

## Tackets, Buckles, and Overbands: Italian Stationery Bindings of the HBS Medici Family Collection

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Figs. 1a–i. See end of essay for descriptions.

### INTRODUCTION

In the fall of 2013, Baker Library at the Harvard Business School (HBS) began a multi-year project to make the archive of the HBS Medici Family Collection accessible and known to Renaissance scholars.<sup>1</sup> The goal was to create a research portal that would provide full access to these unique volumes and related research materials. In preparation for the digitization of all the account books, Laura Linard, senior director of Special Collections, initiated a conservation project, including stabilization and repair of the account books from the Medici Family.<sup>2</sup> This unique collection contains 150 examples of stationery bindings belonging to one family, from one geographical area over a 200 year period, possibly made by the same stationer company. Initially, the account books all appeared similar. As the project progressed, subtle differences in the features and structures were noticed, and these observations were collected through a survey of binding features. Through carefully examining the numerous examples of this collection, the conservation team developed a more complete understanding of the differences and similarities among these books. By describing the binding features observed in this collection, the author sheds light on trends in fifteenth- and sixteenth-century Italian stationery binding traditions. Figs. 1a–i.

### COLLECTION HISTORY

The Medici family occupied a central role in banking and politics of Florence, Italy, throughout the Renaissance. In addition, they also operated businesses in the important wool trade of Florence. Through their banking and business trade, they practiced double-entry bookkeeping techniques and the general ledger accounting system.<sup>3</sup>

1. From its inception in 1927, Baker Library at Harvard Business School has collected rare and unique materials that focus on the evolution of economic life, business, and industry. Spanning eight centuries, the collections include manuscripts, rare books, pamphlets, broadsides, photographs, prints, advertising ephemera, and corporate reports. These rich and varied collections support research in a remarkably diverse range of fields. Baker Library holds the largest collection of Italian Renaissance account books outside of Italy: <<https://www.library.hbs.edu/hc/medici/>>; accessed 7 January 2019.

2. HBS Medici Family Collection. Baker Library Special Collections, Harvard Business School.

3. See: <[https://en.wikipedia.org/wiki/House\\_of\\_Medici](https://en.wikipedia.org/wiki/House_of_Medici)>; accessed 7 January 2019.

In 1918, Christie's in London planned to auction a large collection of Medici records offered by descendants of the family, Marquis Cosimo and the Marquis Averardo de' Medici.<sup>4</sup> For reasons of state, the Italian government halted the auction, preempting manuscripts primarily related to art acquisitions. However, the sale of general business records proceeded the following year, and Harry Gordon Selfridge, an American-born London-based businessman with an interest in the history of business, bought most of this collection.<sup>5</sup> In 1927, Selfridge deposited most of the collection at Baker Library of the newly established Harvard Business School and the remaining twenty-seven volumes were added in the 1950s.

At Baker Library, the Medici Family Business Records comprise fifteen linear feet of 150 account and letter books, as well as numerous unbound manuscripts. Covering a 200 year period from 1376 through 1597, this collection contains record books for local banks, cloth-dyeing companies, wool-manufacturing companies, government offices, and private-estate management. These books document the business and personal activities of six generations of one branch of Florence's Medici family.<sup>6</sup> These private account books and journals survive from a time period corresponding to Florence's greatness as a center for both Renaissance culture and early capitalism. While valued as incredible resources for the study of early modern business and economic practices, the materials provide new perspectives on international trade, on merchant activities along the main Silk Road to China, intercultural and interreligious trade among Christians, Jews, and Muslims, and much more. Relative to the silk trade, the Medici records provide insight into the pivotal Florentine cloth business that was central to Florence's prosperity and its emergence as a major city in Italy.<sup>7</sup>

#### STATIONERY BINDINGS

Stationery binding is an umbrella term that refers to handbound blank books produced for personal, business, or other record-keeping purposes.<sup>8</sup> There are many different types of stationery bindings, each categorized by their intended use, e.g., archival bindings, ledger books, and blank-book bindings. It is thought that the stationers, who produced these bindings, were a group of craftspeople distinct from bookbinders who bound printed texts.<sup>9</sup>

4. Richards, Gertrude R.B. *Florentine Merchants in the Age of the Medici; Letters and Documents from the Selfridge Collection of Medici Manuscripts*. Cambridge: Harvard University Press, 1932.

5. The portion of the collection not purchased by Selfridge now resides at the British Library and at the University of Manchester: <<https://bit.ly/2FY6gUZ>>; accessed 1 July 2019.

6. The books in the HBS Medici Family Collection are from a collateral branch of the Medici family, not the branch that is famous for banking and being the rulers of Florence. The most important figure in the collection is Francesco, who was the cousin and contemporary of Lorenze il magnifico.

7. Laura Linard correspondence with the author, July 2019.

8. Language of Bindings Thesaurus: <<https://www.ligatus.org.uk/lob/concept/3045>>; accessed 30 December 2019.

9. Roberts, Matt T. and Don Etherington. *Bookbinding and the Conservation of Books: A Dictionary*

Stationery bindings are made to withstand heavy daily use and are intended to be written in, and thus must open fully for ease of writing while the book lies flat on a table.

The HBS Medici Family Collection contains many different types of stationery bindings: memoranda, notebooks, day books, and ledgers. Merchants used these books to record the day's business dealings, keep track of subcontractor workflows, and total debits and credits. It is likely that all of these record-keeping books were kept in a central shop, or "bottega," and would have been used by the Medici's accountants. Initially, a smaller blank book, called the notebook or *quadernaccio* – would be written in a quick, somewhat messy manner. Here information would be gathered on the spot for every transaction or order, such as the contents of a shipment, how it was packaged, its condition upon receipt, any tariffs imposed, etc. The daily business dealings were then transferred into the day book or *giornale* in a streamlined diary-like entry. Day books were larger than the notebooks, but still modest in size.<sup>10</sup>

Later, the pertinent information for profits and losses were transferred into the ledger or *libro*, also referred to at the time as the debits/credits or *debitori/creditori*. A separate set of these ledgers were used for each production subset of the wool industry: the spinners or *filatori*, the weavers or *tesitori*, and the dyers and workers or *tintori e lavoranti*. These master ledgers or *libro maestro*, larger and often more ornate, contained all information concerning incoming profits or distribution of money to the different freelance workers, utilizing the double-entry bookkeeping technique.<sup>11</sup>

Florentine bankers were early in implementing the use of double-entry bookkeeping techniques, now a common business practice. In the ledger, the entries were organized alphabetically by account and were often accompanied by an index. A standard ledger entry consists of two columns listing the debits and credits of an account. Fig. 2. A ledger's continuous use might extend over several years or even decades. For each partnership of a business, the first ledger would be inscribed with the letter "A," and any subsequent ledgers for that business were marked "B," "C," and so on.<sup>12</sup>

The front covers were also inscribed with a brief descriptive title, such as "giornale" or "debitori/creditori." Most volumes had an inverted teardrop-shaped symbol, either on the

*of Descriptive Terminology*: <<http://cool.conservation-us.org/don/dt/dt3321.html>>; accessed 7 January 2019.

10. In this collection, the stationery bindings tended to fall into four rough dimensional categories (H × W, in centimeters): 23 × 16.5, 29 × 23, 34 × 27, and 43 × 30. Each of the different types of account books were found in most of these size categories. One could conclude that the dimensions were somewhat standardized and likely based on paper sizes, and the user chose whichever dimension met their needs. While I make a generalization that ledgers were larger, many smaller sized ledgers were found in this collection.

11. Pacioli, Luca. *An Original Translation of the Treatise on Double-Entry Book-Keeping*. Venice, 1494. Tr. Pietro Crivelli. London: Institute of Book-Keepers, 1924, 12.

12. These letter designations would be inscribed on the front cover of the binding in iron-gall ink or painted on the head or tail of the book block.

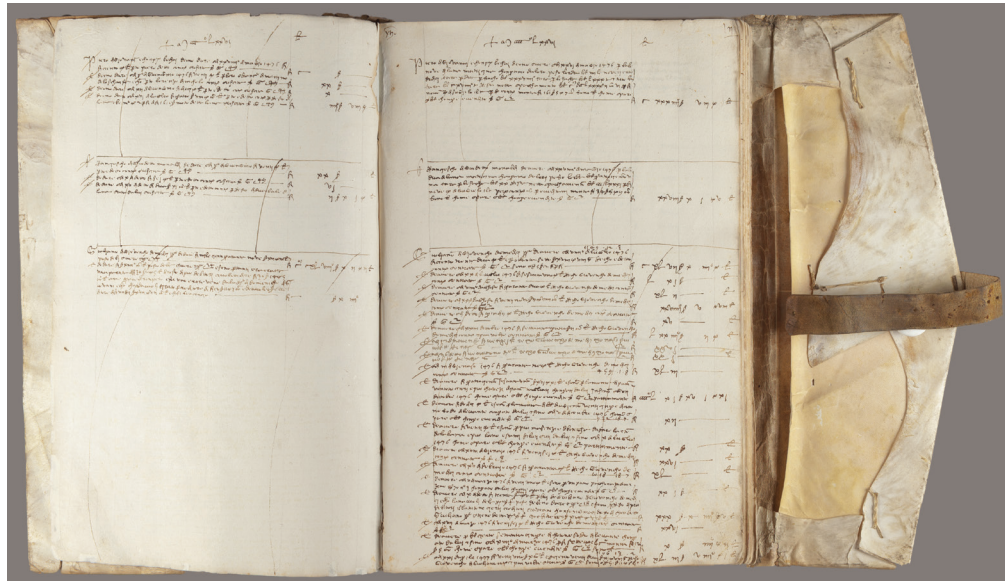


Fig. 2. A typical account entry: the two columns to the right tally the debits and credits in the double-entry bookkeeping tradition. A slash is written through an entry when the account is settled or has been copied to the master ledger. Medici v. 509, 1476–1486.



Fig. 3. This account book was the first for this business, and therefore was inscribed with an “A.” Each member of the Medici family had a unique symbol, a variation of this upside-down teardrop; this one belongs to Raffaello di Francesco. Medici v. 551–4, 1513–1519.

cover or in the text, indicating its owner.<sup>13</sup> Fig. 3. On the first page, a small caption would also be written about the owner, the binding, and the contents of the text.<sup>14, 15</sup>

#### BINDING STRUCTURE OVERVIEW

Italian stationery bindings have a unique structure and features not found in other types of bookbindings. To understand how they were made, one must look at each element of construction.

Typically, the book block is constructed from thick paper gatherings sewn with a coarse thread over split leather thongs.<sup>16</sup> The spine is normally flat with no adhesive or linings, but often becomes concave through use. The limp parchment cover, made from a single skin folded in at the head and tail, wraps around the book block, and a pentagon-shaped fore-edge flap extends from the back cover and fastens to the front cover with a metal buckle and leather strap, alum-tawed ties, or loop and toggle closures. The overbands – straps of thick leather or alum-tawed straps – are attached across the front cover, spine, and back cover with lacings of alum-tawed skin. The lacings create decorative patterns as they pass through pierced holes in the overbands and cover, securing them in place.

These bindings are often referred to as “tacketed” bindings. A tacket is a small strip of alum-tawed skin, parchment, or even thread, which creates a loop when tied to itself. Historically, tackets were used to group bifolia in a quire or to directly attach gatherings to a binding. In this collection, the tackets are made from thin alum-tawed strips, and are used to secure the turn-ins of the cover and attach the book block to the cover along the spine and endbands.<sup>17</sup>

Very often flat-spined books become concave through use. This is especially the case with non-adhesive structures due to their inherent flexibility. To counteract this tendency, binders introduced many restraining elements to the stationery binding, such as stiff leather overbands and sewing supports, fore-edge flaps with closure mechanisms, and, later, pulpboard stiffeners for the cover and spine, and metal rods added to the sewing supports.<sup>18</sup>

13. Richards, *Florentine Merchants*, 45.

14. One example of an inscription is, “debitori e creditori segnato A coregie rosse leghato in charta pechora,” debtors and creditors, marked A, red straps, bound in sheepskin parchment. Medici 567(8). Information transcribed by Robert Fredona, Marie Curie Fellow, York Management School, correspondence with the author, 9 November 2017.

15. A few entries have been found referencing the amount paid to the stationers or *cartolai* for the purchase of specific account books in this collection. “The wool-manufacturing firm of Francesco de’ Medici paid Giovanbattista Fontani and Co., stationers, 48 lire di piccioli [a money of account; at the time the exchange was 7 lire di piccioli = 1 florin, so nearly 7 florins] for all the books made for and received by the firm in 1556.” Information transcribed by Fredona of the account with the Fontani Co. from Ms. 567(11), ff. 25v–26r.

16. “Bookblock”: <<http://w3id.org/lob/concept/1227>>; accessed 7 January 2019.

17. Other stationery bindings from Italy have been observed with spine and endband tackets made of twisted parchment, while the turn-in tackets and saltire spine tackets remain in alum-tawed strips.

18. Metzger, Consuela. “Colonial Blank Books in the Winterthur Library.” In *Suave Mechanicals: Essays on the History of Bookbinding*. Vol. 1. Ed. Julia Miller, 107. Ann Arbor, Mich.: The Legacy Press, 2013.

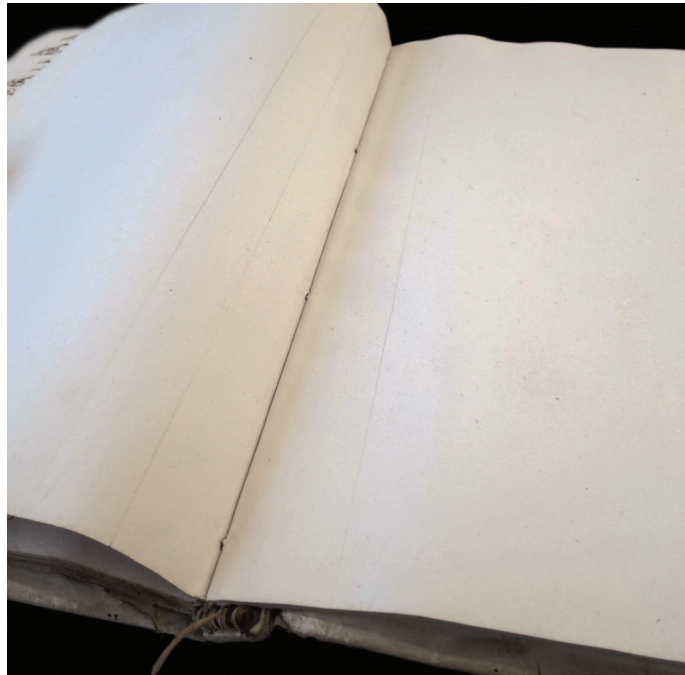


Fig. 4. Ruled lines were likely made in advance by the stationer. These unused pages were found at the back.

#### PAPER AND INK

These ledgers were intended to be permanent records, therefore the stationers selected the best quality paper. These early Italian stationery books used a thick handmade paper sourced from local Italian mills. Italian paper from this period was made from linen rags with water that comes directly from the limestone-rich mountains of Northern Italy. This water was perfect for papermaking because its high calcium levels left an alkaline reserve in the paper. In combination with gelatin surface-sizing, this calcium buffer has kept the paper crisp and white for over 500 years. In this collection, numerous watermarks of Italian origin are found throughout the book blocks, but the cardinal's hat with tassels or a circle enclosing an anchor are the most predominant. The pages of the book were ruled into columns in preparation for accounting entries. Columns were either ruled with a metal stylus or lightly folded. Fig. 4. Impressions from the ruling marks seem to have been imparted on subsequent leaves, indicating that they were done after the bifolia were gathered or the book was sewn. Additionally, most volumes were numbered in the top corner in iron-gall ink. The same number was used on the left and right side of an opening spread, instead of the recto/verso of one leaf. The numbers are all of one hand with a similar ink, suggesting both were done at the same time during the preparatory stage. Since all the leaves were prepared for use even when only a fraction of the book was used, it is likely that ruling and numbering were done by the stationer.

Fig. 5. Blotting papers were used to expedite ink-drying. Many blotting papers were found loosely inserted throughout the collection. Medici v. 551–3, 1509–1518.



Iron gall was the ink of choice for official dealings. Because of its bite in the paper, it was thought to be impossible to tamper with and thus permanent. Although these books are heavily inscribed with iron-gall ink, very little iron-corrosion-related damage is found. This is primarily due to the high-alkaline content of the paper and the quality of the inks.<sup>19</sup> To expedite drying the ink, blotting papers were used. Several volumes had blotting papers left in the gutter, which were heavily saturated with ink and often embrittled. Fig. 5.

#### BOOK BLOCK

In these stationery bindings, the book block is constructed from thick gatherings, which are almost always comprised of eight bifolia. It is difficult to determine how the gatherings were trimmed because today the edges of the book block are slightly uneven due to the shifting of the pages along the sewing thread, typical of a non-adhesive structure. Fig. 6a. Because there is no adhesive on the spine, one would assume that the gatherings were cut prior to sewing. Methods of trimming a sewn book block, such as with a draw knife or guillotine, are less effective without adhesive on the spine to keep the pages in place. Another interesting feature is how the fore edges of each of the gatherings jut out gradually towards their center.

19. Reissland, B. "Visible Progress of Paper Degradation Caused by Iron Gall Inks." In *The Iron Gall Ink Meeting*. Ed. A.J.E. Brown, 67–72. Newcastle upon Tyne: University of Northumbria at Newcastle, 2001.

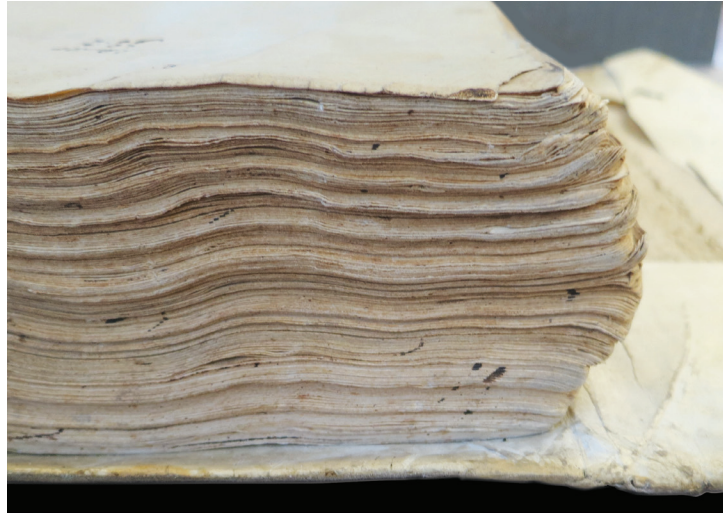


Fig. 6a. The natural shifting of the bifolia in a non-adhesive structure results in this unevenness with use.



Fig. 6b. Edges of the book block show a regular stepping pattern that correlates with the gatherings, where the middle of the section juts out. Medici v. 560–5, 1547–1552.

Fig. 6b. This may suggest that the paper was cut to size prior to folding, or may just be a feature of loosening sewing threads over time.

In this collection, most of the book-block edges were left undecorated. Only the larger more ornate leather ledgers had elaborately painted floral designs on the head and tail edges. Often heavily inscribed books exhibit ink splatters and marks extending off the fore edges, giving the impression of intentional sprinkling. The head or tail edges were often inscribed horizontally with the year the accounts were recorded. The orientation of these inscriptions implies that the books were originally stored horizontally, possibly even stacked. Only later were paper labels affixed to the spine in vertical orientation.

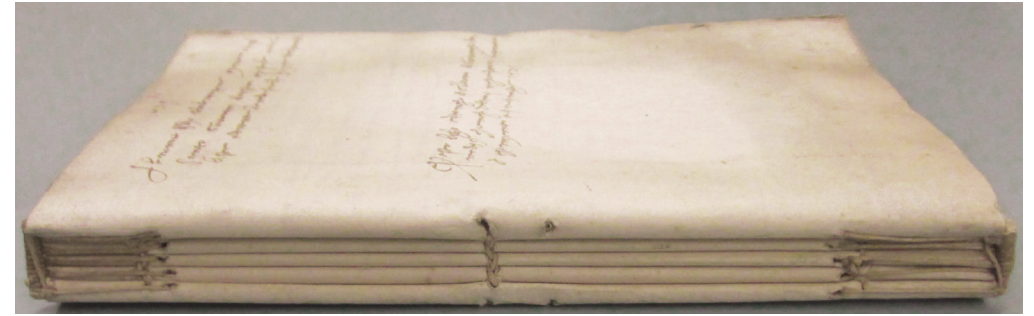


Fig. 7. Smaller volumes were sewn unsupported with a link stitch, often with just three sewing stations. Here the kettle stitches at the head and tail are hidden under the endband tie downs. The extra holes near the center sewing station are from the saltire tacket cover attachment. Medici v. 539, 1509–1521.

#### SEWING

All the volumes were sewn with loosely spun, two-ply S-twist, unbleached vegetable-fiber thread that is relatively soft and easily compactible.<sup>20</sup> The heavyweight of the paper and the large number of bifolia per gathering both absorb the thickness of the thread, and result in a book block with no swell. The spines of the book are intended to be flat, though with use can shift to a slight concave shape.

Small, thin volumes, such as memoranda and day books, were sewn with a link-stitch at three sewing stations with a kettle stitch at head and tail. Fig. 7. The large heavily used ledgers, however, required a more robust sewing structure and were sewn over split thongs of thick tanned leather or alum-tawed skin.<sup>21</sup> Fig. 8. The thongs were generally 1.5 to 2 cm. wide and split from one end, along about two-thirds of their length, though roughly half of the thongs were not split completely, leaving a small area at the tip connected. It is not uncommon for a single book to contain thongs of both tanned leather and alum-tawed skin, and even dyed alum-tawed. Fig. 9. Many of the thongs have blind tooling, evenly spaced perforations, or remnants of stitching, suggesting a recycling of satchels, saddles, or other leather goods.<sup>22</sup> Figs. 10a–b.

Logically, one would assume that the book would be sewn from the unsplit side to the split side. While sewing, if the binder had the split ends pointing up, it would make wrapping around the split thongs easier. A sewing pattern typical of double supports, which creates a

20. Fiber analysis performed by Debora Mayer on a fragment of sewing thread from Medici v. 600–1, using transmitted polarized-light microscopy, found the composition to be bast fiber, likely either hemp or flax. Results with the Red Plate test and the drying twist test indicate a Z-twist fiber, such as hemp.

21. Over 80% of the collection was sewn over split thongs, the remainder were sewn unsupported with a link stitch.

22. Five split-thong sewing supports tested with PMF-MALDI (see fn. 28) all proved to be from a cattle origin. As the only component of the bindings that was cow, this may further suggest the material was sourced from a different craft stream.



Fig. 8. Split-thong sewing supports were a robust method of sewing for heavily used account books. The threads wrapped around the support form a B pattern, but tend to group together in twos, alternating from side to side. Note that these thongs are not entirely split. Medici v. 600-1, 1497-1506.



Fig. 10a. Stitching along one side of the thong suggests it was recycled from a previous leather product.



Fig. 10b. Remnants of tooling on this leather thong.



Fig. 9. This volume was sewn with one blue-dyed alum-tawed thong, head; one tanned-leather thong, center; and one white alum-tawed thong, tail. Medici v. 600-4, 1545-1548.

“B” pattern, is observed. In this pattern, the thread exits the spine through the center of the split and then, traveling in the direction of the sewing, wraps around one side of the thong, passes behind the entire thong, and then reenters through the center of the split. Thus, seen from above, the path of the thread resembles the letter B.<sup>23</sup> A feature of double-support sewing is how the threads, wrapping on each side of the thong, stack on top of each other. Due to the softness of the leather/tawed thongs, thread wrappings tend to group together, alternating from side to side. At first glance, it may appear that the binder wrapped one side of the thong twice and skipped the opposite side, but this is just an effect of the second wrap stacking above the first wrap. An unobstructed view of the sewing can be found at the back where unused gatherings were removed. Clearly visible on the underside of the thong, the thread entered the split, wrapped around one side of the thong once, then traveled behind the thong fully, often at a diagonal angle, then wrapped around the front of the other side of the thong, and finally reentered the book block. Fig. 11.

In several instances, book blocks were proportionally laid out with five sewing stations, but used only four split thongs, with two positioned at the head and two at the tail. The center station was either left empty and unpierced, or replaced with a link stitch; see Fig. 16. Certainly, this sewing abbreviation could solely have been a time-saving method, but it had other practical implications. This structural variation was only observed on volumes with buckle-and-strap closures. If a thong had been laced through the front cover at this location, that extra thickness would make adding the *keep* for the buckle difficult. Keeps and their use

23. Although a link bypass sewing over split thongs was observed in similar tacketed stationery books, no examples of that sewing pattern were observed in this collection. Bearman, Frederick. “The Laced Overband: Its Place in the History of Stationery Bindings.” In *Care and Conservation of Manuscripts 16: Proceedings of the Eleventh International Seminar held at the University of Copenhagen*. Copenhagen: Museum Tusulanum Press, 2018, 198.



Fig. 11. Underside of the sewing support, showing evidence of removed gatherings: severed threads and tacket remnants. In addition to the oversized slots in the parchment endleaf wrapper, note holes that indicate additional gatherings were once added to the book block. Medici v. 556-2, 1521-1523.



Fig. 13. Endband sewn over a rolled alum-tawed core. Medici v. 555-6, 1545-1546.



Fig. 12. Four sewing supports with the center station unused. Note that spine tackets were placed on the center overband but did not loop around a sewing support. Endleaf wrapper made from recycled manuscript waste. Medici v. 561, 1547-1552.

are discussed later. Fig. 12. Note that there were many examples that did not omit the center sewing support.

#### ENDBANDS

All the volumes in this collection have sewn endbands that are more structural than decorative. To form a rigid support, the endbands were sewn over a rolled core of leather or alum-tawed skin. The stiff endband cores were probably intended to help keep the spine flat. Fig. 13. The endbands needed to be strong because they were the point of attachment of the cover at the head and tail by way of tackets.

The endbands were fashioned with a heavy, vegetable-fiber thread, identical to the thread used to sew the book block. Without a bead on the front or back, the endbands were sewn by simply wrapping the thread around the core and were always tied down in the center of each gathering. When tying down, the wrapping threads crossed from the front of the core to back, creating a figure eight pattern that helped lock the endband in place. The larger, more elaborate ledgers often have a two-color secondary endband sewing, wrapped with a front bead, over this primary endband sewing, Fig. 14.

Sometimes, the sewn endband was finished with an unusual thread path, which appears to be a tensioning stitch.<sup>24</sup> Fig. 15. On the last wrap, the binder passed the thread behind the

<sup>24</sup> This feature could only be observed on those very few volumes that were separated from the covers.



Fig. 14. Secondary endband sewing with red- and white-silk threads with a front bead. Medici v. 509, 1476–1486.

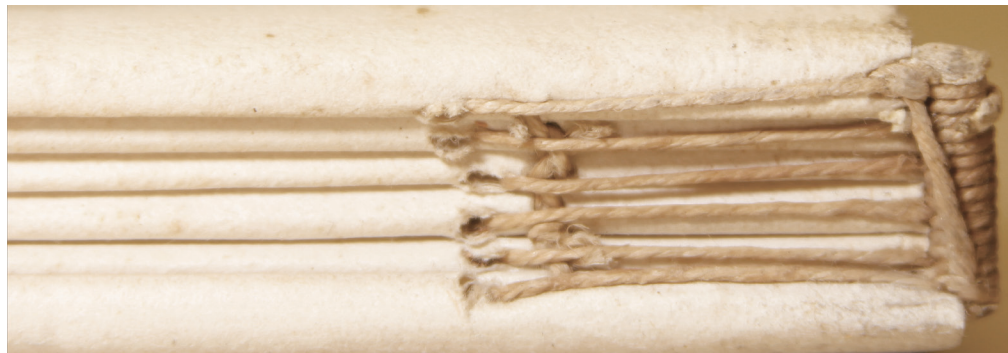


Fig. 15. Endband was finished with a tensioning stitch that helps to hold the endband wrappings onto the core. Medici v. 539, 1509–1521.

last tie down, then along the spine behind the core, then again behind the first tie down, before finally being tied into the first gathering and knotted on the spine. This appears to have helped hold the endband wrappings onto the core by cinching in the tie-down threads. Once the sewn endband was finished, the core was cut flush to the shoulder. If not for this tensioning stitch, the wrappings would have easily slid off the core.

#### ENDLEAVES

The earliest examples in the collection have wrapper-type endleaves added to the book block.<sup>25</sup> They were primarily made from previously unused parchment, but a small fraction incorporated recycled parchment manuscript waste. These wrapper-type endleaves consist

25. “Wrapper-type endleaves”: <<http://w3id.org/lob/concept/3573>>; accessed 7 January 2019.

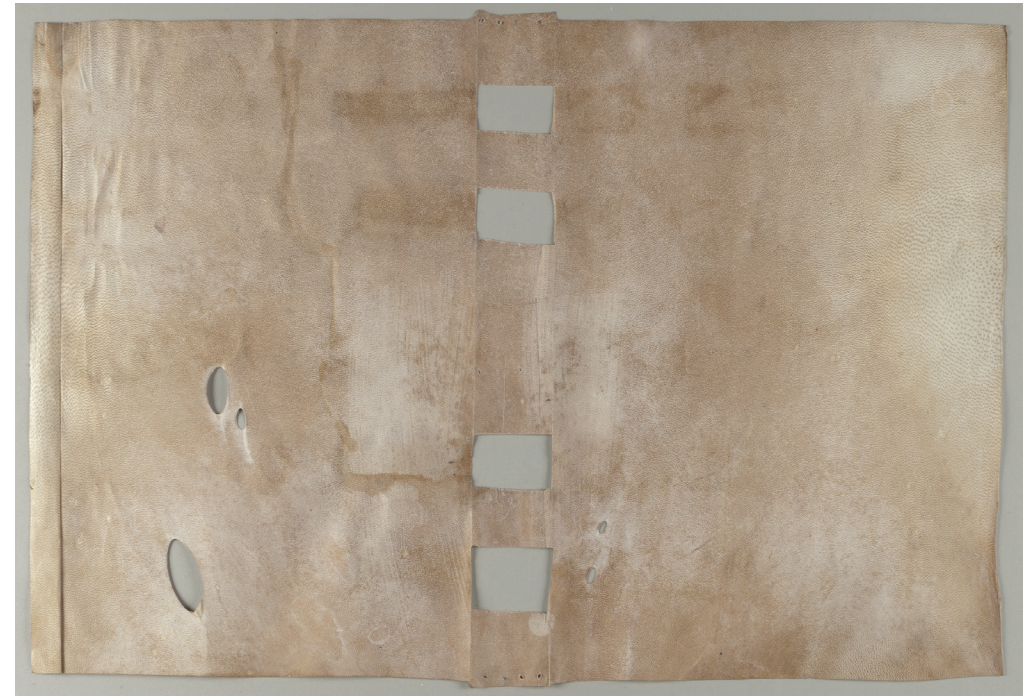


Fig. 16. Parchment wrapper endleaf with slots cut out to accommodate the thongs. Additional tabs along the spine were captured by the endband tackets. Medici v. 552, 1518–1522.

of a single piece of parchment that wraps around the back of the book block to create a front and back endleaf. Slots were cut on the wrapper spine to accommodate the sewing-support thongs and allow the endleaf wrapper to nestle close to the back. These slots were cut into wide lozenge shapes to allow the spine tackets to pass through easily, without having to pierce the parchment wrapper. Fig. 16. The wrapper-type endleaf was cut to the height of the book block with a small tab extending at the head and tail of the spine. These tabs left just enough material for the endband tackets to pierce through, thereby securing the wrapper endleaf along with the cover. A few of the larger ledgers had wrapper endleaves with turn-ins secured with tackets at the head, tail, and fore edge.

The wrapper endleaf was added after the book block and endbands were sewn, but before the cover was attached. Once the thongs were laced through the cover, the endleaf wrapper was locked in place. These wrapper endleaves provided significant protection to the book blocks, especially from the stiff edges of the parchment turn-ins, which could abrade and tear at the first and last leaves.

By the late-sixteenth century, the parchment wrapper endleaf was less used in favor of parchment or paper hooked endleaves.<sup>26</sup> With hooked endleaves, a small portion of a

26. “Hook-type endleaves”: <<http://w3id.org/lob/concept/1393>>; accessed 7 January 2019.





Fig. 17. Parchment maker's knife marks on the flesh side of the parchment. Medici v. 498, 1441-1444.



Fig. 18. A whole skin of parchment was used to make this cover. Medici v. 552, 1518-1522.

single leaf is folded in along the spine edge. The folded edge is then hooked around the first and last gatherings, and sewn through during the primary sewing of the book block. The parchment hooked endleaves consisted of either blank parchment or recycled manuscript-waste parchment, but the paper hooked endleaves commonly consisted of a blue paper; see Fig. 23. None of the bindings in this collection had pastedowns applied to the inside of the cover, leaving the turn-ins and underside of the lacings completely exposed.

#### PARCHMENT BINDINGS

Over eighty percent of the collection is bound in limp parchment with a fore-edge flap extending from the back cover.<sup>27</sup> The covers were constructed of a single skin of parchment folded with the whiter flesh side out and the darker hair side in. Notations in the binding refer to the covers being made from sheep parchment, which was confirmed with peptide mass fingerprinting (PMF)-MALDI analysis.<sup>28, 29</sup> The curving knife marks from parchment production are often visible across the outer surface of the cover, which discolors unevenly with use and age. Fig. 17. Typically, the whole animal skin was used with very little trimming of the natural parchment edge. The spine of the cover was positioned perpendicular to the spine of the animal, which runs across the middle of the binding. The neck of the animal was often positioned toward the fore-edge flap. Fig. 18. The cover was made with a square, extending just past the endbands at the head and tail. The fore edge was given little to no square, allowing the flap to wrap smoothly around the front cover.

When constructing the case, the head and tail turn-ins were folded first, followed by the fore-edge and flap turn-ins. Depending on the size of the animal, the width of the turn-in could vary dramatically. Generally, the turn-ins were wide enough to be caught by the lacings of the head and tail overbands. Sometimes, however, the head and tail turn-ins were so wide that they nearly meet in the middle. Fig. 19. Other times, the stationer was trying to squeeze the book into whatever skin was available, thus creating narrow turn-ins that sometimes needed extra reinforcement. Fig. 20. These turn-ins were open between the tackets and lacings, and often served as a pocket to hold (or hide) little notes or loose documents in the book, surmised because several folded documents were found in "turn-in" pockets during

27. "Limp covers": <<http://w3id.org/lob/concept/1423>>; accessed 7 January 2019.

28. Peptide mass fingerprinting (PMF) involves the enzymatic digestion of proteins followed by Matrix Assisted Laser Desorption-Ionization Time of Flight mass spectrometric (MALDI) analysis of the resultant peptide mixture. In the case of skin or hide, collagen is the major constitutive protein, and for each mammalian source, the amino-acid sequence of collagen is unique. Thus the mixture of peptides is unique – a "peptide mass fingerprint." Marker ions in the MALDI spectra from known reference materials are compared with those from unknown samples for identification.

29. Dan Kirby, conservation scientist in private practice, Milton, Mass., analyzed five volumes with PMF-MALDI protein analysis. His results, reported to the author on 25 November 2015, were: 5/5 limp-parchment covers were sheep, 4/4 alum-tawed sewing supports were cattle, 5/5 alum-tawed lacings were sheep, 1/5 leather overbands was goat and 4/5 leather overbands were sheep, 1/1 parchment book-block wrapper was sheep.



Fig. 19. Wide head and tail turn-ins, nearly meeting in the middle of the cover. Note that the turn-in tackets are placed toward the middle of the cover where needed. Medici v. 534, 1492-1496.



Fig. 20. Narrow turn-ins were reinforced with an additional parchment piece. Note that the turn-in tackets are placed close to the edge where needed. A small folded note was discovered inside the turn-in. Medici v. 560-5, 1547-1552.

the project. The corners were rarely cut or trimmed; rather, the two sides were overlapped fully producing a thickness of two turn-ins or four thicknesses of parchment.

The envelope flap usually extended halfway across the cover, ending roughly where the overbands ended, which allowed the corresponding fastenings to meet in the middle. Once the dimensions and the position of the triangular point of the flap were determined, a cut would be made from that location out to the edge of the parchment. Above and below the cut, the parchment would be folded, forming the diagonal creases characteristic of the envelope flap shape. The final proportional relationship between the triangular section and the inner rectangular section is roughly 1 to 2. Fig. 21.

In this collection, the turn-ins are held down by tackets that were formed using a narrow strand of alum-tawed skin passed through two holes pierced on the outside of the parchment cover. On the inside, the two ends are tied together, then each end is passed under the tacket again, to create a twist on the inside, forming a loop. Fig. 22a. One volume had an unusual turn-in tacket that was threaded through three holes, the ends of the strand exiting the central hole as a pair, which were then cut off at the surface. Fig. 22b. On the front cover, two turn-in tackets were positioned vertically along the fore-edge turn-in, parallel to the spine. And on the fore-edge flap, the tackets were usually positioned parallel with the diagonal edge. The turn-in tackets were put wherever they were needed, depending on the width of the turn-in, sometimes in the very corner or other times closer to the middle of the cover; see Fig. 19. If the binder was trying to squeeze the book into a small skin and the edges of the turn-in did not quite overlap, a small slip of parchment may have been added to assist in anchoring the turn-in tacket; see Fig. 20.

The fore-edge flaps of limp-parchment bindings were always made in a pentagonal (envelope flap) shape. The fore-edge flap served to keep notes and other loose papers safely inside the book. Because these books were heavily used, a fore-edge flap added a degree of protection to the text and may have aided in preventing the spine from shifting into a concave shape.<sup>30, 31</sup> A typical fore-edge flap extended over approximately half the width of the front cover, so the tip of the flap and the end of the overbands would meet in the middle for fastening. When the binder determined where the tip of the flap would be, a cut was made from that point out to the edge of the parchment, perpendicular to the spine. Above and below that cut, the parchment would be folded to form the diagonal creases. Because of the angle of the diagonal, the top and bottom turn-ins would overlap just inside the point of the flap, and later would be secured by the lacings or fastenings. Though there was some variation, the proportional relationship between the outer triangle and the inner rectangle of the pentagon was roughly 1 to 2.

Though these parchment bindings are considered limp, often the covers were reinforced in several different ways. Approximately one quarter of the bindings had the flap reinforced

30. Pickwood, Nicholas. "Tacketed Bindings – A Hundred Years of European Bookbinding." In *For the Love of the Binding: Studies in Bookbinding History Presented to Mirjam Foot*. Ed. David Pearson, 137. London and New Castle, Del.: British Library and Oak Knoll Press, 2000.

31. Metzger, "Colonial Blank Books," 107.



Fig. 21. Fore-edge flap turn-in. Note the natural edge of the parchment, showing the neck of the animal. This flap was reinforced with another layer of parchment. Medici v. 533, 1490–1492.



Fig. 23. Front cover reinforced with a thin pulpboard. Note the blue-paper hooked endleaf. Medici v. 568 v.10 (13), 1587–1596.



Fig. 22a. The outer and inner surface of the turn-in tacket. Medici v. 533, 1490–1492.



Fig. 22b. The outer and inner surface of an unusual type of turn-in tacket, found only on this volume. Medici v. 547, 1500–1503.

with a scrap of parchment tucked inside the turn-ins. This presumably added a little bulk to the flap but also helped to reinforce the fastening attachment; see Fig. 21. In this collection, bindings began to be reinforced with a thin pulpboard in the sixteenth century.<sup>32</sup> The pulpboard was cut to the size of the cover and placed inside the turn-ins. It was then secured in place by the turn-in tackets and overband lacings.<sup>33</sup> Fig. 23. It was not uncommon to see only the front cover reinforced, or a front cover and flap reinforced with the back cover left limp. Only rarely, and in the much later sixteenth-century examples, do all three (front, back, and flap) have pulpboard reinforcements. These pulpboard reinforced bindings also provided a convenient pocket for stashing notes, which could be tucked between the pulpboard and the cover along the spine edge.

Many bindings with buckles had a small elongated parchment piece added to the inside of the front cover. This parchment piece was positioned behind the center overband and secured in place by the lacings. If not for this reinforcement, the lacings could tear through the cover from use, where the buckle is attached. The elongated piece is rounded on one end and extends across the spine but does not protrude to the back of the cover. Fig. 24. Some bindings with buckles did not have this extra parchment reinforcement added, and the tug on the buckle during use often caused it to tear through the case, leaving the buckle and central overband detached along that edge.

32. “Pulp board”: <<http://w3id.org/lob/concept/1528>>; accessed 7 January 2019.

33. Not in this collection, but in the HBS Barberini collection, additional tackets were placed to hold the boards along the spine edge.

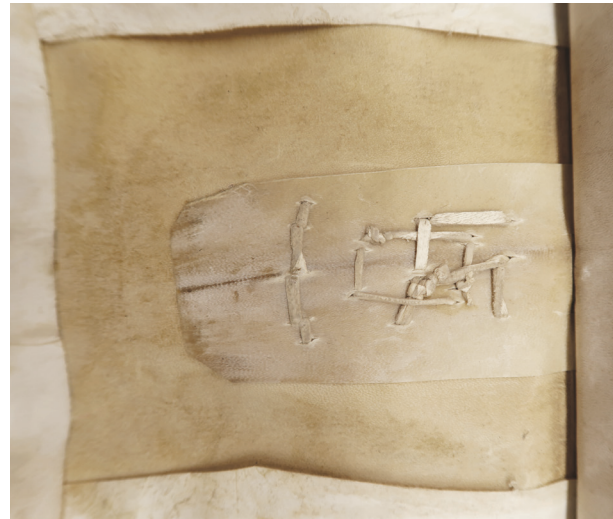


Fig. 24. Center overband reinforced with a strip of parchment. Medici v. 533, 1490–1492.



Fig. 25a. Secondary saltire tacket visible on the spine of the binding. Medici v. 551–2, 1508–1509.



Fig. 25b. Four punctures in book block from the saltire tacket. Note the unsupported link-stitch sewing. Medici v. 539, 1509–1521.

#### TACKETS AND COVER ATTACHMENT

The covers of stationery bindings were connected to the book blocks with tackets at the spine along the overbands and at the endbands. In this collection, the covers are all attached with secondary tackets, either loop or saltire.<sup>34, 35</sup>

Saltire is another term for a St. Andrew's Cross, and refers to a design motif that creates a cross or "X" pattern.<sup>36</sup> Books sewn with an unsupported link stitch were predominantly attached to their binding with a saltire tacket, identified by their two diagonal crossing elements along the spine. The saltire tacket would be positioned so that it crossed on the spine along the overband, and begins and ends inside a section, instead of between them as in a loop tacket. Figs. 25a–b. The tacket typically began inside the first gathering and exited towards the spine through two holes, approximately 1.5 to 2 cm. apart. The ends of the tacket then passed through two corresponding holes in the cover at the front edge of the spine. The ends of the tacket passed diagonally across the spine of the cover, creating the saltire pattern, and reentered two holes at the back edge of the spine, corresponding to holes in the last gathering. Inside the last gathering, the ends were twisted and often left long.<sup>37, 38</sup> Fig. 26.

Book blocks sewn on split thongs are tacketed to the cover with a loop tacket made from a strip of alum-tawed skin.<sup>39, 40</sup> The loop tacket did not enter the gathering but was positioned between the gatherings. Fig. 27a. First, a strip of tacketing material was positioned behind the support thong in between the gatherings, and each end of the tacket was passed through a hole pierced in the cover and overband corresponding with the thong.<sup>41</sup> On the spine, the tackets were twisted by passing the ends under each other repeatedly (in the manner of an overhand knot) and pulled taut. Fig. 27b. The tacket ends then reentered the holes on the opposite side from which they exited but only passed through the overband, not the cover. The ends of the tacket exited between the overband and the exterior of the cover, and then were cut flush with the edge of the overband. Along the outside of the cover, the tackets were evenly spaced, and the number of tackets per overband was determined by the thickness of the book. The outermost tackets were positioned just behind the first and last gathering,

34. "Secondary tackets": <<http://w3id.org/lob/concept/1565>>; accessed 7 January 2019.

35. A primary tacket will hold the book block together, as well as sometimes attach the cover. A secondary tacket attaches the book block to the cover, but depends on another method, such as sewing, to bind the book block.

36. "Saltire": <<https://en.wikipedia.org/wiki/Saltire>>; accessed 7 January 2019.

37. "Secondary tackets, saltire": <<http://w3id.org/lob/concept/1568>>; accessed 7 January 2019.

38. Medici v. 547 had a more complex saltire tacket with three crossing elements.

39. It is interesting that in this collection, all tackets were executed with alum-tawed skin. Whereas, many Italian books from different geographical areas or later examples are tacketed with twisted parchment.

40. "Secondary tackets, loop-type, twisted outside": <<http://w3id.org/lob/concept/1567>>; accessed on 3 January 2020.

41. The holes appear to have been made with an awl. A triangular-shaped hole with the material pushed from one direction was observed. No evidence of punched holes was noted in this collection.

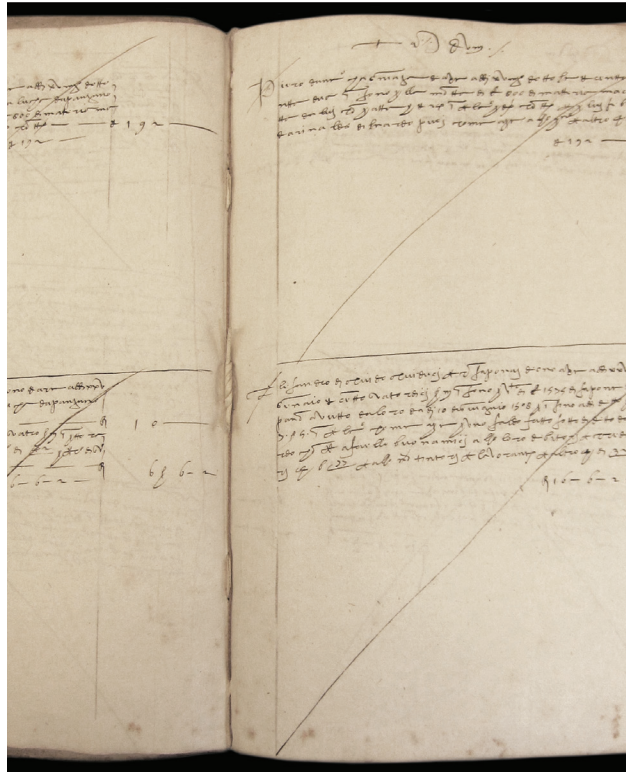


Fig. 26. Two saltire tackets positioned at the head and tail, seen here as loops in the gutter. Not to be confused with the twisted tawed ends in the center, which indicates the attachment of the loop fastening. Medici v. 551-2, 1508-1509.

Fig. 27a. Secondary loop spine tacket visible between the gatherings where it loops behind the sewing support. Medici v. 560-5, 1547-1552.



Fig. 27b. Secondary loop spine tackets visible on the spine of the binding. Medici v. 560-1, 1552-1555.

Fig. 28. Alum-tawed thong laced through the front cover, visible when the detached overband is lifted. Note the fragment of lacing that pierces through the center of the thong. Medici v. 542-1, 1482-1490.



and for a very thin volume, these may be the only tackets. Additionally, the thong sewing supports were also used to attach the front cover. The unsplit end of the thong was laced through slits in the joint of the front cover. Fig. 28. The split end of the thong was not laced through the back cover, but left free inside the back cover. This allowed for easy attachment of the spine tackets, but also allowed additional gatherings to be added later, if necessary, independently sewn onto the ends of the split-thongs.<sup>42</sup>

Additionally, tackets were applied to the endbands to further reinforce the attachment of the cover. Over eighty percent of the volumes have endband tackets that were looped over the core, passing through two holes in the cover and knotted on the spine. Figs. 29a-b. The number of endband tackets depended greatly on the thickness of the book block. Twelve bindings had a transverse endband tacket that consists of a single loop running laterally along the front of the core, exiting through the cover along the spine at two holes, and finishing with a knot; see Fig. 50.<sup>43</sup>

#### OVERBANDS

Overbands are leather or alum-tawed straps applied across the front cover, spine, and back cover. The skin used for the overbands was thick and strong in order to strengthen the tacket attachment along the spine and support the lacings and fastenings. The overbands were roughly 5 cm. wide and extended in length from the middle of the front cover, across

42. When additional gatherings were added, the folds in the cover were shifted to accommodate the added thickness. Subsequently, the fore-edge flap would end up barely reaching over onto the front cover, a clear indication that something had been added.

43. Transverse endband tackets, discussed below, were only found on the stiff laminated bindings.



Fig. 29a. Three alum-tawed endband tackets loop over the core and are knotted on the spine. Medici v. 567-4, 1569-1577.



Fig. 29b. Endband tackets knotted on the spine. Medici v. 560-1, 1552-1555.

the spine, to the middle of the back cover. The proportions varied greatly and were directly related to the size of the volume. On bindings fastened with a buckle, the center overband was longer on the back cover and extended beyond the edge of the fore-edge flap to be used as a strap for the buckle; see Figs. 36, 40, 48b, and 55. The overbands were evenly placed from head to tail across the spine of the cover, regardless of how the book was sewn. On volumes sewn over split-thong supports, the position of the overbands had to correspond with the location of the laced thongs through the front cover; see Fig. 28. Over seventy-five percent of the collection had three overbands (fifty-eight examples) or five overbands (forty-five examples). Figs. 30b and 30d. Less common were bindings with two overbands, (twenty examples), which were always found on bindings with unsupported sewing and saltire spine tackets. Fig. 30a. There were only four examples of bindings with four overbands. Fig. 30c.

Sixty-five percent of the overbands were made from tanned leather, usually dark brown in color, and the remainder were alum-tawed skin. This contrast of brown-leather bands over a creamy parchment cover is the predominant aesthetic in these stationery bindings, which is further contrasted with the white alum-tawed lacings. Though even in the twenty-five percent that have white alum-tawed overbands over parchment, the lacings were still executed in white alum-tawed skin; see Fig. 30b. Nineteen volumes had colored or dyed alum-tawed overbands, sometimes blue, pink, or green with the dye being applied to the flesh side of the skin. The colored overbands were positioned with the flesh side facing out because that surface more readily takes the dye. Whereas the tanned leather or undyed alum-tawed overbands were always attached to the cover with the hair side out.



Fig. 30a. Two-overband layout. Medici v. 540, 1520-1521.



Fig. 30b. Three-overband layout. Medici v. 533, 1490-1492.



Fig. 30c. Four-overband layout. Medici v. 560-5, 1547-1552.



Fig. 30d. Five-overband layout. Medici v. 554-2, 1567-1570.

Most overbands were made from a thick, stiff skin that was applied directly to the cover. However, a third of the overbands were laminated to paper and only fifteen percent to parchment to stiffen and strengthen the overband strap. This technique became more common in the later sixteenth-century bindings, where it appears thinner and lower quality leather was used. The ends of the overbands were commonly shaped with the corners cut back at a diagonal and often with a blind line impressed or tooled around the perimeter of each band; see Fig 30d. The overbands do not appear to have been adhered to the binding, instead they were held in place solely by the lacings and tackets.

#### LACINGS

The lacings comprise the most iconic and striking feature of these stationery bindings. Almost all of the lacings were executed with white alum-tawed skin as the material, even over white overbands.<sup>44, 45</sup> The lacings were passed through holes pierced in the overband and the cover in a manner that creates a decorative pattern on the outer surface. Figs. 31a–g. The decorative patterns consist of a series straight lines or crossing diagonals, sometimes with loops over the intersecting lines, and sometimes, they extend off the overband at the corners and edges. Not purely decorative, the lacings also anchor the leather thongs to the front cover as they pass through holes in the overband near the front joint.

The alum-tawed strands were passed through holes that were likely pierced with an awl. The holes in the leather overbands do not appear to be punched because no material appears to have been removed. It is difficult to be certain of this because the holes have an amorphous shape due to the softness of the leather.<sup>46</sup> On the other hand, the hole left in the parchment has torn into a triangular shape, being pushed towards the inside of the binding, and with no material removed around the hole. These observations would indicate that the hole was pierced.

It is uncertain how the alum-tawed strips were laced through the cover and overband. In one volume, a flat metal needle, similar in shape to leather lacing needles available today, was found broken off between the overband and cover. In another volume, the ends of the lacing material were not trimmed, and they had long, delicately twisted tails.<sup>47</sup> Fig. 32. This narrow end could have been used with a regular eyed needle, a round hollow needle, or possibly even fed through the holes unassisted. Upon completion, the lacing ends may have been dampened slightly to help harden the alum-tawed twists. Some sources suggest that the lacings on the inner surface of the cover were lightly hammered to flatten them.<sup>48</sup>

44. Eight were laced with a flat, woven silk ribbon. Ribbon lacings were only found on the front cover of the laminated bindings; back covers of these bindings were laced with alum-tawed laces; see Fig. 52.

45. Parchment lacings have been observed on later Italian examples and on bindings from other geographical locations.

46. Holes were clearly punched in the strap for the buckle attachment.

47. This twisted shape to the end of the lacing would not have been compatible with a flat leather lacing needle, which would need a wider surface for the teeth of the flat leather lacing needle to grip.

48. Bearman, “Laced Overband,” 198.



Fig. 31a. Single X with looped center. Medici v. 543-1, 1503.



Fig. 31b. Three-legged X with looped center. Medici v. 509, 1482-1486.



Fig. 31c. Long double Xs with looped center. Medici v. 533, 1490-1492.



Fig. 31d. Double Xs with looped centers. Medici v. 554-2, 1567-1570.



Fig. 31e. Small double Xs. Medici v. 554-2, 1567-1570.



Fig. 31f. Double Xs with straight lines. Medici v. 560-5, 1547-1552.



Fig. 31g. Double Xs with straight lines with extra Xs in the middle. Medici v. 554-2, 1567-1570.



Fig. 32. The twisted ends of the lacings were not cut off here, a possible clue as to how the lacings were executed. Medici v. 533, 1490–1492.

The puzzle of filling in the pattern in one pass required some degree of planning to avoid unnecessarily reusing holes already laced.<sup>49</sup> Typically, one set of parallel lines of the pattern were laced, followed by the intersecting lines, which were woven over and under the opposing lines to build up the pattern. Even though the outside pattern is crisscrossed, the inside lacing is usually quite orderly and regular, leaving only vertical connecting strands with an occasional horizontal path. Figs. 33a–b & 34a–b. However, some variation on the inner surface of the lacing path was observed, which could be a helpful clue to link bindings to stationers; see Appendix. In order to maintain the hair side visible on the outer surface of the binding, the lacing would be twisted on the inner surface or twisted as it was fed through the lacing hole. It seems, whenever possible, the pattern was executed with a single strand, but sometimes additional material would be attached midway through a panel. The lacing material was most often finished with a knot at the beginning and end, which was tied onto a nearby lacing span. Though less frequent, the ends might be wrapped around a lacing span, in a similar twisted manner as the turn-in tackets.

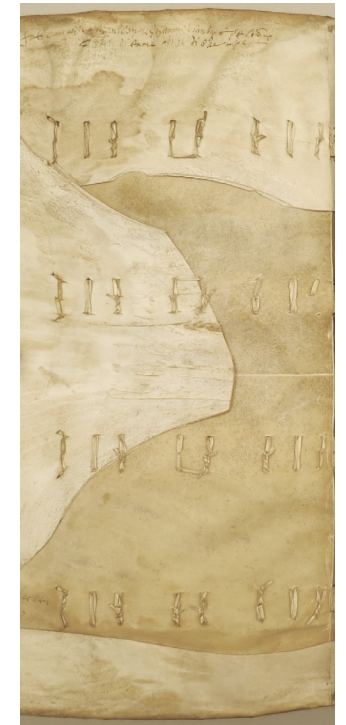
Without common terminology to refer to these lacing patterns, simple names were assigned by the team to roughly describe the pattern. The earliest volumes in the collection had very simple patterns, such as a single loop or single X with a looped center, often with an extra loop at the end of the overband. Fig. 35. Found in over half of the bindings, the most common patterns consist of a grouping of double Xs at either end of the overband connected by straight lines (“double Xs with straight lines”), or groupings of two or more large double Xs with a loop over the center of the X (“large double Xs with looped center”). The looped center is necessary to anchor long strands that could be pulled, stretched, and broken during use. Sometimes the center loops were executed with a separate strand of lacing material, or the end of the main pattern would extend to the loops in the center; see Appendix.

49. Numerous lacing patterns were traced on polyester film, outside and inside, which were used to help reverse engineer the pattern, noting knots or twists to indicate the beginning and end of the pattern, as well as locations where two strands shared a path on the inside of the cover; see Appendix.

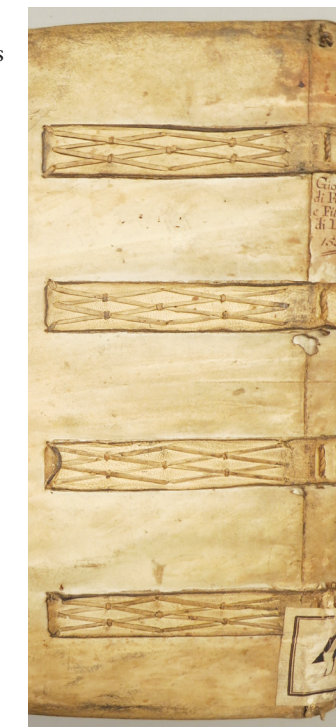
Left: Fig. 33a. Lacings, front cover, outer surface. Double Xs with straight lines with extra Xs in the middle. Medici v. 567–2, 1556–1568.



Right: Fig. 33b. Lacings, front cover, inner surface.



Left: Fig. 34a. Lacings, back cover, outer surface. Double Xs with looped center with extra loop in the middle. Medici v. 567–2, 1556–1568.



Right: Fig. 34b. Lacings, back cover, inner surface.







Fig. 35. Single-loop lacing, earliest example in the collection. Medici v. 491, 1376–1396.



Fig. 36. Lacing design on flap matches the front-cover design. Center overband pattern differs from other overbands on front cover. Medici v. 554-2, 1567–1570.

Other common pattern variations include a large single X with looped center, a three-legged X with looped center, and a grouping of small double Xs. Regularly, two different patterns are found on a binding. The front cover commonly had a more elaborate pattern, such as the double Xs with straight lines, while the back cover had a more economical pattern, such as the large double Xs with looped center. The pattern, consisting of large double Xs with looped center, used significantly less material and was much quicker to execute. The lacing pattern for the central overband with buckle would often be compressed or shortened to allow room for the buckle and keep attachment, or a different pattern would be used. Seen more on the front when the book was closed, the lacing pattern on the flap would almost always reflect the pattern of the front-cover overbands, not the pattern of the back cover. Fig. 36. A single X was often used to hold the overband strap onto the hinge of the flap.

## FASTENINGS

### *Buckles*

The buckle and strap is the most common type of closure, found in nearly sixty percent of the bindings in the collection. The buckles were primarily composed of an iron-containing metal, likely steel, though several were found to be made of brass.<sup>50</sup> Based on the tool marks observed, the buckle frame was filed into shape in the final stages, though it is uncertain if the buckle frame was cut from a metal sheet or made from a metal rod. The metal rod could be bent, hammered flat, and finally shaped with files. The most common buckle shape consists of an elongated hexagon with a square profile in the center hole. Figs. 37a–b. The prong formed from a separate tapered piece of metal was wrapped around one long edge of the hexagon, and the other long edge was fitted with a roller bar to allow the strap to slip past.<sup>51</sup> The roller bar was either formed from a bent piece of sheet metal or a coiled metal wire. Several horseshoe-shape buckles were found in the collection. They were also made from an iron-containing metal, formed from a strip of metal bent into a U-shape with a prong post and a roller bar post attached to the ends through two pairs of holes. Fig. 38. Only one volume had a brass buckle with an ornate shape, which appeared to have been cast. Fig. 39.

The buckles were attached to the center overband on the front cover by first cutting a hole or slit in the overband for the buckle prong, then folding the end of the center overband around the heel of the buckle, turning it in beneath the overband and securing it in place with a few extra stitches of lacing material. These stitches sometimes entered the cover alongside the lacing material or were only threaded around the overband material. The center overband extended across the back cover and fore-edge flap and became a strap for the buckle. Many straps were made from two layers of skin laminated together and stitched

50. The type of metal used for the buckles was presumed by the color of corrosion offset onto the parchment cover. The presence of iron was indicated by reddish-brown corrosion, and a brass, or copper alloy, buckle was indicated by a green corrosion color.

51. See: < <https://en.wikipedia.org/wiki/Buckle>>; accessed 11 November 2019.



Fig. 37a. Hexagonal buckle, outer surface. Medici v. 496, 1431-1434.



Fig. 37b. Hexagonal buckle, outer surface. Medici v. 496, 1431-1434.



Fig. 38. Horseshoe-shape buckle. Medici v. 536-6, 1506-1513.



Fig. 39. Ornate brass buckle. Medici v. 554-2, 1567-1570.



Fig. 40. Leather strap with underside laminated with pink-dyed alum-tawed skin, stitched around the perimeter. Medici v. 558-3, 1541-1550.

around the perimeter, which helped to stiffen and strengthen the strap, but also aesthetically enhanced it with a contrasting color, such as white or pink alum-tawed skin paired with a brown tanned leather. Fig. 40. Holes were punched in the leather strap to use with the buckle. Very often a triangular grouping of three holes was punched at the tip of the leather strap, though its purpose beyond decorative could not be determined in the existing bindings of this collection.

A loop, called a keep or keeper, was added to secure the loose end of the strap after it was buckled. The keep was attached to the shoulder or joint edge of the central overband. Fig. 41. The stitching of the keep was localized to the overband material and did not reenter the parchment cover. To start the keep, a strand of alum-tawed skin would be fed through two holes on one side of the overband near the joint. Equal in length, the two strands were individually twisted and then coiled together to make a cable. Positioned on top of the overband, the free ends of this cable were then laced through four small holes on the other side of the overband, creating an X pattern, and finally knotted underneath the overband. While the keep is often missing, the extra stitches could still be observed along the shoulder of the center overband, indicating its former presence; see Fig. 40.

#### Ties

Ties were the easiest and quickest of the fastening types to attach and were made from tapered strips of alum-tawed skin. The ends of the ties were laced through three holes on the



Fig. 41. Keep, a loop that holds the belt strap; attachment starts along top edge and finishes with an X along the bottom edge. Medici v. 554-2, 1567-1570.

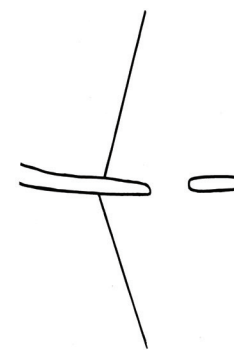


Fig. 42a. Tie-attachment method, outside cover.

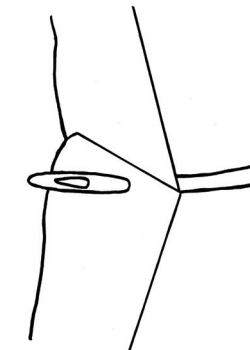


Fig. 42b. Tie-attachment method, inside cover.

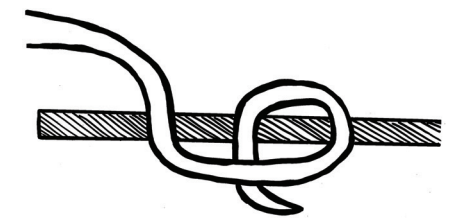


Fig. 42c. Tie-attachment method, cross-section.

cover and back through itself to lock it in place; see the drawing of this style in Figs. 42a-c. One tie would be positioned on the tip of the envelope flap, and the other tie would be placed where the flap meets the front cover.

Usually limp-parchment bindings with ties have a small patch of parchment or paper placed under the attachment point for the ties to prevent the tie tearing through the parchment cover. In this collection, that was rarely seen because the ties were always attached through the central overband over the lacings, often utilizing lacing holes, which offered plenty of reinforcement. Fig. 43. Ties did break off and were often replaced with a vegetable-fiber cord, either through the same holes or new holes made in the cover.

#### *Loop and toggle*

The least common fastening method observed was the loop and toggle with only twelve examples found in the collection, always on smaller format books. Figs. 44a-b. The toggle was made by wrapping a wide strip of alum-tawed skin (approximately 1.5 cm. wide) around a core of stiff tanned leather. Fig. 45. The end of the alum-tawed strip was then cut and tapered, allowing the end to lace through a hole pierced in the center of the tawed-wrapped leather core. This free end of the toggle was attached to the tip of the fore-edge flap through five holes, creating a cross pattern on the outside of the binding. Fig. 46.

A twisted strand of alum-tawed skin forms the loop. To make the loop, a strand of tawed skin was slightly dampened, then rolled with the hair side out, formed into a loop, and



Fig. 43. Alum-tawed ties attached through the end of the center overband and the tip of the fore-edge flap. Medici v. 600-5, 1556-1558.



Fig. 44a. Loop and toggle. Loop has been replaced with a cord. Medici v. 555-6, 1545-1546.

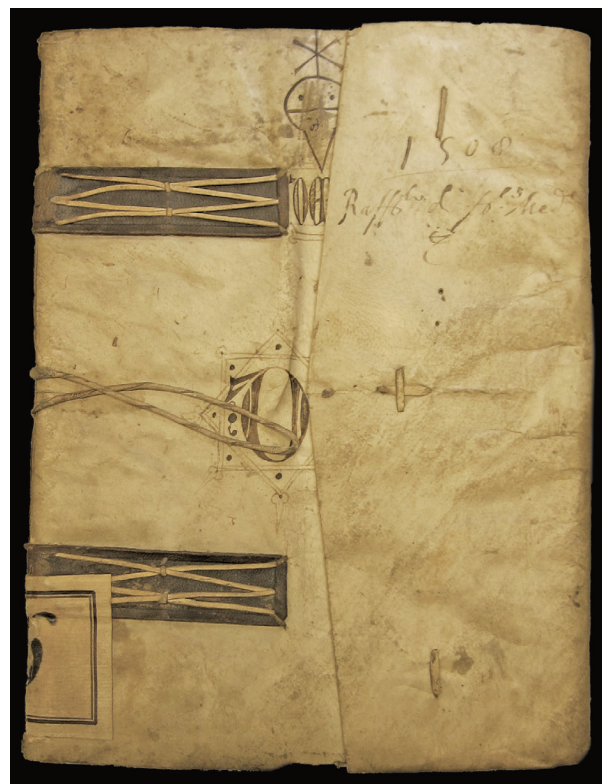


Fig. 44b. Loop and toggle. Toggle missing, original loop intact. Medici v. 551-2, 1508-1509.

Fig. 45. Toggle, attached to the tip of fore-edge flap. Medici v. 492, 1406-1419.

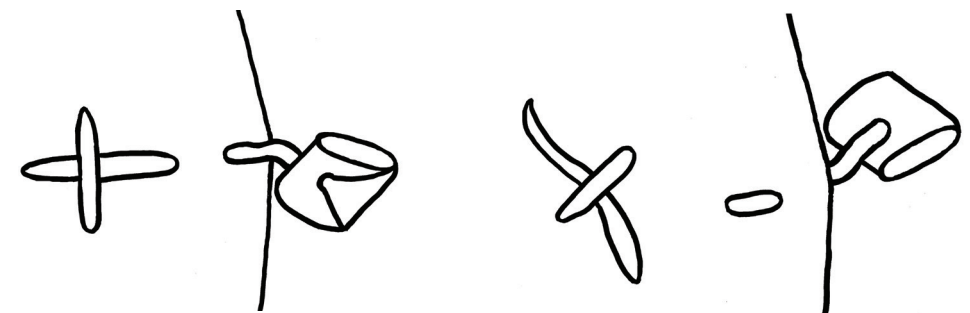


Fig. 46a. Toggle-attachment method, outside cover.

Fig. 46b. Toggle-attachment method, inside cover.

allowed to dry in this shape. The loop would then be fixed through the front joint, and either have the ends twisted together inside the front cover or inside the first gathering. Figs. 47a-b.

The loop and toggle appears to have been a very fragile closure method because in this collection, no examples were found with both toggles and loops intact. In fact, the loop seems to be the most vulnerable as only three examples have even a fragment of a loop, and only one remains intact. In many cases, all that remained of the loop was a small strand of alum-tawed strapping sticking out from the shoulder of the cover, which could be easily confused with a lacing fragment or something else. To an untrained eye, the attachment location of the loop could be mistaken for that of a potential spine tacket, an index attachment, damage, or just overlooked entirely.



Fig. 47a. Loop attachment inside front cover. Medici v. 558-4, 1555-1563.

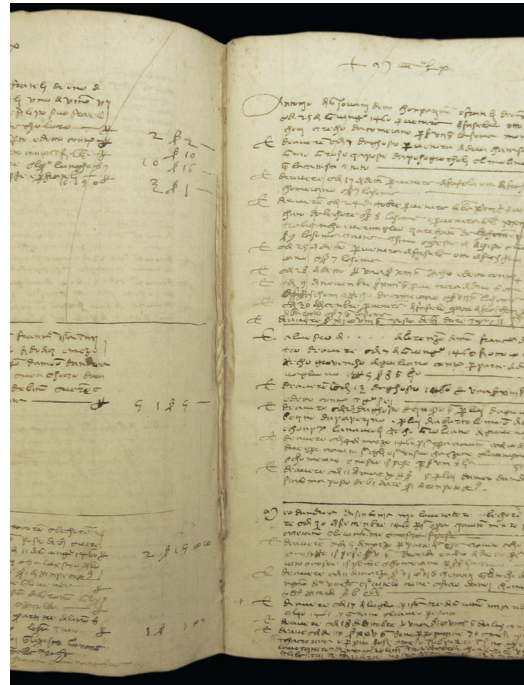


Fig. 47b. Loop attachment inside first gathering. Medici v. 503, 1458-1480.



Fig. 48a. Brown leather-laminated cover with scallop-shaped flap, five overbands laced with alum-tawed strips, fastened with buckle and strap. Medici v. 536-6, 1506-1513.



Fig. 48b. Alum-tawed skin laminated cover with scallop-shaped flap, five alum-tawed overbands laced with alum-tawed strips, fastened with a buckle and strap. Medici v. 532, 1488-1489.

LAMINATED BINDINGS

In this collection, twenty-one volumes are bound in stiff laminated covers instead of limp parchment. Figs. 48a-c. These bindings are sometimes referred to as leather archival bindings, though they can also be made from alum-tawed skin. The laminated cover consists of layers of either leather or alum-tawed skin, often with a core of pasteboard, sometimes constructed from printers' waste. Fig. 49. The inner surface of this laminate cover was usually lined with alum-tawed skin or parchment. The perimeter was stitched with one or two rows of colored threads for decoration but also to prevent the layers from inevitably delaminating. Half of the laminated bindings in the collection have perimeter stitching with two alternating colored threads. Fig. 50.

Laminated bindings are most often seen on the larger master ledgers and are more lavishly decorated. Structurally, they are very similar to the limp parchment bindings, aside from the covering material. The book blocks were sewn over split thongs and used parchment endleaf wrappers, though on these binding, the wrappers often had tacketed turn-ins. The endbands were enhanced with two-color secondary sewing over the primary endband sewing. One difference is that the endbands are often tacketed to the cover with a transverse tacket. Because the transverse endband tacket required making fewer holes in the cover, it makes sense that this endband tacket method would be used on the laminated bindings that would have been

Fig. 48c. Brown leather-laminated cover with ogee-shaped flap, five overbands laced with green-silk ribbon, fastened with a strap that feeds two grommets. Note the two rows of two-color edge stitching, alternating blue and white; see Fig. 50. Medici v. 568 v.2a (3), 1581-1583.





Fig. 49. Edge of cover delaminating, reveals printers' waste. Medici v. 560–1, 1552–1555.

more difficult to pierce. Additionally, the edges of the book block were often painted with floral designs or lettering, which was not seen on the limp-parchment bindings. Fig. 51.

On eight volumes, the front covers of laminated bindings were laced in colorful woven silk ribbon. Sometimes the overbands were first tacketed with a small loop of alum-tawed skin



Fig. 50. Two rows of two-color edge stitching, seen in Fig. 48c, alternating blue and white. Medici v. 568 v. 2a (3), 1581–1583.

at the corners, and a pattern would be fully executed on the band with the silk ribbon. Fig. 52. While the front cover was laced with ribbon, the back cover was always laced in alum-tawed skin, which is a more robust material able to withstand regular use. The fore-edge flap was also used as a decorative feature and often finished with a wavy or scalloped edge rather than a plain pentagonal shape; see Figs. 48b–c. On these bindings, the flap was most commonly coupled with a belt and buckle closure, though ties were also used. A few bindings in the collection have a different fastening system comprised of two metal grommets affixed to the flap and two to the cover; see Fig. 52. Though now missing, a wide fabric ribbon affixed with metal ends would have been attached through two holes on the cover. The ribbon would be laced through the grommets on the flap and tied shut. The leather and alum-tawed-skin covers were often blind tooled and stamped prior to



Fig. 51. Edge painting depicts the letter "A," indicating the first ledger of a business. Note the transverse endband tacket along the front edge of the endband in black oval. Medici v. 560–1, 1552–1555.



Fig. 52. Silk-ribbon lacing on front cover with small loops of alum-tawed skin at the end of the overbands. Medici v. 568 v. 2a (3), 1581–1583.

the overband attachment, because the tooling lines extend underneath. The covers were also tooled with the characteristic Medici owner's mark. Fig. 53.

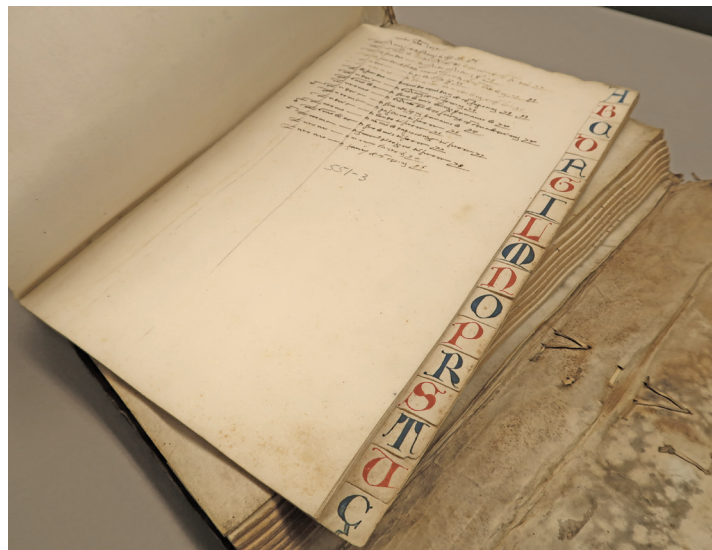
## INDEX

Each entry in a ledger was organized by an account. For convenience, each ledger contained an alphabetical index at the front of the book. The fore edge of the index had cut-out tabs with alphabetical letters inscribed in iron-gall ink. The index was typically the same height as the book block, but half the width. Constructed as a single gathering, the index was most often



Fig. 53. Characteristic Medici owner's mark blind-tooled on the leather-laminated cover. Medici v. 556–2, 1521–1523.

Fig. 54. Index with colored letter tabs, found loose at the front. Medici v. 551–3, 1509–1518.



tacketed through the fold with a primary loop tacket, but sometimes it was sewn through the fold with thread using a pamphlet stitch.<sup>52</sup> The index was covered in a single folio of either parchment or paper. Some indices were just tucked loosely inside the front of the ledger, while others were tacketed into the binding.<sup>53</sup> Fig. 54. The tacket would loop through the centerfold of the index and pass through holes pierced through the joint of the front cover, often through

52. Twenty-four indices were tacketed through the fold, while only four examples were sewn with thread.

53. Only three indices were bound into the text with a secondary loop tacket, while the other twenty-five were left loose inside the front cover.



Fig. 55. Large number of gatherings were removed from the back of the volume, causing the cover to deform. Medici v. 567–1, 1573–1579.

the center overband. On the outside, the tacket ends would be twisted and finished in the same manner as the spine tackets. In a few instances where the indices are missing, the remnants of the extra tacket along the spine provides the only evidence of its existence.<sup>54</sup>

#### CUT-OUT SECTIONS

Another interesting feature of this collection is that many volumes had noticeable portions of the book block cut away, which appears to be a contemporary practice. These gaps are often found at the back of the volume where much of the book block was left blank. When accounts were entered in the front and back simultaneously, blank sections in the middle of the book block were also removed. The sections were released from the binding by carefully cutting the thread in the centerfold of each section, which left the remainder of the book block securely intact. Such careful removal suggests that the blank paper was removed for reuse, and potentially done close to the time the volume was being used. The removed sections often left the covers unsupported, causing them to slump over time, but they remained completely usable. Fig. 55.

54. Later examples often have the index cut directly into the fore edge of the first gathering.

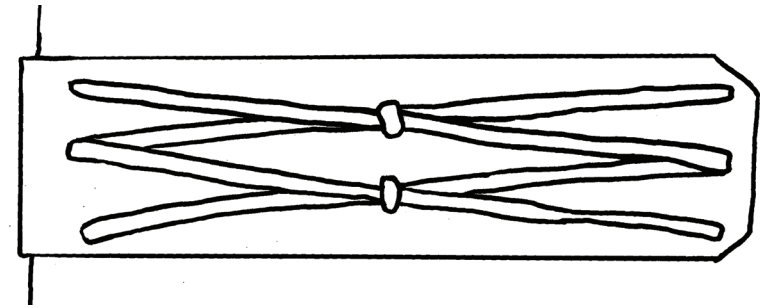
## CONCLUSION

Though thousands of stationery bindings line the shelves in archives in their native lands, it can be difficult to see the patterns and trends when presented with so many varied examples. The advantages of the HBS Medici Family Collection is that this discrete group of books gives us a snapshot into stationery bindings in Florence, while demonstrating subtle changes over time. As a book conservator, one must have a complete understanding of all the components of a binding before taking any interventive conservation action. Subtle details, such as small holes or fragments of material, might be the only remaining evidence of how an item was made or used. Conservators must tread lightly to preserve this information for future scholarly work. In a few brief visits to Italian archives, I was overwhelmed with the immense variety of stationery bindings and felt a strong conviction that more should be done to document their unique features. Hopefully this collection description can be a framework for comparison with other bindings and collections to have a better understanding of the whole of the stationery binding tradition in Italy.

## Appendix

Throughout the process of examining Italian stationery bindings, I have found examining the lacings, inside and out, tremendously useful in understanding how the patterns were created. It is too easy to focus solely on the outward pattern, neglecting the full path that was taken to achieve it. Did binders run out of material and tie on mid-way through, or would they rather use extra material to continue to the next passage just to bypass making a knot? Features observed on the inner surface of the lacing pattern can help us better understand how the binder was working and possibly link bindings to a single craftsman. Using a knot as a potential starting point, the pattern can be reverse engineered by taking into account which lacing lies over or under another.

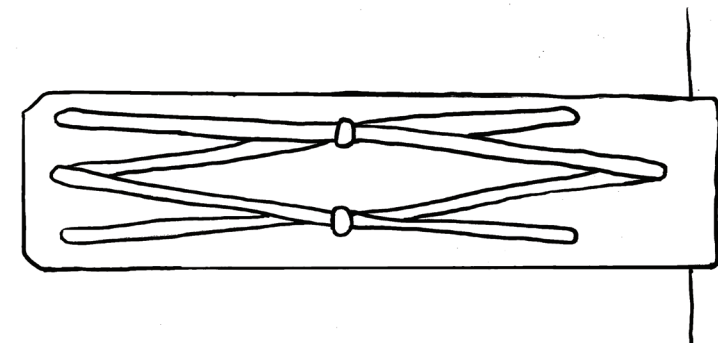
The diagrams that comprise the Appendix were rendered as accurately as possible based on my observations. The head of the volume is always oriented to be up on the page, and the spine edge is marked with a solid vertical line. Dashed lines within the lacings indicate the assumed path of missing material. Features to note are: 1) passages with two strands, knots, or twists, which indicate an end of a strand, 2) loops over crossing elements, which may or may not be executed with a separate strand, and 3) the sequence in which multiple lacings enter a single hole.



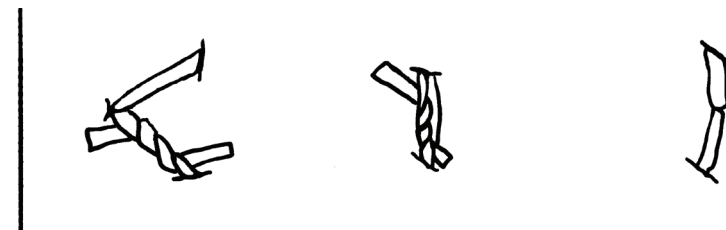
A.1a. Long double Xs with looped centers, outer surface. Medici v. 533, 1490–1492.



A.1b. Long double Xs with looped centers, inner surface. After finishing the long Xs, the lacing material extended on the inner surface to the center loops.

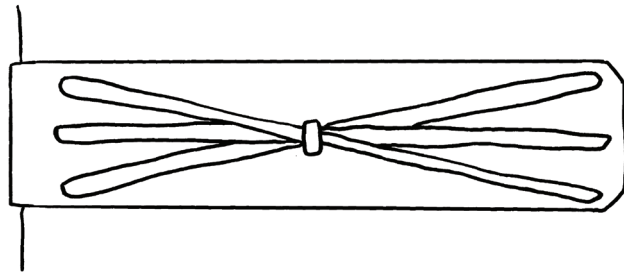


A.2a. Long double Xs with looped centers, outer surface. Medici v. 552, 1518–1522.



A.2b. Long double Xs with looped centers, inner surface. After finishing the long Xs, the lacing material was cut and finished with a twist. A separate strand was used to do the center loops, also finished with a twist.

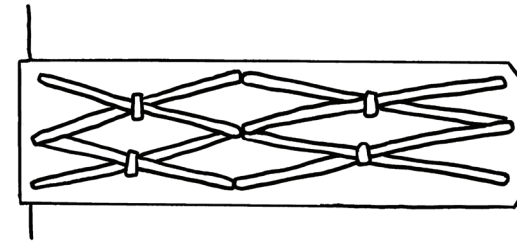




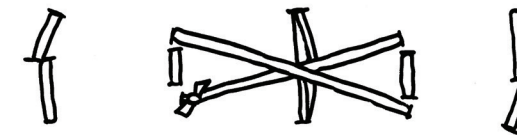
A.3a. Three-legged X with loped center, outer surface. Medici v. 509, 1476–1486.



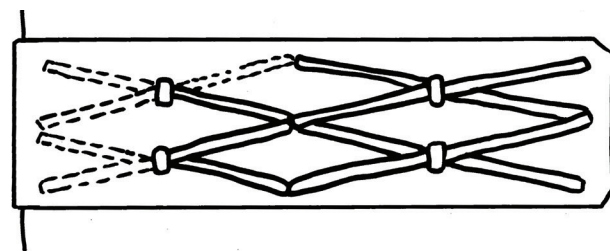
A.3b. Three-legged X with loped center, inner surface.



A.5a. Small double Xs with looped centers, outer surface. Medici v. 531, 1488–1492.



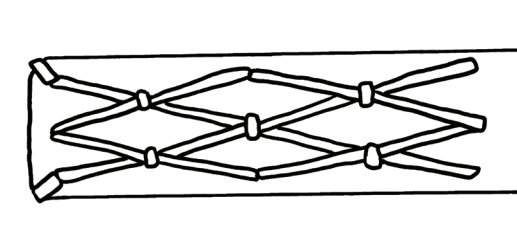
A.5b. Small double Xs with looped centers, inner surface. Both sets of loops are completed with a continuation of the same lacing material.



A.4a. Small double Xs with looped centers, outer surface. Medici v. 531, 1488–1492.



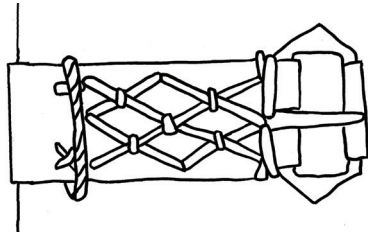
A.4b. Small double Xs with looped centers, inner surface. The looped centers are done with a continuation of the lacing material on one side, but the other set of loops is done with a separate span of material. Note that the center-most hole accommodates four strands of lacing.



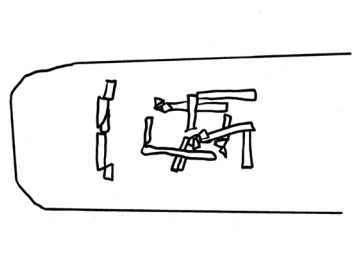
A.6a. Small double Xs with looped centers with extra middle loop, outer surface. Medici v. 551–3, 1509–1518.



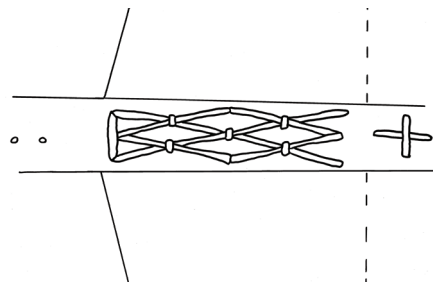
A.6b. Small double Xs with looped centers with extra middle loop, inner surface. Here the lacing material does not enter center-most point, instead the strands pass over this point and are held in place with a loop.



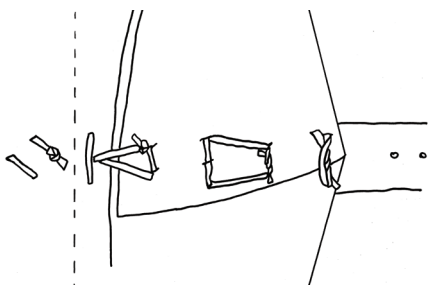
A.7a. Small double Xs with looped centers with extra middle loop, extra lacing for reinforcement on the flap tip and flap hinge, outer surface. Medici v. 533, 1490–1492.



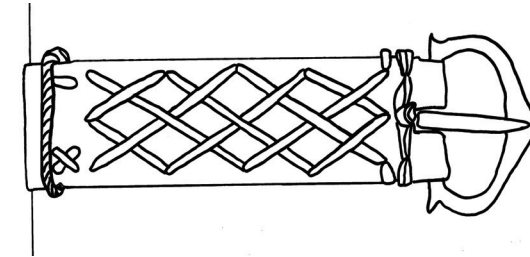
A.7b. Small double Xs with looped centers with extra middle loop, extra lacing for reinforcement on the flap tip and flap hinge, inner surface. Here the dashed line indicates the fore-edge fold in the flap. This pattern and the identical pattern of A.7 are both from the same binding, but here the execution on the inner surface is different.



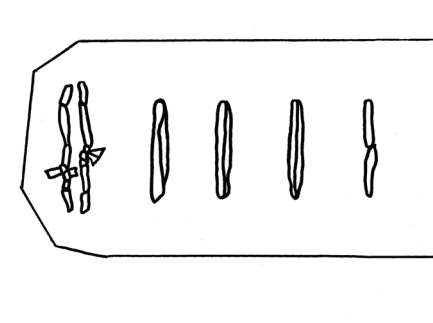
A.8a. Small double Xs, extra lacing for buckle attachment, outer surface. Medici v. 554-2, 1487–1490.



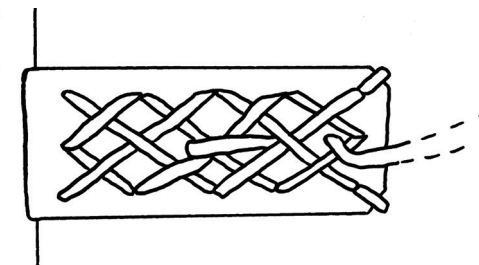
A.8b. Small double Xs, extra lacing for buckle attachment, inner surface.



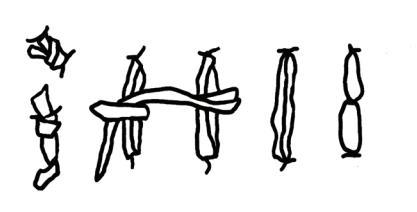
A.9a. Small double Xs, extra lacing for tie attachment, outer surface. Medici v. 568v.1b(2), 1556–1561.



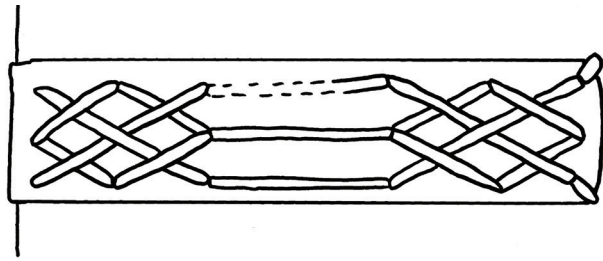
A.9b. Small double Xs, extra lacing for tie attachment, inner surface.



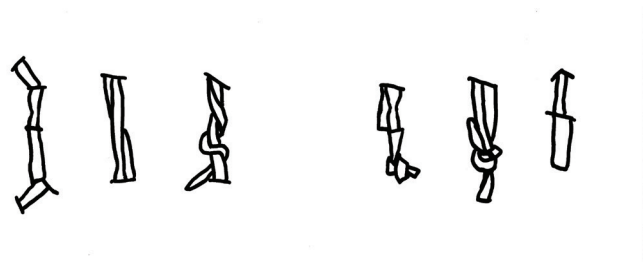
A.10a. Small double Xs with looped centers with extra middle loop, extra lacing for buckle attachment, outer surface. Medici v. 533, 1490–1492.



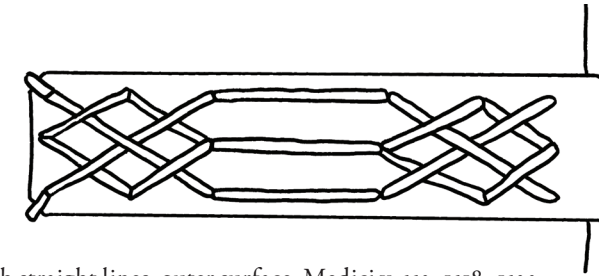
A.10b. Small double Xs with looped centers with extra middle loop, extra lacing for buckle attachment, inner surface. While this pattern is identical to A.6a, the inner surface is executed very differently. Note the extra lacing passages that relate to the attachment of the buckle, but the attachment of the keep does not extend through to the inside of the cover.



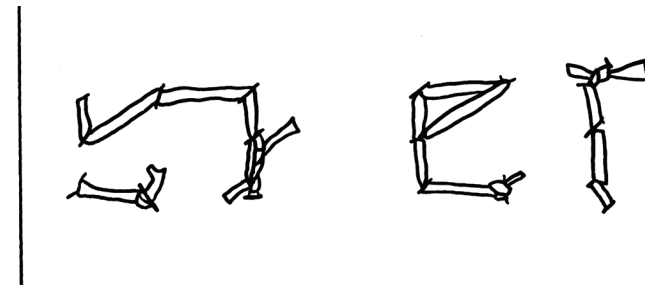
A.11a. Double Xs with straight lines, outer surface. Medici v. 568v.10(13), 1587–1596.



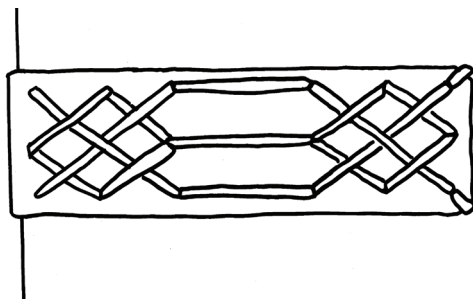
A.11b. Double Xs with straight lines, inner surface. This pattern is most often executed with only vertical passages on the inner surface.



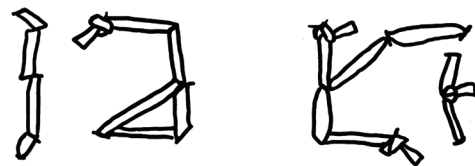
A.13a. Double Xs with straight lines, outer surface. Medici v. 552, 1518–1522.



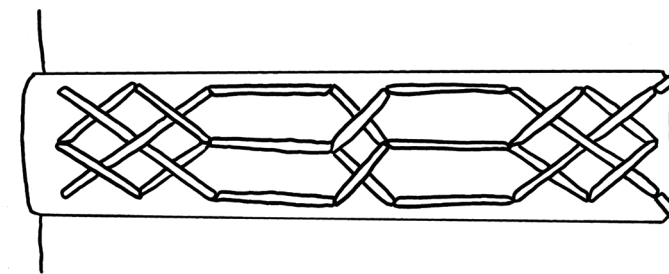
A.13b. Double Xs with straight lines, inner surface. Here the same pattern as in A.11 and A.12, but with the same irregular horizontal and diagonal passages as in A.12.



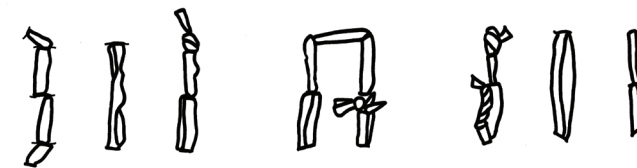
A.12a. Double Xs with straight lines, outer surface. Medici v. 551–3, 1509–1518.



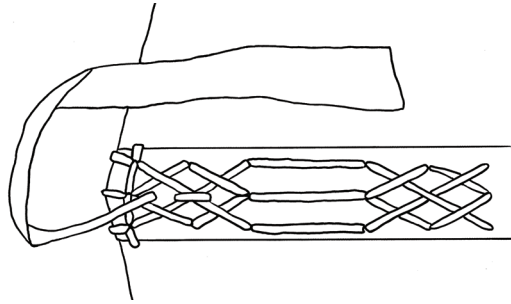
A.12b. Double Xs with straight lines, inner surface. Here the same pattern as in A.11, but the inner surface has irregular horizontal and diagonal passages.



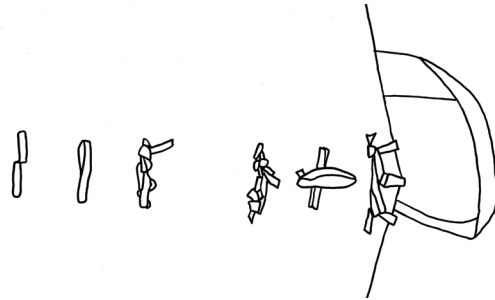
A.14a. Double Xs with straight lines with extra Xs in middle, outer surface. Medici v. 554–2, 1567–1570.



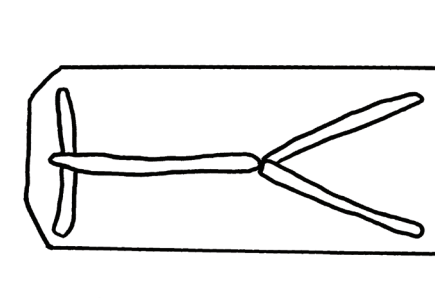
A.14b. Double Xs with straight lines with extra Xs in middle, inner surface.



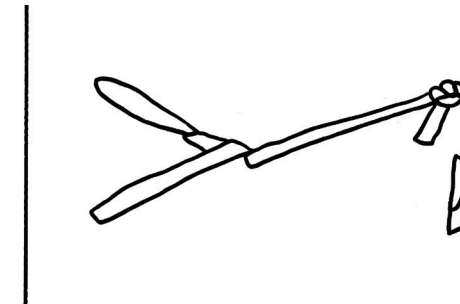
A.15a. Double Xs with straight lines with extra lacing at flap tip, outer surface. Medici v. 568v.10(13), 1587–1596.



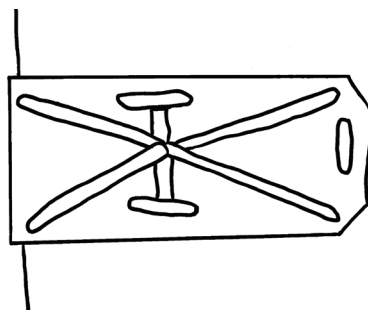
A.15b. Double Xs with straight lines with extra lacing at flap tip, inner surface.



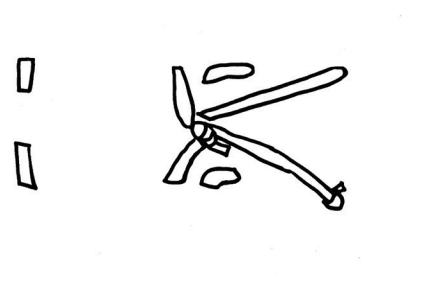
A.17a. Single Y-T, unique pattern, back cover, outer surface. Medici v. 500, 1447–1458.



A.17b. Single Y-T, unique pattern, back cover, inner surface.



A.16a. Single X-I with extra loop, front cover, outer surface. Medici v. 500, 1447–1458.



A.16b. Single X-I with extra loop, front cover, inner surface.

PERMISSIONS AND CREDITS

All volumes depicted are part of the HBS Medici Family Collection, Baker Library Special Collections, Harvard Business School. All photographs are taken by the author and are courtesy of Baker Library Special Collections, Harvard Business School. All drawings by the author.

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#### FRONTISPIECE CAPTIONS

- Fig. 1a. Limp-parchment binding with pentagon-shaped fore-edge flap fastened with alum-tawed ties. Three tanned-leather overbands laced with alum-tawed ties in a small double X pattern. Medici v. 567–1, 1573–1579. All books courtesy the HBS Medici Family Collection, Baker Library Special Collections, Harvard Business School.
- Fig. 1b. Limp-leather binding, flap missing, fastened with a metal buckle, strap missing. Three leather overbands laced with alum-tawed strips in a triple X with looped center pattern. Medici v. 520, 1476–1491.
- Fig. 1c. Laminated pink alum-tawed-skin binding with scalloped-edge flap, fastened with buckle and strap. Five pink alum-tawed overbands laced with white alum-tawed strips in a large double X with looped center pattern. Medici v. 529, 1487–1489.
- Fig. 1d. Limp-parchment binding with pentagon-shaped fore-edge flap, fastened with alum-tawed ties. Three alum-tawed overbands laced with alum-tawed strips in a double X with straight lines pattern. Medici v. 600–5, 1556–1558.
- Fig. 1e. Limp-parchment binding with pentagon-shaped flap; metal buckle and strap have been removed. Five tanned-leather overbands laced with alum-tawed strips in a double X and straight lines pattern. Medici v. 600–3, 1525–1531.
- Fig. 1f. Tanned-leather laminated binding with scallop-shape fore-edge flap, fastened with a metal buckle and strap. Five leather overbands laced with alum-tawed strips in a double X with straight lines pattern. Medici v. 551–3, 1509–1518.
- Fig. 1g. Limp-parchment binding with pentagon-shaped flap, fastened with loop (missing) and toggle. Two pink-dyed alum-tawed overbands with alum-tawed strips in a unique X-I pattern. Medici v. 500, 1447–1458.
- Fig. 1h. Oblong-format limp-parchment binding with pentagon-shaped fore-edge flap, fastened with a loop and toggle. Three tanned-leather overbands laced with alum-tawed strips in a double X with looped center pattern. Medici v. 536–3, 1505–1509.
- Fig. 1i. Limp-parchment binding with pentagon-shaped flap fastened with metal buckle and strap. The binding has an overcover made from a blue-dyed linen cloth. Medici v. 568 v. 3a (5), 1566–1569.