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“Improving” the Decoration of Furniture: Imitation and Mechanization in the Marquetry Process in Britain and America, 1850–1900

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“Improving” the Decoration of Furniture

Imitation and Mechanization in the Marquetry Process in Britain and America, 1850–1900

CLIVE EDWARDS

Introduction

This article takes its cue from research into the applications of machinery to furniture manufacturing that attempted to improve what were essentially handcrafted processes. In particular, I investigate the efforts made to use mechanized or machine methods for the production of a decorative woodworking technique, namely marquetry, in Britain and America.¹ The term “improve” occurs in the title of many patents that attempt to mechanize the processes of marquetry, usually as a technological fix that promised to provide manufacturers with a speedier and more reliable process and the consumer with an aesthetically valuable but inexpensive substitute for laboriously hand-crafted luxury items.

The social construction of technology suggests that various solutions arise to a given problem over a period, thus offering a range of choices.² The application of technology to marquetry is an example of this. These choices offer the various agents a chance to decide to adopt, revise, or ignore the possibilities that the solutions offer, as their needs require. This

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1. Marquetry is the process of covering a surface of a board or piece of furniture with various selected veneers to create a design or picture in the manner of an applied jigsaw puzzle. It differs from inlay, where decorative timbers are let into spaces cut into solid surfaces.

2. Trevor Pinch and Wiebe Bijker, “The Social Construction of Facts and Artefacts”; Wiebe Bijker, Thomas Hughes, and Trevor Pinch, eds., *The Social Construction of Technological Systems*.

methodology suggests that a number of factors are involved in adopting new technologies to which all parties must agree. Successful innovative processes therefore need a producer willing to apply them to the manufacturing process, support from critics and sellers, and an interest from consumers who purchase the products. They do not particularly emerge in response to any apparent demands of the market. Robin Williams and David Edge argued that the social shaping of technology (SST) “investigates the ways in which social, institutional, economic and cultural factors have shaped: i) the direction as well as the rate of innovation, ii) the form of technology; the content of technological artifacts and practices, [and] iii) the outcomes of technological change for different groups in society.”³ I examine these aspects further below.

This examination is of equal interest to historians of technology and design historians, as many of the issues are related to both fields. The connections between the histories of design and technology go back many years.⁴ Design historians may ask *why* an object looks as it does, while historians of technology have frequently asked *how* it looks as it does, with both relating to the study of artifacts within cultures, and the processes of making them. As Michael Ettema noted: “If historians continue to seek some understanding of culture in the design of objects of daily life, they must calculate the techno-economic variables into their analyses.”⁵ In this sense, it is useful to think about the processes that connect design, manufacturing, distribution, and consumption within a common framework. This offers insight into issues of design standardization and nonconformity, attitudes to and the adoption or rejection of innovations, the nature of material choices, and the consumers’ approach to technologies.

Underlying considerations of how the transition from a craft into an industry occurred is the concept that changes in technology are ineffectual unless they are part of a set of cultural values. The idea of the “enduring nature” of some aspects of society that affect its relations with technology provides an attractive reason for technological change based on need rather than notional progress. The furniture industry during the period 1850 to 1900 is an especially good example of this.⁶ The enduring nature of existing technologies, a continuation of the old ways, was frequently ingrained in furnituremakers. Specific methods that had emerged as the dominant and preferred processes tended to perpetuate themselves and hinder any radical innovations, because they worked satisfactorily. There are clearly exceptions, but these mainly occurred when there was an economic imperative or an external driver.

3. Robin Williams and David Edge, “The Social Shaping of Technology,” 868.

4. Barry Katz, “Technology and Design.”

5. Michael J. Ettema, “Technological Innovation and Design Economics in Furniture Manufacture,” 223.

6. See Polly Anne Earl, “Craftsmen and Machines.”

Apart from this perpetuation of traditional methods, there were other considerations that slowed the impact of mechanization in the furniture trade. These factors relate to the reluctance to reinvest in or improve existing facilities. The fragmentary nature of the furniture trade, which was based on the activities of many small traders, inhibited attempts to amalgamate, diversify, and grow. For design historians this is interesting: when an item was made by a craftsman, the design repertoire was limited only by his own capabilities; when factories produced batches of furniture using jigs, moulds, and so on, the designs were limited to the predetermined components available, and variety was only achieved by mixing parts and adding various accessories, although the ever-growing business of expanding the supply of pre-prepared parts helped to maintain a certain amount of variety.

The other matter that arises in the particular context of marquetry and its commercial use concerns the attempts to apply technology (often patented) to what was, in essence, a craft-based system. Were the processes mainly personally devised, mechanistic procedures that might offer a solution to a particular problem in a particular setting, or were they part of an infrastructure that developed using scientific theories, principles, and measurements that practitioners could replicate in woodworking practice? This case study of the later-nineteenth-century furniture industry and inventors' attempts at improving the marquetry process shows a very mixed response, in that some methods were quite successful, while others were commercially or otherwise unrealistic.

Mechanization and Differentiation in Furnituremaking

During the nineteenth century the demand for furniture grew quite rapidly, fueled partly by the population expansion and the desire for increased quantity and quality in the products used to furnish the home;⁷ this, in turn, created an interest in acquiring products that offered some individual differentiation or distinction.⁸ Both of these factors encouraged thinking by manufacturers (and inventors) about how to meet these demands and create particular characteristics, often supplied through the nature of the decoration applied. For example, firms like O. A. Nathusius and Company of New York produced illustrated price lists of a wide range of patented artificial wood ornaments designed for simple “mix and match” application to furniture.⁹

7. See, for example, Sharon Darling, *Chicago Furniture*; and Ben Forster and Kris Inwood, “The Diversity of Industrial Experience.”

8. As long ago as 1977 Raphael Samuel, in “Workshop of the World,” commented on the issue of design differentiation in Britain that encouraged the batch production of consumer goods.

9. O. A. Nathusius and Company, *Illustrated Price List of Patented Artificial Wood Ornaments*.

Although there were attempts at improving production and output through mechanization, factory layout, and division of labor in some woodworking trades, changes in the furniture industry were slow to arrive. In Britain as late as 1919 one report could still argue that “the economic unity in furniture manufacturing still remains the small master.”¹⁰ Even though there were clear commercial advantages in using machines, it was still not until the 1920s that managers and engineers seriously considered the issues.¹¹ An engineer from Grand Rapids, Michigan, wrote in the 1920s that the “[I]ack of engineering ability in the furniture manufacturing organization shows its effect throughout the entire plant: in fact the writer is convinced that the average manager of a furniture plant is more interested in marketing his product than manufacturing it.”¹² There was probably some truth in this, because the furniture trade was renowned for prioritizing marketing over manufacture due both to the nature of the design turnaround of the business and a blasé attitude toward machinery use.

Large-scale production requires a developing and continual market with an inelastic demand for the same item. In woodworking, the manufacture of gunstocks and sewing-machine cases exemplified the standardization process; produced in large numbers using repetitive designs, these methods, which were based on a simple shape formula, were the antithesis of the domestic furniture business.¹³ In contrast, discrimination in design was the underpinning of much of the furniture business, which relied on a wide selection and great variety of choice in design, finish, and fabrics.¹⁴ This rendered mass production an inappropriate form of organization.¹⁵ As Regina Blaszczyk notes, it was “by no accident [that] clusters of batch producers dominate the industrial landscape at the moment when consumerism came to revolve around women and domesticity. These specialized manufacturers, much more than big businesses, ushered the transmogrification of a fragmented group of provision seekers into a nation of highly differentiated consumers.”¹⁶

This highlights one of the problems in developing innovations for the furniture industry, particularly in aspects relating to decoration. The nature of the market and its selling processes did not allow for large runs of the same products. Machinery clearly assisted in the early stages of the process of short production runs, based on introductions for each new season, but

10. *Profiteering Acts 1919–20*, 9.

11. See Jeremy Kinney, “We Hold the Merchandising Idea as Paramount”; and U.S. Bureau of Labor, Commissioner of Labor, *Annual Report of the Commissioner of Labor*.

12. B. A. Parks, “Engineering in Furniture Factories,” 85.

13. David Hounshell, *From the American System to Mass Production, 1880–1932*, esp. chap. 3.

14. See Philip Scranton’s *Endless Novelty*, 184, for details on the John Widdicombe Company’s production during a six-month period in 1899.

15. Carroll Pursell, “Variations on Mass Production.”

16. Regina Blaszczyk, *Imagining Consumers*, 13.

reliance on mechanization fell away toward the final decorative stages.¹⁷ The form of flexible, or specialty, production that allowed for “batch customization” in terms of small additions or variations to standardized product ranges that met customers’ demands for something slightly different was the most successful approach.¹⁸ Therefore the nature of the furniture industry partly meant that, in Alfred Chandler’s words, “total output was increased more by adding men and machines than by continuing technological and organizational innovation.”¹⁹

For example, in a report on a U.S. furniture factory from October 1880 *Scientific American* noted that “it is found more economical in practice to do a large proportion of the carving by hand, rather than fit up the knives and patterns for the machine for all the new and elaborate designs in carving which are always being introduced.”²⁰ Hand-based marquetry techniques, which applied decorative patterns made up of wood veneers to furniture, were in the same position, where the technological developments were generally unable to usurp traditional practices. Despite this, several entrepreneurs and inventors were interested in developing methods of mechanical decoration or reproduction of expensive hand-processes to try to reduce the traditionally expensive costs of handwork.²¹

Although there were various technical developments that improved the supply of decorative components for furniture, including a range of ready-made ornaments and the development of semi-automatic turning, molding, and embossing machines, high-end decorative processes appeared to resist technological development.²² Christian Carron points out that while the high-style-quality Grand Rapids manufacturers were using machined joinery components for carcasses and frames from the 1870s onward, they also added “exceptional carving and marquetry that could not be produced by machinery.”²³ Nevertheless, the development of mechanically produced decoration that was both cost effective and aesthetically pleasing appeared to be the holy grail of producers who needed to change their ranges annually, if not more frequently.²⁴

Manufacturers looked for new ways to develop stylistic novelty; con-

17. See Ettema, “Technological Innovation and Design Economics in Furniture Manufacture,” 206, which suggests that in the case of the United States “the degree to which machinery was capable of reducing labor costs in furniture manufacture was inversely proportional to the total cost of the product.”

18. Scranton, “Manufacturing Diversity” and *Endless Novelty*.

19. Alfred Chandler, *The Visible Hand*, 248.

20. “American Industries—No. 57,” 229.

21. U.S. Bureau of Labor, Commissioner of Labor, *Annual Report of the Commissioner of Labor*, esp. 48–49.

22. The same could be said for other high-end furniture centers in the United States and Europe. For further details on this subject, see, for example, Scranton, *Endless Novelty*.

23. Christian Carron, *Grand Rapids Furniture*, 39.

24. For these aspects of the furniture trade, see *ibid.*, and Darling, *Chicago Furniture*.

sumers wanted the quantity of work evident in their purchases of decorative furniture at competitive prices, and critics demanded the development of an aesthetic sensibility in furniture design without recourse to crass imitation of work by hand. A number of inventors who devised a variety of methods for mechanically decorating furniture attempted to respond to these demands, either through mechanical replication of the hand-process or imitations that created the desired effect. The reasons for this were ostensibly to deliver speed and convenience in the production, the effect of attractive workmanship, and an aesthetic finish in the result, all of which reflect the concerns of the three major social groups involved: manufacturers, consumers, and critics.

The Traditional Marquetry Method

The marquetry method involves combining a variety of cut and shaped wood-veneer sections (or other materials) of differing colors and sizes to build up a pattern or image in the manner of a jigsaw puzzle. This is then applied to a substrate and fitted to the object to be decorated. It differs from inlay, which is the process of inserting segments of wood or other materials directly into a cut, shaped space in a solid substrate (fig. 1).

The process of traditional marquetry was laborious, using individually saw-cut pieces of decorative veneer to create the design. The pattern was pricked through a paper onto the veneers to make the required number of copies. The maker then assembled a sandwich of the selected veneers with a waste piece on either side to prevent splintering. This sandwich was then placed into a vice or marquetry horse and cut out according to the marked pattern. Once the veneers were cut into the required patterns and colorings, they were fitted to one another and, if necessary, into a ground veneer. The worker then finished the panel by papering, gluing, and allowing it to dry. When ready, the marquetry panels were held in position on the furniture carcass with hot cauls or sandbags until the glue set²⁵ (fig. 2).

It is clear that this technique would be a challenge to mechanize, not only for its intricate manipulation processes, but also because there was an element of artistry in the better work. The need for aesthetic judgment in the selection of appropriate veneers, the practice of shading and coloring them,

25. With the development of the French “horse” and English “donkey” during the second half of the eighteenth century, further improvements in marquetry preparation occurred. The improved device clamped the package of veneers in such a way that it allowed for an increased capacity so that the operator could saw twelve veneers at a time; more crucially, however, its built-in horizontal fretsaw frame relieved the worker of the need to hold the saw in one hand. These traditional processes (“Ebenisterie”; “Marqueterie”; “Menuiserie”; “Teinture sur le bois”) are covered in Denis Diderot et al., eds., *Encyclopédie*.



FIG. 1 Marquetry sample. (Source: <http://www.stuartking.co.uk/index.php/articles/marquetry/>. Courtesy of Stuart King.)

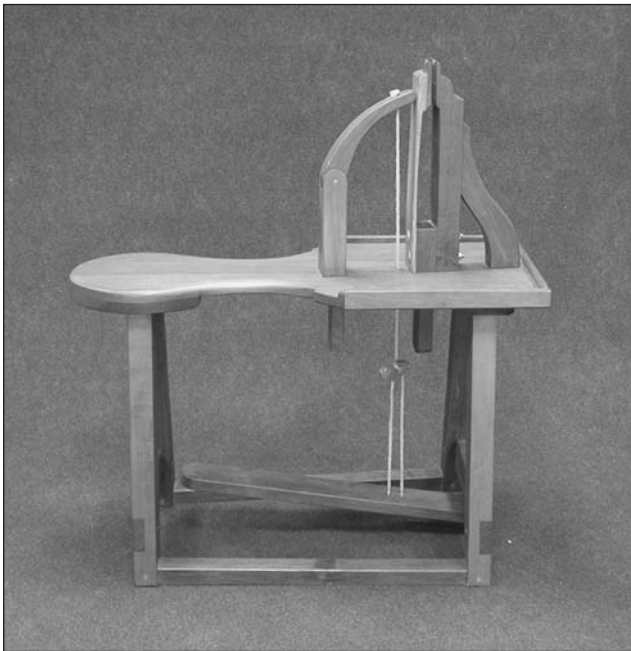


FIG. 2 Marquetry donkey. (Source: <http://www.yannickchastang.com/tools/>. Courtesy of Yannick Chastang.)

and then assembling the jigsaw of pieces meant that inventors would have to rethink the process entirely if mechanical processes were to be successful.

Although popular in the eighteenth century for high-style furniture, marquetry became a victim of the fashion cycle, as tastes waxed and waned for this form of decoration. In 1803 furniture designer and author Thomas Sheraton noted that marquetry “was much in use between twenty and thirty years back; but was soon laid aside, as a very expensive mode of ornamenting furniture, as well as being subject to a speedy decay.”²⁶ Despite these apparent problems, by the mid-nineteenth century British social researcher Henry Mayhew commented that “the beautiful art of marquetry [*sic*] which had fallen somewhat into disuse in this country experienced a revival some ten or twelve years ago.” This resurgence of interest was partly due to the cycle of taste that began to react to the existing rather plain and muscular Gothic Revival styles, with a desire for more decorative finishes. This produced its own problems in terms of meeting the demand. Mayhew noted in 1850 that German and French marquetry workers fleeing the revolutions in mainland Europe came to England. This caused a surfeit of labor so that prices of work were forced down, sometimes to a quarter of their previous rates, thus causing financial hardship in the trade.²⁷

Nevertheless, the exacting skills associated with marquetry work meant that the processes had become a particular specialization within cabinet-making, itself having four distinctive divisions: namely, designers; cutters; colorers; and putters-together, or assemblers.²⁸ This encouraged a simple form of batch production based on this division of labor; indeed, specialist marquetry workshops met much of the demand. For example, around the end of the nineteenth century the English firm of Richard Graefe based in High Wycombe, Buckinghamshire, employed around twenty-four men purely as marquetry cutters, while women assembled the veneers into a variety of pictorial panels for sale to cabinetmaking businesses.²⁹ Even with this division of labor, the process of building up decorative patterns of veneers for any designs beyond simple bands and circular center motifs was still relatively slow and painstaking (fig. 3).

Despite this apparently satisfactory arrangement, from the 1850s onward in England and the late 1860s in the United States, inventors attempted to produce machine-made or machine-assisted marquetry or imitations in an effort to improve the supply. The direction of these innovations and the actual form of technology employed (the content of technological artifacts and practices) moved toward three types of processing: one category attempted to imitate the surface effects of marquetry through print or embossing; another adapted the preparatory processes of traditional mosaic

26. Thomas Sheraton, *The Cabinet Dictionary*, 357.

27. Henry Mayhew, *Morning Chronicle*, 8 August 1850, letter 64.

28. *Ibid.*

29. See Stuart King, “Stuart King.”



FIG. 3 Marquetry sample. (Source: <http://www.stuartking.co.uk/index.php/articles/marquetry/>. Courtesy of Stuart King.)

marquetry; and a third group tried to devise mechanized processes to replicate real “marquetry.”

The role of patents in these attempts to improve the production of marquetry is revealing, because, to be successful, patents must have an economic value, be core to the market needs, and have no viable alternatives. Most of these features were at least debatable in the case of machine-made marquetry, unlike, for example, machine carving. In fact, many of the patents were based simply on variations on one or two themes, such as imitating the effect by print or by pressing colored woods into a surface. In addition, for critics one of the main concerns with any mechanically produced decoration was a concern about the nature of the simulation. The issue of imitation clearly affected manufacturers, retailers, and consumers.

Technology and the Issue of Imitation

Against the backdrop of claims about economy and production were issues concerning the aesthetics and moral appropriateness of imitation in any product.³⁰ The establishment of a British Government Select Committee in 1836 to investigate the relationship between the arts and their con-

30. This was not always the case; see Maxine Berg, “From Imitation to Invention.”

nection with manufacturing reflected these concerns. One witness declared: "I believe that the attempt to supersede the work of the mind and the hand by mechanical process for the sake of economy will always have the effect of degrading and ultimately ruining art."³¹ The arguments rumbled on throughout the century, with the furniture-trade press often pointing out the benefits that accrued from the sensible use of machines in producing decoration. In 1873 the British journal *Furniture Gazette*, while discussing carving, made the realistic point that man and machine were perhaps the best combination: "The simplest [carvings] are at present made by ingenious mechanical processes, for it is now well recognized in industry that certain things are best done by machinery, whilst others are better executed by the hand of man."³² In the following month they also made the point that aesthetics were the basis of any judgment: "the question really is not whether a process is mechanical but whether the result is mechanical."³³

Despite the fact that design reformers and critics were concerned about the idea of imitative and economical decoration, there were many imitative processes developed during the nineteenth century in decorative arts, including, for example, pressed metal, concrete blocks, and linoleum.³⁴ The prospect of a flood of machine-made decoration caused concern among some critics. In 1873 Christopher Dresser elucidated the fears of some critics regarding the excesses that some might perpetrate in the name of ornament. In a presentation at the Society of Arts, he expressed his opinion of a particular mechanical process of decoration. Dresser thought that because ornament was a good thing, some considered that they could not have too much of it, and its excess was only checked by its cost; remove that restraint, he said, and too much elaboration was bound to follow with a consequent loss of effect.³⁵ A little later, in 1885 critic Lewis Foreman Day wrote that "[t]he deepest wrong that machinery has done to Art, is that it has made ornament, or what is meant for ornament, so easy to get that uncultivated persons will not be restrained from using it; and the great majority, even of the so-called cultivated classes, happen to be quite uncultivated in Art."³⁶

Of course, this criticism of the use of unrestrained ornament has been leveled at nineteenth-century products ever since. For example, writing in 1960 architectural critic and historian Ada Louise Huxtable wrote of con-

31. C. R. Cockerell, *Report from the Select Committee on Arts and Their Connexion with Manufactures*, 101.

32. *Furniture Gazette*, 8 November 1873, 491. For more on mechanical carving, see Clive Edwards, "The Mechanization of Carving."

33. *Furniture Gazette*, 27 December 1873, 528.

34. See, for example, Pamela H. Simpson, *Cheap, Quick, and Easy*.

35. *Furniture Gazette*, 27 December 1873, 628.

36. Lewis Foreman Day, "Machine Made Art," 108.

crete: “Its story is a characteristic mixture of the immediate imaginative American recognition of unprecedented technological possibilities and the willingness to do what had never been done before with the tastelessness of a new middle class society that accepted substitute gimcrackery for traditional materials and ideas.”³⁷ Although this was harsh, the use of imitations and substitutes was partly a reflection of the desire to display objects that were apparently full of “work.” Miles Orvell points out that “at every level of [nineteenth-century] society individuals sought an elevation of status through the purchase and display of goods whose appearance counted for more than their substance.”³⁸ The examples of pressed glass that imitated high-style cut glass, machine-carved furniture that replicated hand-carving, and plated metal that reflected solid silver demonstrate these desires in the same way, as does imitation marquetry that replicated superior handcrafted work.³⁹ Whether design pundits liked it or not, methods of mechanical decoration were a manifestation of attempts to meet the demand by using new or revived techniques, often in imitation of the originals.

Imitation Inlay and Marquetry

One of the first and apparently most successful inventive minds that devised a method of imitating marquetry was an Englishman named John Dyer, who in 1861 patented a process that produced an imitation of marquetry on the surface of deal or pine furniture.⁴⁰ His simple method consisted of coating a cheap wood surface with gum, size, or wax and then applying blocks, stencils, or transfers to the surface and applying appropriate colorings to create the design. The dry surface was then French-polished. Dyer, along with partner Watts, developed this into a commercial business (fig. 4).

Designer Lorenzo Booth, in his 1864 publication *Original Design Book for Decorative Furniture*, praised the partnership for their “honest intentions,” writing that “[t]hese gentlemen have directed their attention, first to treating a common material with first rate workmanship and superior design; and secondly they have involved and introduced a decorative system, which is simple, effective and expressly suited to their common material.”⁴¹ Critical acclaim continued. *Art Journal* was even more glowing in its account of the firm’s products: “Messrs Dyer and Watts claims from us a most decided expression of our approval and admiration—not only because of its intrinsic elegance, but also because, being so excellent, it is in every re-

37. Ada Louise Huxtable, “Concrete Technology in the U.S.A.,” 144.

38. Miles Orvell, *The Real Thing*, 49.

39. See, for example, Blaszczyk, *Imagining Consumers*.

40. John Dyer, British Patent no. 1,661, issued 29 June 1861.

41. Lorenzo Booth, *The Exhibition Book of Original Designs for Furniture*, 16.

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FIG. 4 Dyer and Watts cabinet. (Source: <http://www.puritanvalues.co.uk/auction6.htm>. Courtesy of Anthony Geering [Puritan Values.com].)

spect adapted to both the requirements and the means of the community at large.”⁴² Four years later *Art Journal* commented on Dyer and Watts’s exhibit at the 1867 Exposition Universelle in Paris: “Neither can we fail to commend the tasteful and comparatively inexpensive bed-room suite in imitation woods made by Dyer and Watts. The effect is absolutely illusive, so closely has the inlay of real woods been copied.”⁴³

Interestingly, not just design critics, but artisans as well praised this deceptive work. In the *Reports of Artisans Selected by a Committee . . . to Visit the Paris Universal Exposition, 1867* on the same exhibition, a reviewer said that “Dyer and Watts exhibit a bedroom suite . . . of pine, stained and grained to imitate satin-wood, inlaid. I should judge this to be the finest specimen of stained wood, as it quite deceives the eye, and is well finished.

42. “Notabilia of the International Exhibition,” 80.

43. *The Illustrated Catalogue of the Universal Exposition 1867*, 210. The reference to inlay actually refers to marquetry.

It has been purchased by the [French] Empress.”⁴⁴ Finally, more than ten years later, in 1879 critic G. W. Yapp, commenting on the painted-furniture process of Dyer and Watts, pointed out that painted ornament made to imitate inlaid work was a waste of its possibilities, saying that “on the contrary, it is capable of effects quite beyond the reach of marquetry.”⁴⁵

There were, inevitably, imitators of this successful process. London furniture manufacturer George Maddox openly declared in his 1865 catalog of bedroom furniture that his suites “were made of polished deal with the additions of ornamental borders, centres etc. of imitative marquetricie [*sic*] having all the appearance of being really inlaid and being equal in every respect to satinwood and marquetricie.”⁴⁶ William Bemrose supported the honest intentions of this imitative technology, writing in the introduction to his 1872 textbook on the craft of marquetry production:

There are some persons who would object to the introduction of a spurious style of marquetry in this volume. Our plea is, that genuine marquetry is necessarily expensive, and therefore beyond the reach of many. Further, why not improve upon the present style of “cheap furniture,” oftener than not painted stone colour, when with but little additional cost an artistic effect is produced, that is undoubtedly far preferable, and is of a character to promote a taste for something better than the present tasteless style of modern “cheap furniture.”

Bemrose goes on to explain that “[m]anufacturers use what is called a stencil plate, which consists of a thin piece of soft metal in which the design is cut out, so that when placed upon the wood, and the stain carefully applied by a short stiff brush, called a stencil brush, only that part where the metal has been removed to form the design receives the stain.” The simple employment of a stencil process seems to have allowed for a certain democratization of the marquetry effect.⁴⁷

Similar imitative marquetry activity was also encouraged in the United States. The example of Charles Spurr and Louis Prang of Boston is instructive. In 1875 they developed a process of printing on prepared plain-white wood veneer. This was a fascinating business linkup, because it joined two disparate trades: Prang was a well-known printer and publisher who introduced Christmas cards to the country, and Spurr was apparently in the veneer business. Although acknowledging that printed marquetry effects already existed, in 1882 they patented a particular preparatory process, which required treating the veneers with a solution of acid and then one of

44. Society for the Encouragement of Arts, Manufactures and Commerce, *Reports of Artisans Selected by a Committee . . . to Visit the Paris Universal Exposition, 1867*.

45. G. W. Yapp, ed., *Art Industry*, quote on Plate 119.

46. George Maddox, *An Illustrated Catalogue of Bedroom Furniture*, 2.

47. William Bemrose, *Manual of Buhl-work and Marquetry*, 29.

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FIG. 5 Louis Prang and Charles Spurr's patent drawing (1875). (Source: www.google.com/patents/US171538.)

glycerin before having the surface painted and backed with paper. The patent specification explained the result: "With the article so produced, an excellent and remarkably close imitation of marquetry or inlaid work, especially of wood, ivory, or bone, may be accomplished at a trifling expense, in comparison to that required to produce the real work, of which the article may be an imitation"⁴⁸ (fig. 5).

It is difficult to gauge its success, but in 1882 Spurr established a business in Sandwich, Massachusetts, named "Spurr's Patent Veneers, Marquetries, and Wood Carvings." This developed into the firm of Charles W. Spurr and Company, where "a large number of men are now engaged in cutting veneers for cigar boxes, car work, furniture, and for ornamental uses, and carvings for furniture and ceilings."⁴⁹ Whereas paper-backed veneers were promoted widely, the patented marquetry process was not mentioned in the advertising.⁵⁰

Seven years after Prang and Spurr's original patent, William Schroeder of San Francisco applied for a patent for another variation on the stenciling process that was quite clear in its mass-market goals, being "intended to be applied to the cheaper kinds of furniture and where it was desired to

48. Charles Spurr and Louis Prang, U.S. Patent no. 171,538, issued 28 December 1875.

49. Simeon L. Deyo, ed., *History of Barnstable County, Massachusetts*, 264–302, quote on 279.

50. *Real Estate Record and Builders' Guide*, 9 (advertisement in front matter).



FIG. 6 William Schroeder's patent drawing (1882). (Source: www.google.com/patents/US257081.)

produce a fine effect of inlaid work at moderate expense.⁵¹ His process was the reverse of Prang and Spurr's patent: Schroeder coated his panels with each color first, then applied a stencil and removed the coloring from the surface to create the pattern. At the end of the nineteenth century George Allen of New York patented yet another similar process⁵² (fig. 6).

51. William Schroeder, U.S. Patent no. 257,081, issued 25 April 1882.

52. George Allen, U.S. Patent no. 606,953, issued 5 July 1898.

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These variants illustrate attempts to either copy more expensive processes cheaply or achieve effects that would otherwise be unobtainable. As in other cases, the results might have been to broaden the repertoire of available processes and encourage a narrowing of differentials between the real and the illusory. The evidence from an analysis of patentees seems to suggest that the more successful patented methods were those granted to individuals who had knowledge of woodworking and indeed ran their own businesses producing marquetry effects. It seems clear that the intention of all these imitations of marquetry techniques was to improve the aesthetics of “cheap furniture” through batch-production methods to meet the demands of a lower middle class, and not to replace the traditional skilled processes used in high-style furniture for the custom-made market. Indeed, well-known U.S. firms like Berkey and Gay, Nelson Matter and Co., and Phoenix Furniture Co., all of Grand Rapids and the high-class London makers like Jackson and Graham and Gillow and Company continued to employ their own workers, using traditional methods of marquetry, to decorate their products and maintain a clear separation from batch-production methods.⁵³

Mosaic Marquetry

The second group of approaches to the issue of “improving” marquetry decoration were those that tried to better the preparatory processes. One of the simplest was mosaic work. The use of marquetry techniques to produce overall repetitive mosaic designs, often for small furniture items, has a long tradition of handicraft and, like pictorial marquetry, attracted a number of attempts to improve it. The basic process used cut lengths of various colored, small-section timbers glued together in long strips. By cutting through at ninety degrees these made multicolored veneer sections, which would appear to be ideal for the decoration of the numerous small boxes and similar items that the Victorian consumer purchased. Indeed, the technique known as Tunbridge ware, widely used for souvenirs, was a good candidate for improvement.⁵⁴ Here, inventive ideas turned toward making the preparatory processes easier and faster.

A French marqueteur named Maurice Marcelin was one of the first to

53. Carron, *Grand Rapids Furniture*, 38–39.

54. Tunbridge ware was a form of decorative woodworking based on building up a block of shaped hardwood rods (usually squares, triangles, and rhombuses) to reflect the desired pattern or mosaic image. These were then glued together to form a solid block. Next, the sliced blocks were assembled in accordance with the pattern, and then glued and pressed together so that they eventually had the whole design running through the full depth of the block. By carefully slicing at ninety degrees to the block, it was cut into mosaic veneers that were then laid onto a whitewood base. The center of this work was Tunbridge Wells in Kent, especially during the eighteenth and nineteenth centuries.

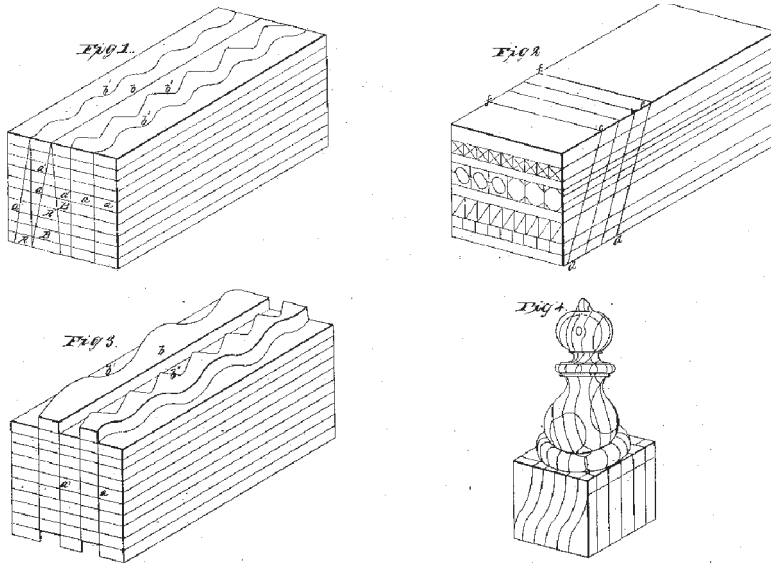


FIG. 7 Linson De Forest's patent drawing (1860). (Source: www.google.com/patents/US26898.)

do so, exhibiting his technique of mosaic veneering at both the 1851 London and 1855 Paris international exhibitions. He invented a decorative process, which is described as being midway between artistic marquetry and Tunbridge ware.⁵⁵ The method involved gluing together strips of colored woods to make a mosaic pattern, and then cutting this block at precise angles; finally, the worker applied the mosaic veneer to a surface as required. In 1860 Linson De Forest, a plane-maker in Derby, Connecticut, patented a similar process in America.⁵⁶ His method was based on a process of creating wood-mosaic work by building up composite blocks of timber sections glued together to avoid warping, which were then cut at angles to reveal a range of different effects. This seems remarkably similar to Marcelin's process (which was not patented) except for the angle of the cut (fig. 7).

In the same year of 1860 Otto Heinicke and Moritz Laemmel of Brooklyn, New York, also patented a mosaic-veneer system.⁵⁷ In this instance it did not use wood parts, but instead a plastic material. The process involved forcing the material through a metal plate with the appropriate design upon it, drawing the resulting rods together, and then gluing and harden-

55. *Official Descriptive and Illustrated Catalogue of the Great Exhibition*, vol. 4, 1208; Matthew D. Wyatt, *On Furniture and Decoration*, 296.

56. Linson De Forest, U.S. Patent no. 26,898, issued 24 January 1860.

57. Otto Heinicke and Moritz Laemmel, U.S. Patent no. 28,481, issued 29 May 1860. Laemmel also patented an imported printing press and a "mechanical movement based on an adjustable shaft and level arrangement to control oscillating movement."

ing them. Finally, the bundles were sliced into veneers ready for application. The patent was reissued in 1867; the American Mosaic Veneering Company of New York appears to have exploited it.⁵⁸ Nearly twenty years later, in 1885 piano-maker Amand Chatain of New York patented yet another mosaic system, his declared objective being to allow “for manufacturing wooden mosaic work cheaply, for increasing its durability, and for enhancing its beauty.”⁵⁹ His design assembled mixed cross- and end-grain cuts of rods made into tiles in the manner already described (fig. 8).

Improvements in the wood-mosaic process were clearly worth considering, as they were both popular and given critical acclaim. In 1878 Harriett Spofford wrote in glowing terms of the American practice of importing East Indian hand-assembled marquetry: “No marquetry exceeds for curiosity, that which is occasionally brought now from India, known as the mosaic of Bombay and made of microscopic cubes of wood that produce a fine effect.”⁶⁰ Around 1890 Tiffany and Company of New York introduced a wood-mosaic process that “was produced by a new method of work. The patterns . . . are made of thousands of squares of natural wood, sixteenth of an inch in size, of different colors, and each individual square surrounded by a minute line of metal.”⁶¹ This definition seems to refer to a form of mosaic veneer with added metal strips in the built-up block. Finally, in 1896 Karl Zuppinger, a Zurich mechanic, received a British patent for a method of manufacturing mosaic plates or designs. The feature that characterized his process was that “from a number of different blocks which are composed of coloured plates are obtained differently composed plates by cutting in the transverse direction, which plates are joined together to form a block according to the design to be produced, this block being cut transversely into plates for the purpose of working, not with single small rods, but with plates, and thereby simplifying the manufacture of mosaic plates”⁶² (fig. 9).

All these processes were, in fact, variations on the theme of the traditional mosaic Tunbridge or Bombay ware. It is difficult to tell whether they made much of an impression upon the furniture-makers of the time, be-

58. U.S. Patent no. RE2,633 (1867) (reissue of U.S. Patent no. 28,481 of 1860). On 21 June 1867 the *London Gazette* noted the following: “To Alfred Vincent Newton, of the Office for Patents, 66, Chancery-lane, in the county of Middlesex, Mechanical Draughtsman, for the invention of ‘an improved method of producing mosaic veneers.’—A communication to him from abroad by the American Mosaic Veneering Company (incorporated), of the city of New York, in the United States of America.”

59. Amand Chatain, U.S. Patent no. 310,381, issued 6 January 1885.

60. Harriett Spofford, *Art Decoration Applied to Furniture*, cited in Metropolitan Museum of Art, *19th-Century America*, n.p.

61. Tiffany and Company catalog, Chicago Colombian Exposition 1893, cited in Metropolitan Museum of Art, *19th-Century America*, n.p.

62. Karl Zuppinger, British Patent no. 189,622,547, issued 12 December 1896.

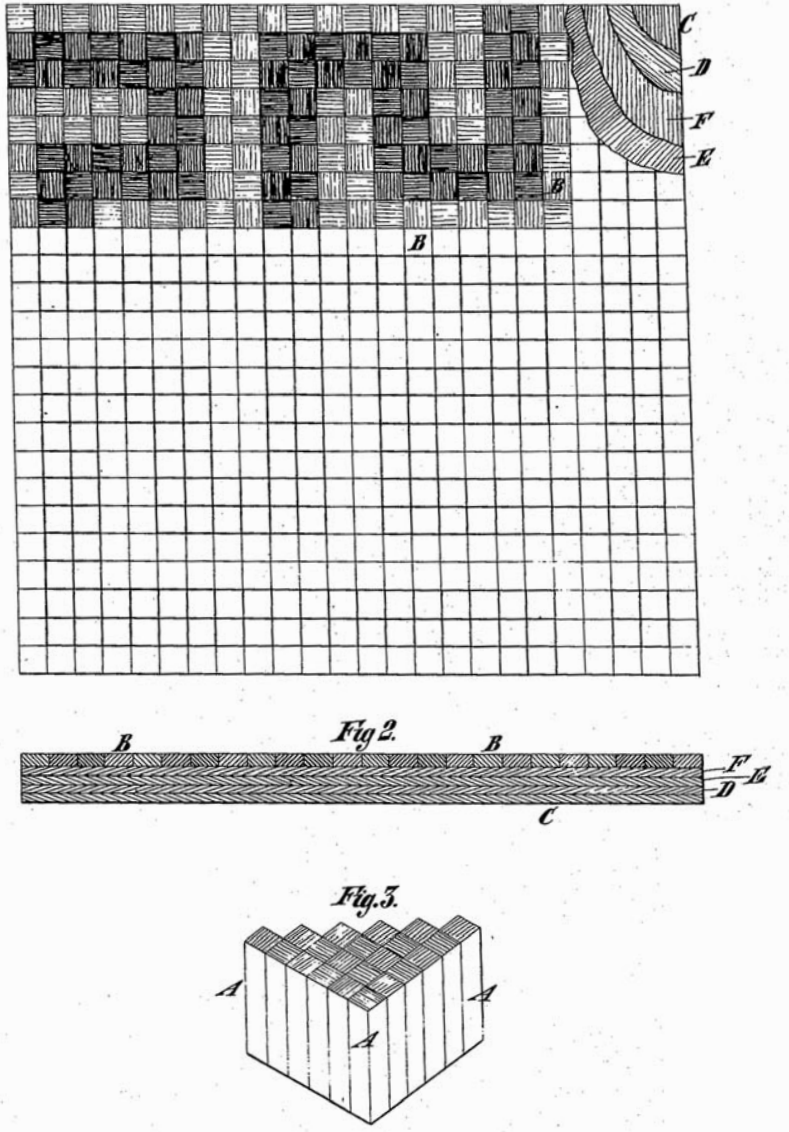


FIG. 8 Amand Chatain's patent drawing (1885). (Source: www.google.com/patents/US310381.)

cause the finished articles (using either the ready-made process or the handcrafted version) were likely to be very similar in outward appearance, which was, after all, their aim.

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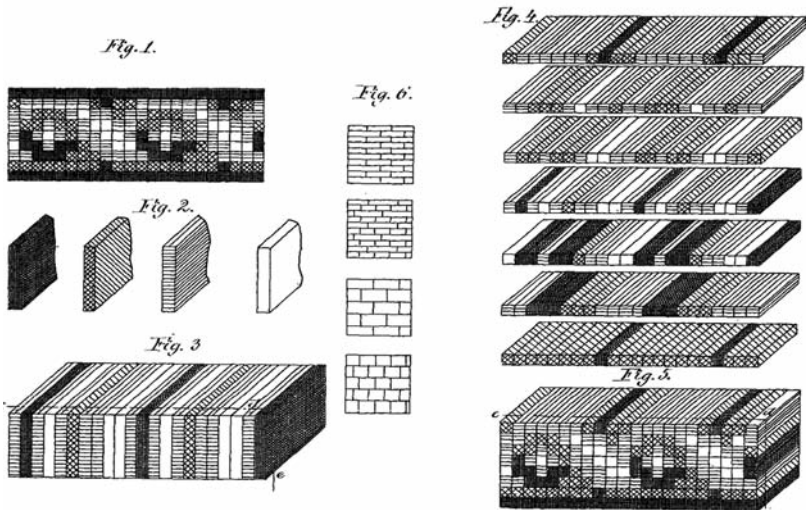


FIG. 9 Karl Zuppinger's patent drawing for mosaic plates (1896). (Source: <http://worldwide.espacenet.com/GB189622547>. Crown copyright, used with permission.)

The Special Case of Boule (Buhl) Marquetry

Boule, or buhl, was a particular marquetry system that traditionally used panels of brass and tortoiseshell, as opposed to wood veneers, to create decorative patterns for applications to a substrate.⁶³ Once mainly reserved for French aristocrats, from early in the nineteenth century onward there was an increasing interest in making these styles available to a wider market through improved techniques. In 1830 *Mechanics Magazine* carried a report on one particular invention for “buhl-cutting.”⁶⁴ This machine, made by a Mr. McDuff, who was a member of the London Mechanics Institution, won a prize of £10 for the best machine invented in 1829. McDuff was a working turner who devised an arrangement that allowed for the mounting of a frame with a reciprocating saw onto an existing wheel-operated lathe, thus having the benefit of freeing both hands and having the work surface flat. This method still used a saw process similar to the original marquetry “donkey” method, but apparently reduced the time and improved the efficiency.

The use of stamping techniques for the metal (usually brass) sections of the work also speeded up the imitation boule process. At least prior to 1818 British cabinetmaker George Bullock (1777–1818) had a stamping press

63. French cabinetmaker André-Charles Boule (1642–1732) was one of the most well-known craftsman of marquetry to use brass and tortoiseshell. He gave his name to this style of work now known as boule, or buhl, work.

64. “McDuff’s Buhl-Cutting Machine,” 130.

with an iron vice and dies, which can reasonably be assumed to have been used to cut out the brass-strip decoration that he is known to have used as inlay.⁶⁵ Interest in mechanically assisted boule work continued into the middle of the century. In 1839 Andrew Ure, in his *Dictionary of Arts, Manufactures and Mines*, described boule decoration, in which he mentions the use of punches to cut out the shapes required, and in 1856 Matthew Wyatt noted in *On Furniture and Decoration* that “stamps or punches are sometimes used in buhl work of brass or wood, but only to a limited extent.”⁶⁶

Wyatt criticized the practice of makers using the boule techniques simply to doctor old furniture rather than to design new models. He said that “[i]t is a great pity that much of the ingenuity and dexterity which are now brought to bear in doing-up old foreign work should not be devoted to the improvement of our contemporary productions.”⁶⁷ However, throughout the century cabinetmakers continued to use some mechanical processes in boule work. In 1863 the *London Cabinet Makers’ Book of Prices (Supplementary)* noted that “Buhl borders stamped into veneer tops are charged at half the price of banding.”⁶⁸ This seems to imply a punching process straight into the wood-veneer surface to create a boule-like border effect at a reduced cost, which is interesting because this work was aimed at middle- to upper-grade journeymen and employers.

Other methods of obtaining boule effects without great cost included substitutions of materials. In a guide published in 1830 the process of using a blend of tin and quicksilver mixed with size was suggested as an alternative to the more costly silver inlay.⁶⁹ A different process devised by a Mr. Cremer involved a method of applying a blend of japan and copper to a base frame to create an effect that resembled boule for between a tenth and a twentieth of the cost. This method involved engraving a copper plate, then taking an impression of this in gutta-percha onto which was deposited a film of copper. The operative painted the entire surface with strong japan color that was built up and stoved between each layer. When it was as thick as the excised parts, the operative rubbed it down to the copper surface, thus leaving the japan color in the excised parts of the pattern.⁷⁰ Naturally, this process required a substantial investment in time and process, so there had to be a substantial demand for it to become economically viable.

Evidence of such a demand occurred in 1890 when the British magazine *Furniture and Decoration* noted that “the modern manufacturers saw out simultaneously ten or twenty sheets [of brass and tortoiseshell] and the

65. Clive Wainwright, *George Bullock*.

66. Andrew Ure, *Dictionary of Arts, Manufactures and Mines*; Wyatt, *On Furniture and Decoration*, 296.

67. Wyatt, *On Furniture and Decoration*, 294.

68. *London Cabinet Makers’ Book of Prices*.

69. George A. Siddons, *Cabinet Makers’ Guide*, 120.

70. Wyatt, *On Furniture and Decoration*, 294.

whole result is so rough and paltry that to call it Boulle is a calumny on the name.⁷¹ This would appear to be a triumph of economy over craftsmanship. In any event, each of the preceding efforts attempted to simply speed up the process and did little to improve the actual practice of laying the veneer decoration; in fact, it was clear that the genuine bouble process would remain an exclusive decorative effect.

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Mechanized Replication of Marquetry Methods

The third generic process that attempted the mechanization of the actual fitting or laying of veneer decoration was of a different order to the imitative processes. Many critics considered marquetry, apart from its simple geometric or repetitive designs, to be an artistic endeavor. The process of the careful selection and choice of wood veneers, coloring, shading them appropriately, and then fitting them together in an artistically skillful manner was not the stuff of engineers. However, in 1877 Chicago-based inventor Ernest Jebsen patented a machine for marquetry work that purported to go some way in this direction: “My invention relates to a machine by which veneers of different colors or shades are punched and the blanks thus obtained are transplanted [*sic*] from one veneer to another, all of which is performed at [*sic*] one operation. . . . My machine will be useful for making marquetry, buhl-work, or tarsia for ornamentations with choice woods, metal, ivory, leather, mother-of-pearl, &c.”⁷² This idea addressed the problem of creating a good fit between the various elements of the design by avoiding gaps that might need to be filled. On the face of it, this seems like a solution to the main issue of rapid setting out, but there is little evidence of its use⁷³ (fig. 10).

Some of the mechanized processes were bizarre and although the effects created were interesting, they were a long way from traditional marquetry or inlay. Clara Matéaux described a “cheaper kind of patent veneering” as follows:

Here the thin slices of wood are glued fast to board, and on it is placed a piece of zinc in which has been punched a scroll or other design. This metal plate is somewhat thicker than the sheet of wood. The whole board is then submitted to a roller, which forces the metal into the surface of the veneer, which is then planed until the zinc itself is reached. This is of course, forming a pattern, which has been fairly squeezed into the surface of the solid wood.⁷⁴

71. *Furniture and Decoration*, 1 October 1890, 280.

72. Ernest Jebsen, U.S. Patent no. 196,906, issued 6 November 1877. It is possible that this is the Jebsen who was a partner in the Chicago architectural firm of Jebsen and Frommann.

73. *The Directory of American Tool and Machinery Patents* has no record of its use.

74. Clara Matéaux, *The Wonderland of Work*, 153. This would appear to be very sim-

No. 196,906.

Patented Nov. 6, 1877.

Fig. 1.

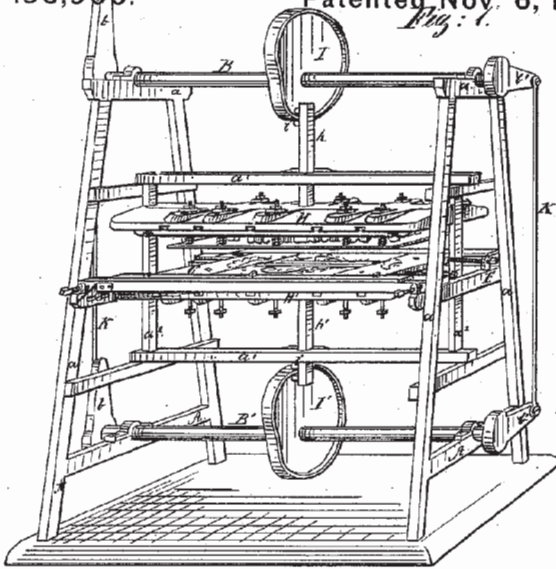


Fig. 2.

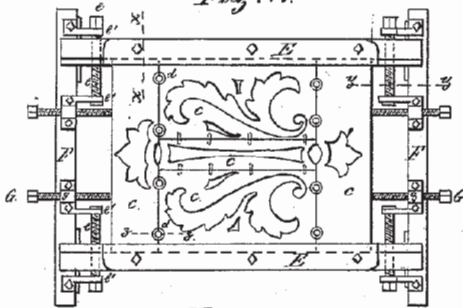


Fig. 3.

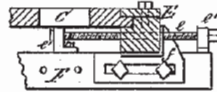


Fig. 4.

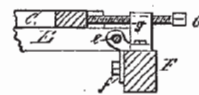


Fig. 5.



Fig. 6.



Witnesses
S. A. Decker
G. K. Decker

H₂

Ernst Jepsen
Geo. W. Dyer & Co.

Inventor

Attorneys

FIG. 10 Ernest Jepsen's patent drawing (1877). (Source: www.google.com/patents/US196906.)

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Although this description was apparently based on a visit to a large factory, there is little evidence in other inventories or descriptions that these processes were widely adopted. This was probably due to the nature of the furniture industry, whereby a wide range of products and styles produced in limited quantities inhibited the introduction of long-run processes. Additionally, the general availability of ready-made marquetry panels made with traditional skills that were commercially viable met the demand. Nonetheless, inventors continued to attempt to address the issue.

In 1871 a Birmingham cabinetmaker named John Tysall patented a mechanized method of inlaying by cutting inlay into a carcass then veneering over the top, and finally carving out the pattern again to reveal the inlay beneath.⁷⁵ This seems like a perverse method. Five years later a Philadelphia inventor, William Brock, used tongued and grooved panels linked together and cut through to produce striped marquetry panels for floor and decorative uses⁷⁶ (fig. 11).

The fascination with the potential of mechanically pressing patterns onto a surface also continued. For example, in 1877 two London cabinetmakers, John Thornton and James Thallon, patented yet another process for “inlaid marquetry.” This rather oxymoronic term used a method of relief-cut rollers that impressed the pattern onto the surface. Subsequent planing of the surface revealed the marquetry-like design. The specification explained that “[t]his invention relates to a novel process of inlaying woods with coloured woods and equivalent ornamental substances for the production of parquetry and marquetry work, whereby a great economy will be obtained, the work of mechanical pressure being substituted for operative skill.”⁷⁷

Some commentators considered “mechanical pressure” to be no substitute for “operative skill.” For example, the Royal Society of Arts, in a commentary on the exhibits shown at the 1878 Paris Exposition Universelle, noted that a wardrobe by British makers Howard and Sons had “some machine-made marquetrie [*sic*], which is simply an abomination.” It goes on to describe the creation of this “abomination”: “It is made by cutting the pattern with a stamp, placing it on the veneer that is to form the ground, and squeezing the one into the other by machine pressure. . . . Anyone may imagine the ragged edges left by such a process. In fact, the wood must become pulp before it can do what is intended.” The document ended with the declaration that “so long as wood is wood, and until a machine can be

ilar to the description of the patent process devised by a Mr. Howard of London, described in G. P. Bevan, ed., *British Manufacturing Industries*.

75. John Tysall, British Patent no. 308, issued 4 February 1871.

76. William Brock, U.S. Patent no. 178,989, issued 20 June 1876.

77. John Thornton and James Thallon, British Patent no. 3,632, issued 19 October 1875; U.S. Patent no. 186,180, issued 9 January 1877.

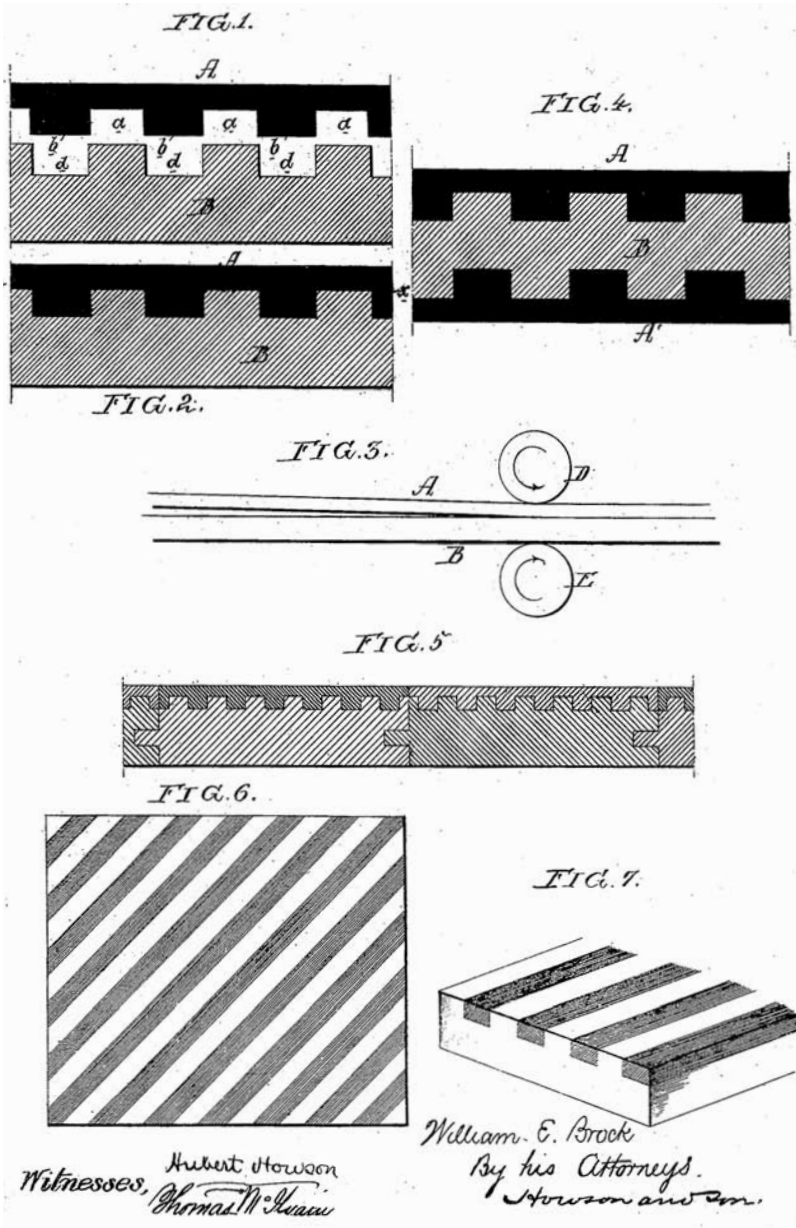


FIG. 11 William Brock's patent drawing (1876). (Source: www.google.com/patents/US178989.)

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invented to deal with it as wood, marquetric [sic] will have to be made by hand.”⁷⁸ Although it contains some degree of bias, considering that artisans from within the trade wrote it, its declaration of the problem of working with an inconsistent natural material is undoubtedly true.

Despite the many detractors, however, interest remained high in the potential of patented mechanical methods of marquetry and the problem continued to be explored. In 1879 Eugene Masselin of New York devised a method of marquetry in relief, which was a carved marquetry process similar to the work of celebrated French cabinetmaker Henri-Auguste Fourdinois (1830–1907).⁷⁹ The illustrated cross section in figure 12 indicates how the marquetry was positioned in relation to the surface, thus allowing some carved effects to finish it (fig. 12).

The *Pall Mall Gazette* recorded some interest in the aesthetics of marquetry in a report of June 1886. Discussing an exhibition of marquetry furniture at the high-end London firm of Collinson and Lock, it noted that

[t]he revival of artistic furniture . . . cannot but be of interest to the average intelligent citizen but when it is intimately connected with the re-establishment of a great art industry hitherto practically dead in England, and with the development of an extremely remunerative employment for ‘women who work,’ it appeals to the commercial as well as the callaesthetic [sic] instincts of the community. . . . The inlay of furniture with ivory and other forms of marquetry through the medium of simplified machinery can now be entrusted to female hands.⁸⁰

The employment of females was certainly not a question of cheap labor in this case, because these workers were paid fifty shillings a week by Collinson and Lock.⁸¹

A number of new developments in marquetry occurred in Germany at the end of the century. In 1898 Alfred Dunskey, a Berlin architect, devised a means of using a transparent or translucent filling, such as celluloid, and ornamental backing to create inlay or tarsia work⁸² (fig. 13). Two years later,

78. Royal Society of Arts, *Artisan Reports on the Paris Universal Exhibition of 1878*, 419. London cabinetmakers Howard and Sons employed an individual named James Thallon, so it may have been his invention they used.

79. Eugene Masselin, U.S. Patent no. 217,129, issued 1 July 1879. Fourdinois laid sections of wood into the substrate to the depth of three-eighths of an inch, and in some cases through the entire thickness. This inlay was left slightly above the surface and subsequently carved with detail. This technique, which prevented movement of the inlays, was known as *marqueterie en pleine*.

80. “Occasional Notes,” 3.

81. *Ibid.*; see also “Relative Value of Sums of Money” for comparative wage rates, showing that an agricultural laborer earned fourteen shillings a week and a building craftsman thirty-three shillings a week.

82. Alfred Dunskey, British Patent no. 189,822,867, issued 31 October 1898.

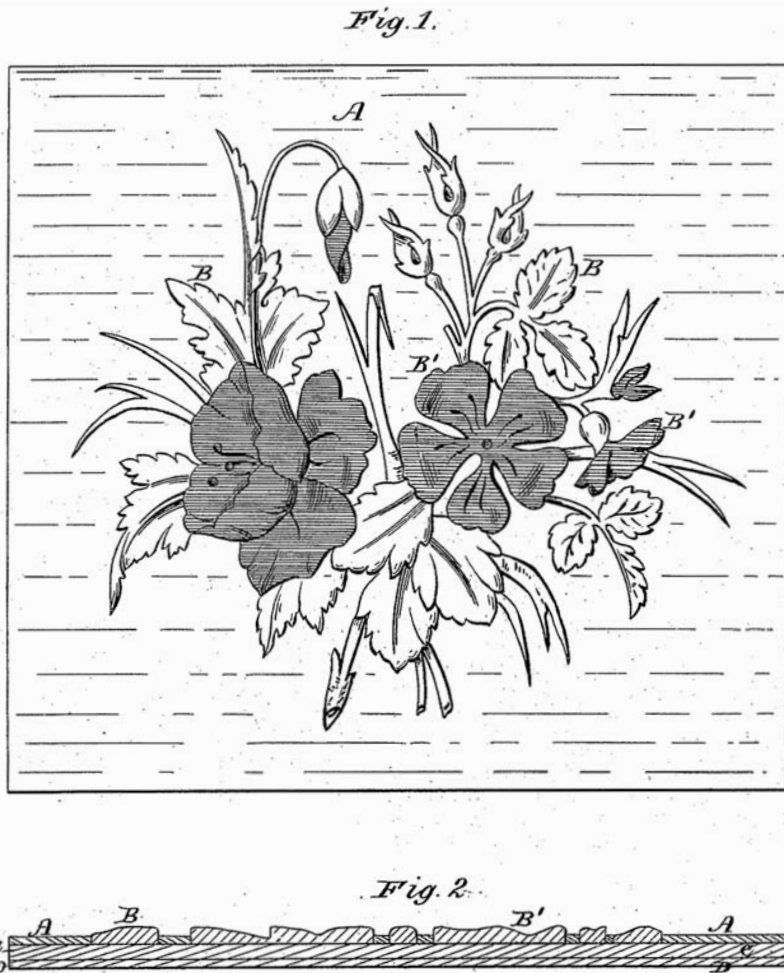


FIG. 12 Eugene Masselin's patent drawing (1879). (Source: www.google.com/patents/US217129.)

in 1901 Ernst Hugendubel, an umbrella manufacturer in Stuttgart, patented a method of implementing marquetry effects on top of soft base materials, such as pasteboard and papier mâché, so that various thicknesses of veneer might be used. The application of heavy weights pressed the veneer pieces into a “soft” base, thus creating a flat surface.⁸³ The apparent impracticality of this process, which experienced cabinetmakers would surely have rejected, might be explained by the inventor's occupation.

A year later (1902) Auguste Boehme, an inventor from Bohemia, conceived a system whereby the marquetry pattern was stamped out of a steel

83. Ernst Hugendubel, British Patent no. 190,121,859, issued 30 November 1901.

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Fig. 1.

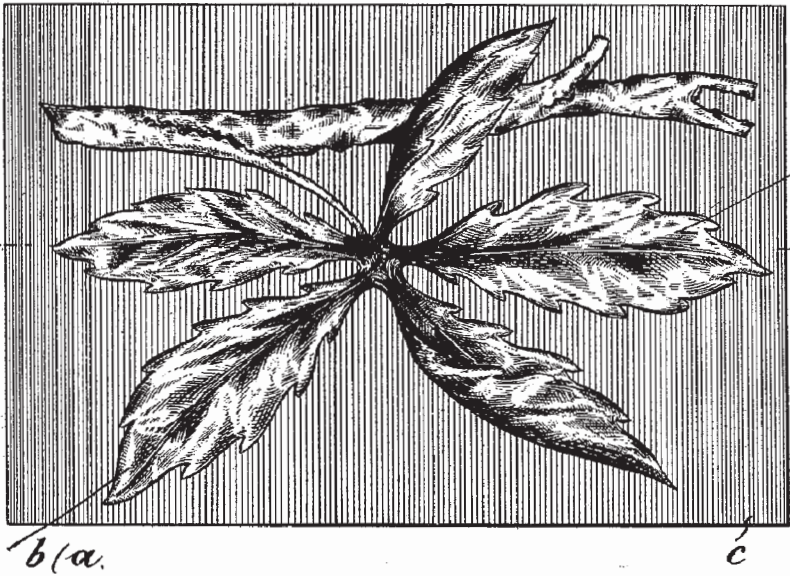


Fig. 2

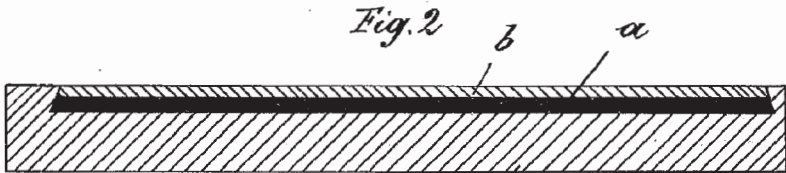


FIG. 13 Alfred Dunskey's patent drawing (1898). (Source: [http://worldwide.espacenet.com/GB189822867\(A\)](http://worldwide.espacenet.com/GB189822867(A))). Crown copyright, used with permission.)

plate. Cutting blades were used in the openings of the design. The plate was placed on the bed of a pressing machine with the sheet of wood in which the pattern was to be punched out. Pressure was applied and the pieces were accordingly stamped out of the sheet of wood, to be fitted into perforated sheets of a different kind of wood.⁸⁴ There is no evidence of this method being adopted.

Conclusion

The majority of developments in mechanized marquetry occurred between the years 1840 to 1890, but there were continuing developments

84. Auguste Boehme, British Patent no. 190,113,274, issued 15 May 1902.

and attempts made during the twentieth century, which were mainly variations on the previous efforts.⁸⁵ Changes in fashionable styles and the developing taste for less decorated furniture affected demand, but specialist firms continued to supply small-scale, ready-made marquetry panels to the trade for use in chair backs and cabinets, for example.

The irony is that the most recent patented development relates to the very basic though crucial cutting of the veneer patterns, rather than to the overall assembly. Like many other patents, this latest one responds to a primary need—the accurate cutting of basic materials. Most previous attempts had concerned themselves only with stamping out or printing, with the result that the demanding sawing-out process had been neglected. Developments in laser technology applied to cutting materials have been occurring since the 1960s, often related to the precision cutting of sheet metal and the like. However, it was not until 1986 that an important development occurred, when Atz-Maria Denger received a German patent for the laser cutting of veneers in marquetry work. The benefits of such cutting are explained in the patent:

The method for producing marquetry from a plurality of pieces of veneer wood makes provision for the respective pieces of veneer to be divided up into the necessary sections by means of a cutting laser. In this manner, very accurate cut joints limited by clean-cut edges are obtained, requiring no form of after-treatment. The cut joints are so narrow that the regions of the veneer sheet on both sides of the cut joint can be used as parts for the marquetry. Laborious manual work to cut the parts to size for marquetry is eliminated; moreover, the time required is greatly reduced.⁸⁶

Commercial marquetry workers have enthusiastically taken up the laser-cutting process for its precision and lack of harm to the veneers, but like other fundamental processes related to furniture-making, this development has not so much fully mechanized the process as it has created greater accuracy and taken only some of the drudgery out of an essentially artistic endeavor (fig. 14). Indeed, many craft-based workers still prefer the older cutting techniques, as these are viewed as more “authentic.” Concurrently, although not as a direct result of these developments, furniture with decorative patterns and designs became fashionable again from the 1980s onward, thus in general benefiting marquetry.

The reasons for the comparative lack of success in the mechanization of the processes of marquetry are reflected in the social shaping of technology. The outcomes of these attempts at technological change for different groups in society were limited. First, there was a continuity of older meth-

85. A search of European patents issued between 1900–2010 shows seventy-two patents mentioning the term “marquetry.”

86. Atz-Maria Denger, West German Patent no. DE3,432,681, issued 13 March 1986.

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FIG. 14 Example of modern marquetry: Arizona Birds (2008). (Source: Courtesy of Aryma Contemporary Marquetry Ltd., Llandrindod Wells, Wales, UK.)

ods that worked successfully in relation to the demands of the marketplace. Second, because marquetry could be both relatively simple and repetitive or highly individualistic and exclusive, existing processes catered to both markets. And finally, the industry satisfied consumers' tastes for decorated furniture either through other means or by the use of simple, ready-made, or batch-produced marquetry panels. Indeed, all successful imitations were relatively simple processes devised by furniture-makers who may not have even bothered to patent their process. As I. B. Holley has clearly pointed out in his work regarding a different industry, it was "in the exploitation of natural materials, the 'practical men' who acquire their knowledge from hands-on experience have often resisted the infusion of scientists [or inventors] into their ranks."⁸⁷ Apart from the application of imitative processes and the introduction of the laser as a cutting method, marquetry still remains a practical handicraft skill.

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87. See I. B. Holley Jr., "The Mechanization of Brickmaking," 101, where he discusses brickmaking and mechanization.

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