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*Metropolitan Museum of Art*

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# THE AMERICAN COACH LACE INDUSTRY

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## Introduction

Coach lace is a trim used almost exclusively in the upholstery of carriages and coaches. The names "coach lace" or "livery lace" were used consistently throughout its manufacture. The robust looped wool pile created by a supplementary warp, was a variation of velvet similar to Brussels carpeting and makes this trim easily identifiable.

This paper examines the manufacturing of American coach lace from the mid-18th century until its demise in the 1930's. Coach lace is a textile little recognized today. The prevalence and context within which it existed and how coach lace adapted to new forms of transportation, technology and production organization will be explored.

Business records, census records, city directories, government reports, patents, textile directories, and carriage and automobile journals were some of the records consulted. Objects were sought and examined such as textile samples, carriages, coaches, train passenger cars and automobiles that retained their original upholstery and had provenance.

The story of American coach lace production is necessarily hinged to the production of carriages. Carriages as a mode of transportation relied on a network of roads and the means to afford the purchase and maintenance of the vehicle. The roadway system that developed during the 18th century that resulted in increased communication and a more rapid exchange of technology and goods.<sup>i</sup>

By the end of the 18th century, the rise of a financially solid agricultural and merchant class coupled with the increase in manufacturing, made the acquisition of a vehicle for moving small groups of people, not just goods, affordable and desirable. By the mid-19th century, the market demand and the technological developments had made the coach and carriage industry one of the largest industries in the United States.<sup>ii</sup> The means of transporting people expanded into railroads during the 1830's, automobiles by the 1890's and airplanes after W.W.I.

The production of coach lace was found to occur in three forms: individual weavers, the "family way", and with the inception of the power loom, the factory system. The term "family way" was used in the 1790's to denote a business structure in which one individual provided the space, looms and tools and employed local community members to work on a piece rate basis.<sup>iii</sup> These three production structures in conjunction with economic, technological and geographic factors, sort the manufacture of coach lace into four time periods; up to the 1790's, the 1790's until 1837, from 1837 to the Civil War, and the post-war period until the 1930's.

## Function and Use

As a trim, coach lace had both a utilitarian and decorative role in the upholstery of vehicles. The function of coach lace in carriages was the same as trims on furniture -

it hid the tack heads for the upholstery attachments. Although decorative gilded or brass nails could be used instead of iron tacks, this was more expensive than a textile trim.

Coach lace was woven in several widths with one or both of the selvages extended in a plain weave. These extensions or "tapes" were turned back under the lace. Trimmers (as vehicle upholsterers were known) used these tapes to tack into and then the lace was folded down over the tacks and adhered in place, covering the attachment.

The types of lace were variously known as binding lace, pasting lace, seaming lace and broad lace. Binding lace was narrow with one tape which was used to bind the edges of the falls, pockets and linings. Pasting lace was also narrow, about 1/2", with a tape of the same width. Broad lace was much wider and was used in the door panels, falls, handholds and cushion sides. Broad lace was woven with elaborate patterns while the smaller tapes had an abbreviated design in coordinating colors.<sup>11</sup>

Coach lace continued to be used in automobiles similarly to its use in carriages, but did not find a large use in railroads and was never used in airplanes. The market for coach lace declined when the upholstery techniques developed for metal-framed automobiles no longer made it functional. The decorative element remained important until modern industrial design dominated the interiors.<sup>12</sup>

### Looms and Structure

An extant coach lace handloom has not yet come to light, but the hand weaving of European coach lace was illustrated in Diderot's encyclopedia including the wires that created the warp pile. The pattern selection mechanism was crucial to reducing the time in the hand-weaving process, making weavers interchangeable, and the product error-free. Diderot's illustration depicted a loom that could be both a passementerie and coach lace loom with a large number of treadles, suggesting a foot-controlled patterning mechanism.

The first coach lace power loom replicated the hand-woven product with a full width warp pile structure. Three known patents were issued specifically for coach lace looms. The first patent was issued to W.G. Barnet of Newark, New Jersey on November 18, 1825.<sup>13</sup> His patent was not restored after the U.S. Patent Office fire and its content remains unknown.

The second patent was assigned to Erastus B. Bigelow, of West Boylston, Massachusetts on April 20, 1837, Letters Patent No. 169.<sup>14</sup> Bigelow specified that the "mechanical contrivances" described will "perform the entire operation of weaving coach-lace, &c., by water, steam, or other rotary power". Bigelow's patent described the operation of his coach lace loom, including the use of a Jacquard mechanism for controlling the pattern. He stated that he had "...invented new and useful improvements in looms to weave coach-lace and such other similar wrought fabrics as may be woven by the said machinery, which improvements combined are denominated 'Boyleston's Power Coach-Lace Loom,'".

Bigelow patented six features. Five concerned the operation of the figuring wires. The sixth was the use of stationary shuttle boxes (conventionally power loom shuttle boxes were extensions of the beater and the entire unit moved forward to beat-up the weft). The patent drawings clearly showed a Jacquard mechanism for pattern selection.

The third and last patent for a coach lace loom, No. 10,096, was issued to James H. Murrill of Richmond, Virginia on October 4, 1853.<sup>viii</sup> Murrill also mentioned the use of a Jacquard mechanism, but the drawings do not depict it nor was the power source noted. Murrill also claimed six features, but only two had to do with improvements in the figure wires. Two more were for stop motions and the last two were adjustments in the stationary shuttle box and harnesses. The smooth function of the pile wires appeared to be the most problematic issue for automated weaving.

### Manufacturers and Business Organization

For the nearly two hundred years of coach lace records located and examined, the manufacturing organization fell into one of three modes: the individual weaver, the "family way", and a factory system using either only power, or a power and hand combination. The individual and family way of manufacture existed side-by-side throughout the production of coach lace until the early 20th century.

Eighteenth century coach lace weavers names were found primarily in newspapers<sup>ix</sup> and most are thought to have been individuals in business, although this is difficult to affirm. Thomas Ryder cited an ad in the May 5, 1743 Pennsylvania Gazette for James Osborn, who advertised as a "Lace-Weaver, from Dublin, makes and sells all sorts of coach and saddle fringe, chaise-reins, Women's Bridle reins, livery lace, shoulder Knots for Gentlemen's Servants", claiming Osborn to be the earliest coach lace reference.<sup>x</sup> The last listing found for an individual weaver was that of John A. Raab of Camden, New Jersey in the 1905 Dockhams. Raab was listed as having "3 (narrow hand) looms".<sup>xi</sup>

The "family way" was a form of production described by two early 19th century coach lace producers, Henry Korn of Philadelphia and Wilson Marsh of Quincy, Massachusetts. In 1809, Wilson Marsh listed ten looms on his premises, where he also describes some farming going on, indicating a more rural environment.<sup>xii</sup> The later business records list the names of several women and a few men wove for him. Their variable monthly pay suggested that the weavers established their own schedules and worked when it was convenient for them, often continuing in this manner for several years. Korn described a similar situation in the urban setting of Philadelphia.

In the last half of the 19th century, the hand weaving of coach lace continued in New Haven and Bridgeport, Connecticut, but the records do not exist for gender or schedule comparisons. In New Haven, Laban Pardee and later his son Charles, were listed in the 1888 Dockhams as having "20 handlooms", a quantity indicating employees.<sup>xiii</sup> The Bridgeport city directories in the 1870's had the occupation "coach lace weaver" following several names, but a few were listed as "manufactory", indicating a larger enterprise, perhaps similar to Pardee's.<sup>xiv</sup>

The third form of production began with Erastus Bigelow's invention and patent for a power coach lace loom and the building of the Clinton Mill in Clinton, Massachusetts in 1837. Power looms were not limited to large mill settings, but also occurred on a smaller scale. Joseph Naul in Brooklyn, New York was first found listed in the 1888 Dockhams, with the last listing in the 1901 Davisons. He had "11 power looms" and made "Cords, Braids, Carriage and Upholstery Trimmings".<sup>xv</sup>

### Time Periods in the Production History

The coach lace industry fell into four distinct time periods: up to the 1790's, 1790's to 1837, from 1837 to the Civil War, and the post-war period until it ceased production in the 1930's. Each period is characterized by similarities in the groups of manufacturers that produced coach lace, as well as the influences of outside factors such as economic factors and technology.

In the first time period through the 1790's, newspaper advertisements were the primary source of locating the names of coach lace weavers. These advertisements often included the weaver's country of origin, suggesting recent immigration. The coach lace weavers came from Germany, France, Holland, England and Ireland and began by setting up business in urban centers, primarily Philadelphia and New York. A wide range of products was offered by these weavers and might include a combination of carriage trimmings, military trimmings, ladies trimmings, hat trimmings, furniture trimmings, cords, tassels, and fringes in addition to coach lace.

The second time period, the 1790's through 1837 are marked by the encouragement of the fledgling republics' manufacturing endeavors. Tench Coxe notes in his A View of the United States, that carriages and coaches are being made here, as well as the accoutrements, such as coach lace, and other components.<sup>xvi</sup> The 1823 business census and Louis MacLane's 1833 manufacturers census suggest that coach lace weaving had become a more specialized business and had diffused from the urban centers.<sup>xvii</sup>

That local citizens took up some of the specialized skills of immigrants seems possible in the case of Wilson Marsh. Located in a more rural environment, the fifth generation American, Wilson Marsh of Quincy, began making coach lace sometime in the 1780's. By 1797 he built a house with a shop for his coach lace business. Although Marsh occasionally provided other textiles services, such as dyeing, during times of economic downturn, the business concentrated on coach lace. The Marsh records indicated that farming continued through the 1820's, much of it to produce raw materials required for the weaving business, such as flax and wool.<sup>xviii</sup>

During this period, the urban centers with concentrations of coach lace weavers began to solidify. Newark, New Jersey became a center for coach lace weaving by the early 1800's, according to the preface in the 1835-6 Newark city directory.<sup>xix</sup> Rarely in the ads or listings for Newark's coach lace weavers do the products extend beyond carriage trimmings.

Philadelphia, already an established textile center by the late 18th century, had Henry Korn who testified for an 1820 hearing on the state of coach lace manufacture after the War of 1812, and William Horstmann who arrived in 1816 and established a large coach lace and military trims manufactory. Several other weavers of coach lace are listed in advertisements.

In 1837, B.K. Mills established a coach lace hand weaving business in Bridgeport, Connecticut. This business became quite large and established Bridgeport as one of the centers for coach lace weaving.

The year 1837 marked the end of an era on two fronts and the beginning of the third time frame that ended about the Civil War. The banking crisis of 1837 caused a severe economic depression and marked the end of the Marsh business, which lingered another four years as the family shifted into the leather and shoe business. In that year, Bigelow patents a coach lace power loom and the factory in Clinton, Massachusetts begins production within two years.<sup>xx</sup> The factory system for coach lace production commenced. With an outside power source, the mill needed a scheduled daily work force. This production form existed side-by-side with the individual and family way, and the period between 1837 and the Civil War was a time of industrialization.

The final era commenced following the Civil War, and is characterized by several events. During this period, the first generation of power coach lace manufacturers gave way to another generation. Although Bigelow pioneered power coach lace weaving, he sold his mill to William Horstmann in 1857, who was already weaving coach lace and who was reported to have introduced the first Jacquard mechanism into the United States in 1824 to weave coach lace.<sup>xxi</sup> The firm of Flynn, Emrich and Murrill in Baltimore, also a power weaving coach lace factory from at least 1853, dropped the coach lace weaving end of their business in 1862 and concentrated on manufacturing machinery and being machinists.<sup>xxii</sup>

A second hallmark of this last era was the further concentration and growth of power coach lace in Bridgeport, Connecticut, and Rochester, New York. B.K. Mills, an immigrant from London, had begun a hand-woven coach lace business around 1837 in Bridgeport and by the late 1860's had introduced power looms. In 1878 Mills incorporated to become Bridgeport Coach Lace Company.<sup>xxiii</sup>

During the 1880's, Rochester, New York had several power woven coach lace businesses. Albrecht Vogt had his hand in three concerns at different times; the Rochester Coach Lace Company, the Union Textile Manufacturing Company and Vogt Manufacturing and Coach Lace Company. Schaefer and Schlegel started in 1888 and shortly became the Schlegel Manufacturing Company.<sup>xxiv</sup>

In the late 1860's, New York City became the site of a power coach lace concern that was started by two employees of the Bridgeport Coach Lace Company, William Boston the former manager, and F.J. Schmid. When Schmid died in 1902, the company of Boston and Schmid was bought out and became the New York Coach Lace Company.

Newark and New Haven remained strong hand-woven coach lace centers through the end of the 19th century. The end was heralded by the changes in company names; in 1929 the Vogt Manufacturing Company dropped "& Coach Lace" and around 1937 the Bridgeport Coach Lace Company became Bridgeport Fabrics. While the depression took its toll, Vogt Manufacturing Company and Bridgeport Fabrics continued into the 1950's. Schlegel is still in business today manufacturing primarily photocopier brushes and window gaskets.<sup>xxv</sup>

### Other Uses

Through the end of the 18th century, coach lace was also put on livery, that is the costume or uniform worn by the footman and coachman. The European tradition of family colors and crests were woven into the coach lace and used on the livery and

vehicle to identify its occupants. The practice of livery lace carried over into this country. Livery uniforms are in the costume collection in Williamsburg, and the Metropolitan Museum of Art.

Coach lace was used on other objects occasionally, but never found much of a market. In 1881, Constance Cary Harrison in The Woman's Handiwork in Modern Homes urges "COACH TRIMMINGS in dark, rich hues make an excellent finish to velvet or plush lambrequins".<sup>xxvi</sup> Occasionally objects (seating furniture, wall hangings, and paneled screens) are found in collections that have coach lace applied.

### Coach Lace Use in Other Vehicles

By the 1830's, trains became an additional mode of transportation. At first train passenger cars were built by carriage makers and were composed of a sequence of smaller compartments, the seats facing each other, with doors to the outside between the seats. In America, with the vast distances to cover and the large numbers of people to transport, the long car was quickly opened up and the seats were aligned in rows facing the front like church pews. The seating became a separate unit attached only to the floors of the train cars. The high volume use required ease of maintenance and durability. Trims of any sort on the seating quickly vanished in favor of metal strip fasteners.<sup>xxvii</sup>

During the 1890's, automobiles became a viable mode of transportation. The large carriage makers such as Studebaker of Chicago and Brewster in New York began making auto bodies in addition to carriages. Since at first, the seating remained integral to the interior and the upholstery attachments were made to the carriage/auto frame, pasting, seaming and broad laces continued to be used - both as decoration and as functional coverings for the tacking and assembly techniques.

The introduction of Ford's mass marketed cars produced in a fully integrated automotive manufacturing plant that was a separate entity from the carriage industry allowed for considerable innovation in the upholstery and trims based on cost, durability and the growing market. Coach lace continued to be used in more expensive cars.

Commercial airplanes became a mode of transportation at the end of WWI. The two factors that contributed to the design of interiors was the long configuration of the interior similar to a passenger train car and weight restrictions. Until the motor design innovations of the 1930's resulted in increased weight capacity, the seating was limited to lightweight wicker or rattan chairs.

The final death knell for coach lace occurred on two fronts. The first was the development of independent upholstered panel systems for doors, which eliminated attachments to the vehicle body that was made necessary when car bodies were fabricated from metal. Coach lace continued to be used below the window panels in the front and back seats and for cushion sides. These areas required broad lace. The use of pasting and seam lace was greatly reduced and generally limited to welting.

The second factor that contributed to the demise of coach lace was the influence of Art Deco - sleek, clean and modern. Even the remaining line of trim below the window in the inside door panels were eliminated as lines became more rounded and interiors became streamlined and uncluttered.

## Conclusions

Coach lace was in continual production in this country since at least the 1740's through the 1930's. The weaving of this trim was done by individual weavers, the family way, and after 1837, the factory system. Four time periods characterize coach lace production

The patents indicate that the primary mechanical problem with power coach lace was the wire insertion for the pile. Jacquard mechanisms provided the pattern selection.

Coach lace continued to be used in vehicles that held smaller numbers of people. Trains in the United States adopted a long open car with individual seating that required comfort, economy and durability. Automobiles carried on the carriage configuration as well as continuing to be made by carriage makers. When upholstery techniques in automobiles evolved due to the use of metal bodies and mass production requirements, the functional aspect of trims became obsolete. With the clean lines in the late 20's, even the decorative quality of coach lace went out of style.

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<sup>i</sup> Pred, Allan R. *Urban Growth and City Systems in the United States, 1840-1860*. Cambridge: Harvard University Press, 1980.

<sup>ii</sup> U.S. Department of Commerce. *Historical Statistics of the United States: Colonial Times to 1970*, Prepared in conjunction with the Bureau of the Census. Part 2. Washington, D.C., 1975.

<sup>iii</sup> This term was found in the following sources:

Coxe, Tench. *A Brief Examination of Lord Sheffield's Observations on the Commerce of the United States*. Philadelphia: M. Carey, 1791, p. 118-123. Coxe also uses "household way" and "domestic way".

*Marsh Papers*. 64.52, 64.52B, E, I, and J. Quincy Historical Society. Quincy, Massachusetts.

Scranton, Philip. *Proprietary Capitalism: The Textile Manufacture at Philadelphia, 1800-1885*. Cambridge: Cambridge University Press, 1983. On pages 115-118, Scranton cites Henry Korn's description of his business through 1820.

United States Treasury Department. *Report of the Secretary of the Treasury on American Manufacturers*. Brooklyn: Thomas Kirk, April 17, 1810.

<sup>iv</sup> Good descriptions of coach interiors can be found in the following:

Farr, William A. and George A. Thrupp. *Coach Trimming*. London: Chapman and Hall, Ltd., 1888.

Felton, Wm. *A Treatise on Carriages*. London: by the author, 1796.

Ferrell, Merri. "Carriage Trimming: Overview of Materials and Methods" *The Driving Digest Magazine*, no. 62, 1990/6, p. 36-9.

Philipson, John. *The Art and Craft of Coachbuilding*. London: Bell and Sons, 1897.

Ware, I.D. *The Coach-maker's Illustrated Hand-book, containing complete instructions in all the different branches of Carriage Building*. Philadelphia: I.D. Ware, 1872.

<sup>v</sup> A 1925 Alcoa Pierce-Arrow automobile in the collection of the Henry Ford Museum in Greenfield, Michigan, has a foliated scroll design printed at the top of the door panel under the front windows. The design is a classic coach lace pattern, but the textile elements have been eliminated, with only the decorative image remaining.



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- <sup>vi</sup> U.S. Patent Office. *Subject Matter Index of Patents for Inventions Issued by the United States Patent Office from 1790 to 1873*. 3 vols. Washinton: Government Printing Office, 1874, p.337.
- <sup>vii</sup> Ibid. p. 876.
- <sup>viii</sup> Ibid. p. 880.
- <sup>ix</sup> See:  
Gottesman, Rita S. *The Arts and Crafts in New York 1726-1776: Advertisements and News Items from NY City Newspapers*. New York: Da Capo Press, 1970 reprint.  
---. *The Arts and Crafts in New York 1777-1799*. New York: NY Historical Society, 1954.  
---. *The Arts and Crafts in New York 1800-1804*. New York: NY Historical Society, 1965.  
Green, Susan. Unpublished manuscript. Quincy, Mass.: Quincy Historical Society, July 1988.  
Little, Francis. *Early American Textiles*. New York and London: The Century Co., 1931.
- <sup>x</sup> Ryder, Thomas. "Coach Lace: It's History, Methods of Manufacture and Use". *The Carriage Journal*. vol. 22, no. 4, Spring 1985.
- <sup>xi</sup> Dockham's *American Report and Directory of the Textile Mamufacture and Dry Goods Trade Embracing the Cotton, Woolen, Silk, Jute and Linen Manufacturer's: United States, Canada, Mexico*. Boston: C.A. Dockham and Co., 1905.
- <sup>xii</sup> *Marsh Papers*. 64.52, 64.52B, E, I, and J. Quincy Historical Society. Quincy, Massachusetts.
- <sup>xiii</sup> *Dockham's American Trade Reports: Textile Manufacture and Dry Goods Trade and Directories*. Boston: C.A. Dockham and Co., 1888.
- <sup>xiv</sup> *Bridgeport City Directory*. Bridgeport: Standard Associates, 1873.
- <sup>xv</sup> *The Blue Book Textile Directory*. New York: Davison Publishing Company, 1901.
- <sup>xvi</sup> Coxe, Tench. *A View of the United States of America in a Series of Papers written at various times between the years 1787 and 1794*. Philadelphia: A. Cornman, Junr., 1794, p.141-2.
- <sup>xvii</sup> *Documents Relative to the Manufactures in the United States*. Louis MacLane, Secretary of the Treasury. Order of the House of Representatives, Executive Document #308, 1<sup>st</sup> Session, 22<sup>nd</sup> Congress. Duff Green printers, 1833. Reprint, Economic Classics, New York: Augustus M. Kelley, 1969.  
*Digest of Accounts of Manufacturing Establishments in the United States and their Manufacturers*. Made under direction o the Secretary of State in pursuance of a Resolution of Congress. Washington: Gales and Seaton, 1823.
- <sup>xviii</sup> *Marsh Papers*. 64.52, 64.52B, E, I, and J. Quincy Historical Society. Quincy, Massachusetts.
- <sup>xix</sup> *Directory of Newark, New Jersey*. Newark: Published for the Compiler at the Office of the Newark Daily Advertiser, 1835.
- <sup>xx</sup> Bigelow, Erastus B. *Correspondence Relating to the Invention of the Jacquard Brussels Carpet Loom*. Boston: Alfred Mudge and Son, 1868.
- <sup>xxi</sup> *One Hundred Years 1816-1916*. Philadelphia: J.B. Lippincott Co., 1916.
- <sup>xxii</sup> Baltimore city directories, 1853-68.

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<sup>xxiii</sup> *Dockham's American Trade Reports: Textile Manufacture and Dry Goods Trade and Directories.* Boston: C.A. Dockham and Co., 1888.

<sup>xxiv</sup> These companies were followed in both *Dockham's* (through 1922 when they ceased listing themselves) and *The Blue Book (Davison's)* from years 1900 until 1954 for Vogt Manufacturing Company, when they went out of business. *The History of the City of Rochester*, 1884 was also a source of information on these Rochester businesses.

<sup>xxv</sup> The current address is 1555 Jefferson Rd., P.O. Box 23197, Rochester, New York, 14692. Merle C. Ferris, the manager of PACAL and Textile Lab was quite helpful in several written communications as he remembered some of the weaving equipment. At this writing no samples of coach lace are known to exist.

<sup>xxvi</sup> Harrison, Constance Cary. *Woman's Handiwork in Modern Homes.* New York: Charles H. Scribner's Sons, 1881, p. 172.

<sup>xxvii</sup> White, John H. *The American Railroad Passenger Car.* Baltimore and London: Johns Hopkins Studies in the History of Technology, 1978.