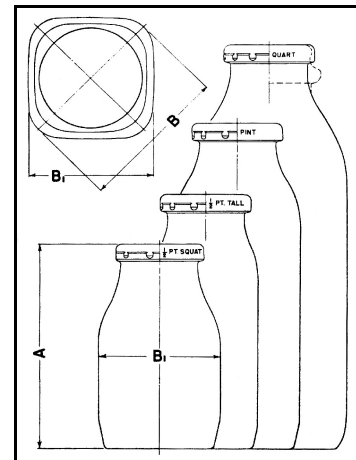


Figure 2-19 – Owens-Illinois 1946 drawing, Handi-Square milk bottle

The Teunisz Patent

William C. Teunisz applied for a patent for a square milk bottle on July 13, 1944, and received Design Patent No. 139,331 on October 31 of that year (Figure 2-20). The Teunisz patent was apparently not connected with the Owens-Illinois bottle, but there is no record of any other patent for the square bottle being assigned to either Owens-Illinois or Creamery Package.

Unfortunately, the Patent Office did not keep (or at least did not publish) records of failed patents. Both Buck and Teunisz had received *both* design patents and regular patents for their earlier ideas (including types of cream separators and bottles). Therefore, it is surprising that *each* received a design patent, but *neither* acquired a regular patent for the square milk bottle. The most likely explanation is that the Patent Office considered the *idea* for the square milk bottle to have already been patented in 1927 by Blake and Hart. However, variations on the *design* of the square bottle were still up for grabs.

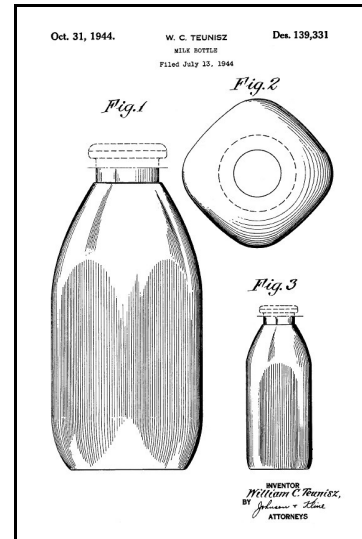


Figure 2-20 – Teunisz 1944 square milk bottle

In comparing the Buck patent drawing with that of Teunisz, there appear to be two differences, only one of which is probably significant. The Buck side view showed a tall, fairly slender bottle with rounded but well defined shoulders leading into a short neck. Teunisz included both a tall and a more squat shape in his illustrations, with a much more gradual slope to the shoulders. Both showed rounded heels. This is probably not very significant; actual bottles frequently have slightly different profiles than the patent drawings.²

The second difference, however, *may* have had a real significance. In cross-section, the Buck drawing showed a bottle with chamfered or squared corners. Teunisz, meanwhile, illustrated a cross-section with rounded corners. I have only observed rounded corners on square milk bottles, regardless of the manufacturer. While the side view of the shoulder areas of the

² Sometimes the profiles are *radically* different. For example, the original Root patent for the hobble-skirt Coca-Cola bottle had a very different shape than the actual bottle used by Coca-Cola (for more information, see Lockhart & Porter 2010).



Figure 2-23 – Cottage cheese tumblers, Price’s Dairy, El Paso

although few of these containers have manufacturer’s marks. Early caps were made from metal, but plastic soon became more popular. See Dairy Antique Site (2011) for other bottle shapes.

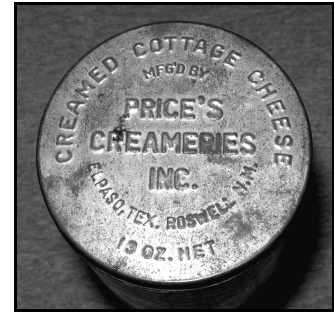


Figure 2-24 – Lid for Price’s cottage cheese tumbler

Orange Juice and Other Specialty Bottles

At some point (still to be discovered), dairies began selling orange juice and other fruit juices. These were packaged in special bottles (Figure 2-25). For examples, see *Milk Route* (2004:4-5). One popular fruit drink supplier was Green Spot, located in Los Angeles, California, in 1998. Although Green Spot was best known for its orange drink, the company also sold a grape drink, lemonade, and fruit punch. Bottles may be distinguished by their slightly constricted waists, often (possibly always) stippled, and by an embossed “Green / Spot” on a green “spot” or circle. The bottles were available in cap seat or Dacro finishes (*Milk Route* 1998a:3).

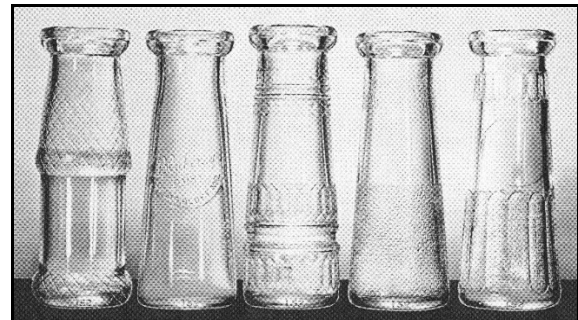


Figure 2-25 – Orange juice bottle (Lamb Glass catalog, ca. 1944-1950)

Color

Colorless glass was by far the most common hue in the production of milk bottles. Pitt (1918:21) explained that “if the bottles are poor in colour they are condemned as the slightest tinge of green in the colour of the bottle has the effect of making the quality of the milk look poor.” Pitt noted (1918:20) that many milk bottles in 1918 were made on O’Neill wide-mouthed semiautomatic machines.

Amber

Although the vast majority of milk bottles were produced from colorless glass, other colors were occasionally used. According to Tutton (1997:7), “amber milkbottles were used before 1900 and during the thirties.” Gallagher & Munsey (1969:335) placed one amber container at 1921. However, these containers were unusual. The earlier bottles can be identified by “a hand tooled lip, no cap seat and [used] a tin top.” These earlier containers mostly held buttermilk (Tutton 1994:25). Later amber milk bottles often held chocolate milk. These were often square in cross-section and were in use during the late 1940s and 1950s.

The Dairy Antiques Site (2011) also noted that a 1920 study showed that milk in amber bottles was less affected by sunlight than the product housed in more typical, colorless, bottles. The site also noted that amber bottles were used by some dairies to differentiate product types. With buttermilk, the amber color hid the tendency for the product to “whey” off or separate – which was visually unappealing to the customer.

Green

Green is another uncommon color that is occasionally found, although, according to Tutton (1997:7), they were used by less than 25 dairies nationwide. They were apparently used for eggnog during the Christmas holidays during the 1930s and 1940s, although Gallagher (1969:95) noted that the Reed Glass Co. manufactured a green Kart bottle (see above) in 1929.

Ruby Red and Cobalt Blue

A ruby red milk bottle was commissioned by the Borden Co. from Anchor Hocking Glass Corp. but was never actually used (Tutton 1997:8). A prototype, however, was made at the Connellsville, Pennsylvania, plant in 1950. Borden also commissioned red cottage chesses jars (Gottlieb 1998a:7). Although the Hotel Sherman College Inn (restaurant) may have served milk for cereal in half-pint, cobalt blue containers, it retains a unique notch in the annals of milk bottles (Tutton 1994:45). The bottles were mouth blown with tooled, cap-seat finishes. Two sides had scalloped indentations to provide a better grip. The bottles were embossed “HOTEL SHERMAN” on one side (Dairy Antique Site 2011). The only other blue milk containers are imitations.

Container Size

Generally speaking, dairy customers became interested in progressively larger milk containers as refrigeration technology improved. Oral tradition suggests that customers with poor quality ice boxes or no refrigeration were more likely to prefer half- or quarter-pint containers – although these were also used for cream. With improved ice boxes, pints became more popular; quarts became the norm about the time of the shift to mechanical refrigeration. With the advent of the supermarket and higher quality of refrigeration at all levels, half-gallon and gallon milk bottles became common, and their popularity increased with lighter weight waxed paper and plastic containers.

Despite this generalization, larger capacity bottles were available fairly early in milk bottle history. Thatcher’s turn-of-the-century catalog (1902:7) provided the information for the Table 2-1 which includes half-gallon bottles.

Table 2-1 - Sizes, Capacities, and Weights of Thatcher Milk Bottles - 1902

Size	Capacity (oz.)	Weight (oz.)
½ Gallon	64	40
3 Pints	48	33
Imperial Quart	40	30
US Standard Quart	32	26
Imperial Pint	20	18
US Standard Pint	16	15
Imperial ½ Pint	10	10
US ½ Pint	8	10
Imperial ¼ Pint	5	8
US ¼ Pint	4	8
Graduated Sterilizer	8	n/a

Very Small Sizes

As shown in Table 2-1, milk bottles came in a large variety of sizes, but this discussion will only center around U.S. standards, from smallest to largest. Creamers were made in at least two sizes, 3/4 ounce and 2 ounces, with the larger containers appearing as early as 1913 (Bindscheattle 1999:6). They were generally intended for restaurant use. See section on creamers for a more complete discussion. The gill or 1/4 pint size was also intended for cream, although some could have been used for small servings of milk. Taylor (1972:21) stated that “the advent of paper cartons in the 1940s brought [the manufacture of quarter-pint bottles] to a halt.”

Six-Ounce Bottles

At one time (currently unknown but after the adoption of pyroglazing in 1934), Borden used six-ounce “Fountain Service” bottle with red pyroglaze of a framed, outlined Saguaro cactus. These were the same height as similarly marked half-pint bottles, although thinner. The bottles were marked “Non-Deposit” (Gottlieb 1999:7). Like the 10-ounce bottles described below, these were obviously intended for on-premise use.

One-Third Quart and Ten-Ounce Bottles

Two unusual sizes, the 1/3 quart and 10-ounce bottle, were apparently also only used at restaurants and camps for a single-serving size of milk. Since 1/3 of a quart equals 10 2/3 ounces, the containers were essentially the same. The 10-ounce was almost always made in the typical pattern (like other Common Sense milk bottles), but the 1/3 quart bottles came in typical shapes and an unusual “squat” version (*Milk Route* 1998b:5). Ross (1939:360) clarified the issue in New York: “Where milk is sold in bottles to hotels, restaurants, or any place where the milk is to be consumed on the premises, a milk bottle one-third quart size is allowed.”

Half Pints and Pints

As discussed above, half-pint and pint sizes were heavily used when refrigeration was unavailable or substandard. However, half-pints (and, sometimes pints) eventually replaced 10-ounce bottles as the single-serving standard, a trend in the U.S. toward larger and larger portions

of food and drink. By the time waxed-paper cartons began edging glass bottles toward irrelevance, the half-pint or pint was the standard for schools. Aside from school and restaurant use, the half-pint and pint containers gradually lost popularity and were replaced by quarts.

During the early 1900s, Borden used a tall, thin pint bottle with a typical, cap-seat finish. These bottles were the same height as quart bottles but only about 1/3 the diameter. One collector speculated that the purpose might have been to use the same filling machinery as was used on quart bottles (Gottlieb 1998b :6). The idea apparently died out fairly quickly.

Quarts

For most of the 100+ year history of the milk bottle, the quart has been the standard. Although other sizes have been used throughout the period, the mainstay for the industry and for most families was the quart. It was not until the increasing reliance on bulk buying during the last quarter of the 20th century that larger-capacity bottles began edging the quart out of its leading role.

Larger Sizes

Increasingly, by the end of the 20th century, larger sizes of almost everything – including milk – have become more popular. The half-gallon size became one of industry standards, although some families preferred even larger sizes. Periodically, some dairies have used even larger containers (multiple gallons), but these were never as popular.

Standardization

Wellinghoff (1940:288) noted that:

Early in the 20s a definite move was made towards standardization in the milk bottle industry—standardization as to cap size, height of bottle body diameter etc.; with the resulting effect that a 9½-inch height for the quart, a 7¼-inch height for the pint, and a 5¼-inch height for the half pint was adopted. . . . The quart bottles that were abnormal in height, such as the 9 ¾-inch, 9 7/8-inch and in a few cases even a freak 10-inch were pretty well abandoned.

Although this became complex, a 1924 study found that glass houses made quart bottles in 12 varieties; pints in 13; half-pints in 14; and quarter-pints in 10 varieties. The Division of Simplified Practice of the Department of Commerce recommended a reduction to three varieties of quarts, three pints, and three half-pints. The quarter-pint size was to be eliminated. Fifteen milk bottle manufacturers agreed to the size restrictions (*Glass Industry* 1924:80-81).

A joint conference between the International Association of Milk Dealers and the Glass Container Association set standards for milk bottle sizes. The group established the G.C.A. No. 500 Glass Finish for milk bottles, setting precise measurements for the cap seat and roll of the finish. In addition, standardization was adopted for two sizes of quarts, one size for pints, and one size for half-pints. The quarter-pint bottle was eliminated. The joint conference expressed the hope that “before the close of 1928 every dairy and milk distributor will be purchasing and every glass manufacturer will be producing milk bottles following these standards” (*Glass Container* 1927:11, 32).

The Glass Container Manufacturers Institute (GCMI) further regulated milk bottles on September 9, 1947, and the National Conference on Weights and Measures unanimously adopted a new milk bottle code in September 1946 that standardized milk bottle sizes. The standardization was formally approved on July 29, 1947. The conference allowed glass houses a grace period, however, to facilitate wearing out old molds prior to adopting the new measures (Doucette 1982:443-444, 447).

Creamers



Figure 2-26 – Round creamer

Manufacturers made creamers in at least two sizes (3/4 and 2 ounce), with the larger size being used earliest, by at least 1913 (Figure 2-26). The vast majority of the later creamers were made by the Owens-Illinois Glass Co. at either Plant No. 9 (Streator, Illinois) or Plant No. 12 (Gas City, Indiana). Companies, like the Travis Glass Co. and Owens-Illinois, made sample creamers with the company name embossed (in earlier creamers)

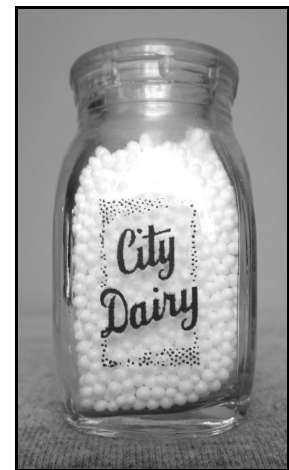


Figure 2-27 – Square creamer

or in pyroglaze (on later ones) on the body of the container (Bindscheattle 1999:6). During the 1940s, when the square milk bottles evolved, glass houses also began to make square creamers (Figure 2-27).

Manufacturing Techniques

Mouth-Blown in Mold

The basic principle behind this technique is as old as bottle making. A gaffer (blower) gathers a gob of glass at the end of a punty (blowpipe) and blows it into a ball. He then rolls the ball into a cylinder on a “table” – creating a sort of blank shape called a parison. He inserts the parison into a mold that has two side leaves and a baseplate. A mold boy closes the mold, and the gaffer blows the bottle into its final shape.

An assistant grasps the body of the bottle with a snap case, and the gaffer wipes water around the end of the blowpipe – to make the glass brittle at that point – and breaks the bottle loose from the blowpipe. The assistant reheats the bottle neck in the furnace and creates the top end of the bottle – appropriately called the finish – with a “lipping” or finishing tool. See Lindsey (2011) for a more thorough description.

This technique creates a series of identifiable characteristics on milk bottles made by this method. These are most notable at the base and finish. The finishes of all mouth-blown milk bottles were tooled – i.e., made by the insertion of a tool into the neck of the still-hot bottle and around the outer edge of the neck. The tool was then squeezed to the proper diameter and turned to create the finish. This erased the side seams that were created by the mold – at least in the area below the finish that was touched by the tool. Thus side seams end relatively abruptly – although with a taper at the top – sometimes with a slight lean to one side where the tool pushed the seam while turning. The process of turning also created tiny horizontal striations in the glass. The process does not leave *any* horizontal seam of any kind on the neck or finish (Figure 2-28).

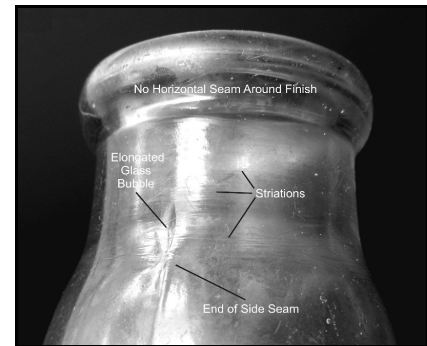


Figure 2-28 – Finish created by mouth-blown process

The base was almost always created by a cup bottom of the mold. This leaves a horizontal seam at or just above the heel of the bottle. In some of the earliest bottles, the mold may have had a post bottom, leaving a circular, even, and distinct seam that is centered on the base. Some of these bases had concave indentations. An important characteristic of these seams is that they are centered; the other techniques described below rarely leave a centered scar (Figure 2-29). See Table 2-2 for a summary of characteristics.

Table 2-2 – Characteristics Created by Milk Bottle Manufacturing Processes

Technique	Neck/Finish	Base	Date Range
Mouth	Side seam ends abruptly at neck; horizontal striations; no horizontal seams	Cup base; no off-center machine scar	1878-ca. 1920
Press & Blow	Side seam fades out at neck; a single horizontal seam at center of finish roll; washboards	Cup base; off-center ejection or valve scar (poss. letter or number)	ca. 1890-1990s?
Owens	side seam continues through finish; horizontal seam just below finish	Cup base; off-center feathered Owens scar	1905-1926

Press-and-Blow Machines

The earliest semiautomatic bottle machines – called press-and-blow machines – mimicked the mouth-blown process – with one *major* exception: the finish was created first. The machines used compressed air instead of human lungs and had two sets of molds. A gatherer dropped a gob of glass into the parison or blank mold, and a plunger pushed the glass against the sides of the mold, forming the finish and creating an elongated inverted cone with a short hollow at the top (Figure 2-30 – note in the figure that the finish is fully formed, including the seam encircling it).

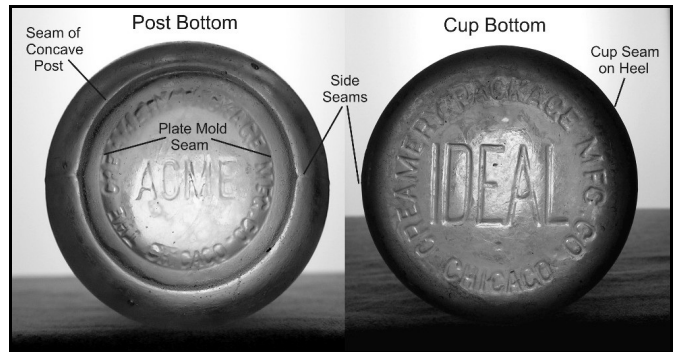


Figure 2-29 – Base created by mouth-blown process

The parison or blank was then pushed up by the valve or ejection rod and was transferred to the blow mold (or final mold), where a puff of compressed air blew the container into its final shape. With the invention of gob feeders in 1915 and 1916, the machines became fully automatic. Because the only change was in the way the glass was gathered, there is no way to tell any difference between a milk bottle (or any other wide-mouth container) made by this method on a semiautomatic or fully automatic machine. For more details, see Lindsey 2011).

When the bottle was transferred from the parison mold to the blow mold, the finish and neck cooled sufficiently that the final mold seam did *not* extend up to the finish. Since the extension of the neck seam to the finish is one of the generally assumed characteristics of automatic machine manufacture, this has baffled occasional researchers who were not familiar with milk bottles. The important difference with



Figure 2-31 – Finish created by the press-and-blow machine process

press-and-blow milk bottles is that the side seams gradual fade away – rather than the more abrupt termination described in the mouth-blown process. In addition, the press-and-blow system creates a horizontal seam that encircles the roll of the finish. This seam is absent from the earlier, mouth-blown bottles. Finally, the horizontal striations described in the mouth-blown section are not present on machine-made bottles (Figure 2-31).

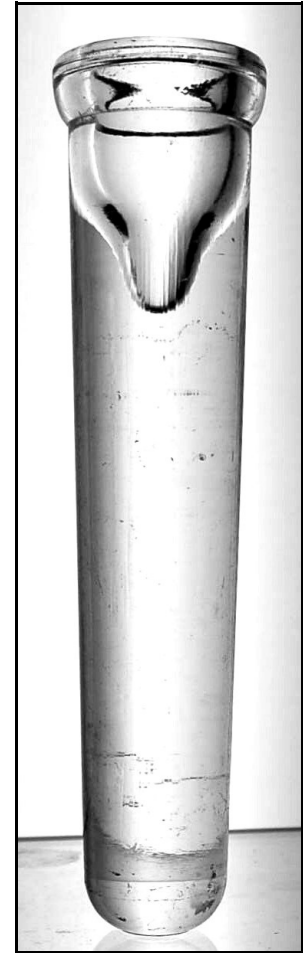


Figure 2-30 – Parison created by the press-and-blow machine process (Courtesy of Jay Hawkins)

Another neck characteristic is usually present. Known as “washboards,” these are wavy horizontal lines that are obviously unintended. These are usually fairly faint and may show up at various places around the neck, sometimes almost encircling it. Washboards are caused by uneven heating between the intentionally cooled finish and the heated body during the transfer from the parison to the blow mold (Figure 2-32).



Figure 2-32 – Washboards on neck created by the press-and-blow machine process

The major basal characteristic on these bottles in the ejection or valve scar. The parison mold for milk bottles creates a parison or blank that is in the shape of an inverted cone – with a rounded base – below the finish. This blank is ejected

from the parison mold by a valve that pushes it up to be grasped and transferred to the final mold. The valve leaves a distinct, circular scar on the base. These vary in diameter but are rarely centered on the bottle base. Some bottles had letters, numbers, or both embossed in the ejection scar, often in mirror image. Some glass houses used these ejection valves for date or plant codes (Figure 2-33). See Table 2-2 for a summary of these characteristics.

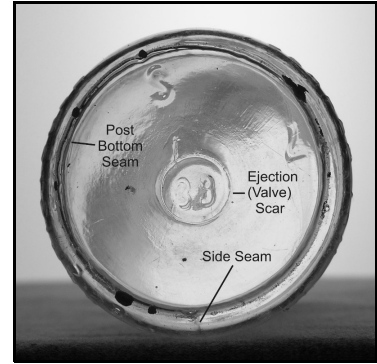


Figure 2-33 – Base created by the press-and-blow machine process

Owens Automatic Machines

In 1904, the Thatcher Mfg. Co. was one of the first to receive a license for the newly patented (late 1903) Owens Automatic Bottle Machine and was the only glass house allowed to use the Owens machine to make milk bottles (Lockhart et al. 2007:55). The Owens machines were slow to become the industry standard because of the Owens leasing arrangement. Obtaining an Owens lease was a complicated process, and few early 20th century bottlers could comply with the necessary procedures. By the time the Owens patents expired, the machines were mostly outmoded, and glass houses were courting other suppliers – Owens was now making glass containers. See Lockhart et al. (2010) or Miller & Sullivan (1984) for discussions of automatic bottle machine use).

The basic method of the Owens machine used the same principles discovered during the mouth-blown days; it still relied on a parison and blow (or final) mold. However, there were notable differences. First, the Owens machine sucked the glass into the parison mold, then cut it off with a knife that then became the baseplate. The parison was formed as a mostly solid glass object with an opening blown into the top. These machines were called blow-and-blow machines to distinguish them from the press-and-blow method described above. The parison was then transferred into the blow mold and blown into its final shape.

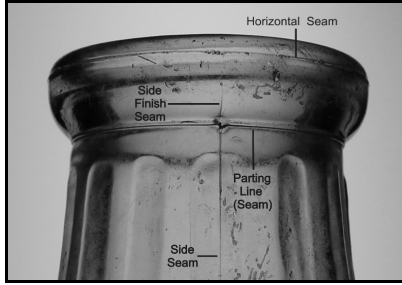


Figure 2-34 – Finish created by the Owens blow-and-blow machine process

This technique created yet another set of characteristics. At the finish, the side seam continued through the finish and usually over the top of the lip, terminating at the edge of the throat or bore of the bottle. The very top lines were occasionally fire polished off, but that was atypical. The Owens machine

created the finish with several mold parts, so there will generally be both horizontal and vertical seams, the most notable of which is a horizontal seam (called a parting line) that encircles the bottle neck just below the finish (Figure 2-34). The Owens bottles frequently have “ghost” seams on the sides. These were created by the parison mold (Figure 2-35). These seams have tremendous variation, including some where a seam rising from the heel does *not* meet the seam descending from the finish. Ghost seams appear to be less common on milk bottles than on many other types.

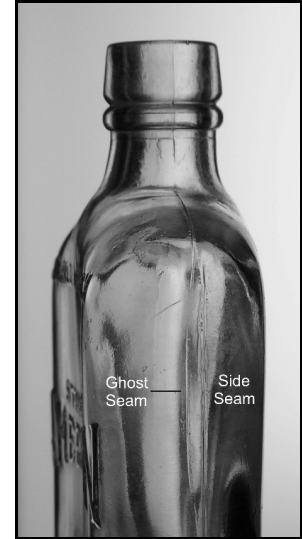


Figure 2-35 – Ghost seams



Figure 2-36 – Base showing Owens machine scar (California State Parks collection)

The use of a blown parison mold creates an off-center scar on the base of the final bottle. This is true with both Owens machines and later press-and-blow machines. The scars can be faint or distinct, but they are always off center, and the vertical side seams often extend to them.



Figure 2-37 – Base showing later machine scar

Sometimes the ghost seams connect to the machine scar on the base and the more distinct seams connect to the finish. The main difference with the Owens machine is that the basal scar is usually “feathered.” The feathering is often a set of tiny lines that extend from one side of the scar, although they can follow other patterns as well (Figures 2-36 and 2-37). See Table 2-2 for a summary of characteristics.

Labeling

Paper

Although the earliest and probably most common method of marking bottles was the paper label, few of those remain on bottles that have been buried for any length of time. Very few paper labels were known to have been used on milk bottles. The few that were used were mostly for special purposes or promotions.

Embossing

The earliest durable labeling was blown into the bottle, itself. Embossing consists of raised letters, numbers, and designs that extend above surface of the glass. From the earliest milk bottles in 1878 to the initial use of enameled lettering, called pyroglazing by the Thatcher Glass Mfg. Co., in 1934, embossing was the primary method of labeling on any dairy containers. The embossing on most milk bottles was simple, usually only consisting of the name of the dairy, city, and state –

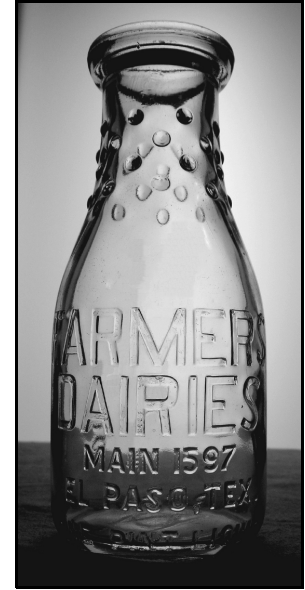


Figure 2-38 – Embossed milk bottle from Farmers Dairy, El Paso

and not always all three of those! Later dairies sometimes had more elaborate messages, slogans, or drawings embossed in addition to the basic information (Figure 2-38).

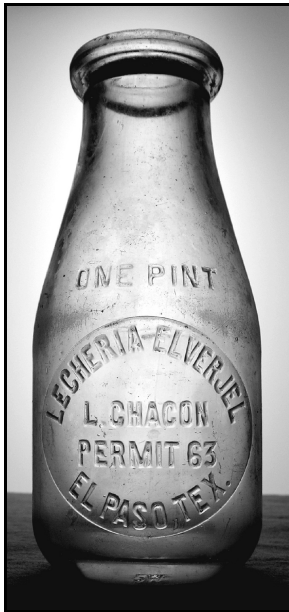


Figure 2-39 – Typical embossed plate

Plates

Plates or plate molds (often called slug plates by collectors and in some catalogs) were circular, oval, or horseshoe (often called “tombstone-shaped”) plates placed in the bodies of regular molds (both hand-blown and machine production). These enabled a customer to use a standard bottle design and personalize it with the dairy name and other information without having to pay the cost of having a full mold engraved. I have not encountered horseshoe-shaped plates on milk bottles, and circular plates seem to be more common than ovals (Figure 2-39). Although this style of labeling had deteriorated in popularity by

1920 in most other types of bottles, it remained the industry standard for milk bottles until the late 1930s or early 1940s when it was replaced by pyroglazing, although, in some vicinities (e.g. El Paso), the use of embossing continued until the common usage of the square bottle in 1949. In isolated cases, the use of the round bottle with a plate mold persisted until the late 1980s.

The Thatcher Manufacturing Co. catalog of 1902-1903 provided a great deal of information on plate molds used on their milk bottles. Thatcher called the molds “name plates” and offered them to customers at \$1.00 each and “8 cents per letter” with prices for illustrations depending to the complexity of the design. Diameter of the plates varied according to bottle size: “3½" for quarts, 3" pints, 2½" halfpints, 2¼" quarter pints” (Thatcher 1902:3). The Creamery Packaging Mfg. Co. warned its customers that “six weeks is the usual time required to execute an order for lettered bottles” (Tutton 1994:183).

Pyroglazing

The “painted” label process that was adapted for use on glass bottles was generally called by different names by soda bottle and milk bottle collectors. Soda bottle collectors adopted the name Applied Color Lettering (ACL), originated by the Owens-Illinois Glass Co. The Thatcher Manufacturing Co., a leading maker of milk bottles, identified its technique as Pyroglazing, a name which came into general use for the process by milk bottle collectors.

Although 1934 is the year generally recognized as the beginning of ACL usage in soda bottles, Rawlinson (1970:13) suggests that pyroglazed milk bottles were available as early as 1931.³ Giarde (1980:154) refuted Rawlinson but placed the starting date as 1933 and noted that the English glass industry preceded the U.S. by introducing pyroglazing in 1929. Pyroglazed milk bottles were typically labeled with a single color, generally orange or red (Figure 2-40). Brown or

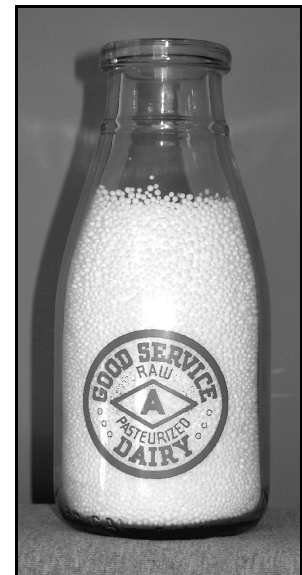


Figure 2-40 –
Pyroglazed bottle

³ This was almost certainly a typographic error, although Rawlinson may have discovered a reference to the development of the process. The December 1930 Owens-Illinois Glass Co. catalog illustrated ACL bottles, showing that the process was in development at least that early.

black are found but were less common. Bichrome containers usually used combinations of red/black, orange/black, green/black, or green/red (Tutton 1992:1; 1997:9). Tutton (1997:174) included a chromatic chart of available pyroglaze colors.

Tutton (1992:1) described the pyroglaze process:

a stencil moves into position across the milkbottle which turns and is printed. A wedge-shaped rubber squeegee forces the glass paint through the silk-screen stencil. The glass paint is a pigmented mixture of oils and waxes with inorganic powders which matures into a glossy impervious color at temperatures of over 1000°F which is then permanently fused into the glass. The milkbottle is then annealed for about 3 hours.

Etching



Figure 2-42 – Hand etching

Etching was generally an aftermarket labeling method on milk bottles, although it was a typical decorating technique for some forms of tableware. With acid etching, a stencil was placed against a milk bottle and acid applied to the stencil. The result was a frosty lettering. This was used, for example, by the early Massachusetts “sealers” – local officials who measured the capacity of each milk bottle and either etched that the bottle was OK or that it was condemned (Figure 2-41).



Figure 2-41 – Acid etching (Al Morin collection)

A second type of etching was done with a hand or machine-powered tool that used industrial grade diamonds to roughen the surface of the glass – producing an effect similar to acid etching, although usually not as neat or attractive. This method was used by individual dairies in areas where new laws required that each bottle

be indelibly identified by the dairy’s name. Many of the smaller dairies – that had always used unmarked bottles – merely purchased a hand engraving tool and etched the dairy name on all the bottles – sometimes with incredibly crude lettering (Figure 2-42).

Labeling Laws

Local laws requiring that individual dairies label their bottles with the company's name began around the turn of the century. Thatcher's catalog (1902:7) noted that "the custom of requesting the design of a name plate is becoming necessary in large cities where special laws are inaugurated to enable owners to identify and claim their property wherever found, and in some cities Milk Dealers' Associations provide collectors to reclaim and return name plate bottles with very profitable results."

Reproductions

Reproductions of some of the more popular (with collectors) milk bottles are fairly common. These can be made in almost any color including green, blue, cobalt blue, pink tint, and amber. Some are even made from milk glass or ceramics (see Tutton 1997:79). Although these are unlikely to show up in excavations, some may appear in more recent stratigraphic levels.

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