Versioning materiality: documenting evidence of past binding structures

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Abstract:

Describing the structure and materials of bookbindings is an essential task of the study of the history of the book. Books with repaired or replaced binding structures are of particular interest given that often evidence of one or even two or more previous structures remain on the book. The results of rebinding can be considered as separate versions of the binding structure. Evidence of the binding structures need to be matched with the corresponding version of the binding. This helps formulating provenance.

In this paper we discuss problems of documenting binding evidence including a) the reuse of earlier components in later bindings and b) the reuse of components originally belonging to other books. After a review of different approaches to the description of earlier bindings we focus on the CIDOC-CRM as a possible way of modelling the versions of bindings through an event-centric approach and offering a number of examples. Finally, we discuss the advantages of using the CRM for versioning as well as the limitations of our method.

1. Introduction

With versioning we often refer to keeping track of the changes of text (e.g. different versions of a report). In computer programming a plethora of tools allow changes in programming code to be tracked. Versioning allows developers to follow the history of a file over long periods.

In other fields of research, tracking the changes of material objects during their history is common practice. In archaeology, art history, conservation and other relevant fields, understanding changes of material objects leads to conclusions about their technology and use. In this paper, we propose the adoption of the idea of versioning to the description of material objects in order to capture the changing nature of an object over the centuries.

This is particularly important in the case of historic books. The book as a material object is a representation of the social, economic and cultural environment in which it was produced or modified (see for example McKenzie and also Darnton), because it can combine a variety of crafts (including sewing, carpentry, leatherwork, embroidery and gilding) and a variety of materials (from parchment to metal).

1.1. CIDOC-CRM

The Conceptual Reference Model published by the International Committee for Documentation – CIDOC-CRM (ISO) of the International Council of Museums (ICOM) has been an important influence in the development of this work. The CIDOC-CRM is a formal ontology. It defines concepts (entities) and relationships (properties) within the cultural heritage sector to model relevant activities. These entities are organised in hierarchies from the more general to the more specific. Generic entities (parent entities) contain more specific entities (child entities). Any child entity shares the characteristics of its more general parent entity. For example the entity *E5 Event* is the parent of both *E67 Birth* and *E69 Death*. *E67 Birth* is an *E5 Event*, but clearly not all *E5 Event*s are *E67 Birth*s, since we also have *E69 Death* among other types. The hierarchy formed with parent and child entities is often called an *IsA* hierarchy. Also, any characteristics of *E5 Event* (e.g. the fact that people

participate to events) are also applicable to the child entities. This is also known as *property inheritance*. For an introduction to the CIDOC-CRM, also see (Doerr).

The CIDOC-CRM has been tested successfully for many years resulting in a stable model. Because of this stability, the CIDOC-CRM could be used as an abstract blueprint structure for documentation systems. We have adopted it here to demonstrate our use of versioning.

The paper begins with some background information about historic bookbinding and the documentation of binding structures. It then introduces concepts from the CIDOC-CRM which are relevant to versioning bindings and it proposes a structure that can be adopted to document them. It examines a case study demonstrating the principles of that structure and it concludes with some points for discussion. Some bookbinding terms used in this paper may be unfamiliar to the reader. We are using these terms in italics followed by a citation to the term in brackets and single quotes. These are included in the references.

2. Dating bindings

Bookbindings are frequently ignored in descriptions of books and in library catalogue entries. However they often carry important information about where books have been, and therefore where they may have been read. This can be done by establishing chronological and geographical ranges for the use of particular techniques, materials and styles of decoration. The *textblocks* ('Textblocks') of books frequently have longer life than their bindings. Their bindings are often either repaired or (partly) replaced. The ability, therefore to identify and date these sequences of binding, rebinding and repair is critical to our understanding of the histories of individual books.

2.1. Rebinding books

Books would typically be rebound or repaired in response to damage or changes of fashion. For example, *covers* ('Covers') would be replaced when a library or a collector decided to update the appearance of their books. This would be done by completely replacing existing bindings, in which case only the *sewing stations* ('Sewing Stations') of the original structure will survive, or by replacing or covering the original covers with a new, perhaps more fashionable material, in which case the binding may well retain a first structure under a later covering. This has happened in many libraries, such as the collection of very early manuscripts in the Biblioteca Capitolare in Vercelli (Lombardia), where the original full covers were mostly replaced by *quarter covers* ('Quarter Covers') of *tanned* ('Tanned Skin') *sheepskin* ('Sheepskin') in the late seventeenth century, or the library of the Franciscan monastery of Šibenik in Croatia, where both the *boards* ('Boards') and covers of the bindings of their collection of incunabula were replaced in the eighteenth century by *laced-case* ('Laced Cases') covers of thick *cartonnage* ('Cartonnage') paper.

2.2. Reuse of components

During rebinding or repair, binders often used re-cycled material mostly from earlier books. For example, printed or written leaves from earlier books recycled as *endleaves* ('Endleaves'), covers, *spine linings* ('Spine Linings'), *board laminates* ('Board Laminates'), etc., or boards and covers from discarded or earlier bindings recycled for different books. Any description of bindings that attempts to date them based on these materials may therefore be misleading, as there may be a discrepancy of several centuries between the materials used. As the result of this phenomenon, a Romanesque manuscript in the library of Lincoln Cathedral now has two wooden boards of the same age as the manuscript, neither of which matches either the manuscript or each other, but both of which were used in the repair of the book in the nineteenth century.

2.3. Case study

A copy of Jacobus Philippus, De claris mulieribus, Ferrara, 1497 (figure 1), once in the Otto Schäfer collection in Germany, was described in an exhibition catalogue (Arnim) as having been bound in a contemporary binding with a cartonnage cover attached by lacing the *slips* ('Slips') of the leather sewing supports through its *joints* ('Joints (Features)'). This pattern of Italian laced-case cover is frequently found on bindings from the second half of the sixteenth century through to the nineteenth and if this binding were of the date of the text then it would be the earliest example known by almost half a century. A response by the author of the catalogue confirmed that the slips were part of the sewing supports and were original to the binding. An examination of the book in person a few years later in New York, led to these observations:

a) the existence of leather stains at the *head* ('Head') and *tail* ('Tail') of the spine edges of the outermost endleaf at each end of the book,

b) the cut ends of substantial *split-strap* ('Split-Strap Sewing Supports') white *alum-tawed* ('Alum-Tawed Skin') sewing supports showing in the joints and

c) the existence of a multiplicity of worm holes in the first and last few leaves.

These observation meant that the book was first bound in a contemporary *inboard binding* ('Inboard Bindings') with beech-wood boards (hence the wormholes - woodworm love beech wood) and a quarter cover of a dark reddish-brown tanned goatskin (hence the leather stains at the spine edge of the endleaves) of a typically Italian type (e.g. figure 2). The slips of tanned skin laced though the paper cover were in fact laced under the original alum-tawed sewing supports in circa 1600 to attach the new cover, possibly to replace the earlier worm-damaged boards. A drawing with this evidence is shown in figure 3. Because this sequence of events was not first identified and recorded, the binding was inaccurately described and its description was misleading. In section 3.3 we explain how a data structure based on the idea of versioning can be used to capture the multiple components from different periods on this book. We first introduce non-structured documentation records to show how traditional methods of record keeping are inadequate.

3. Records of bindings

3.1. Free-text records

As mentioned in the example of the Arnim catalogue, bookbinding descriptions are often produced using free text (i.e. in prose). This is because free text has been well-rooted as a documentation tool in relevant fields such as palaeography and conservation (approaches such as this by Campagnolo or Stokes et al. who employ structured records are still exceptions in the respective fields). Free text offers an immediate narrative which can be easily followed by a reader. It inherits the flexibility of spoken language and therefore it can be tailored to different audiences. A condition report of a binding, written by a conservator for other conservators, will be very different to an auction catalogue description written by an auctioneer for possible collectors/bidders. The free-text description of the changes on a book can tell the history of the specific book. To build a picture about a collection or a period, a researcher needs to interpret free text descriptions and insert important observations in a database to improve the capacity for searching and summarising data. This interpretation leads to structured data.

In the field of historic bookbinding, descriptions of bindings with structured data require typologies, i.e. lists of terms corresponding to varying characteristics of bookbindings as we explain next.

3.2. Structured records – types

A number of projects and researchers have adopted structured records for bookbinding descriptions because they allow easier summary of data. These are typically in the form of a question being represented by a field, to which an answer can be given from a list of options. For example, the field *"left board material"* corresponds to the question *"what material is the left board made of?"* and the possible entries/answers can be *wood, paper, tanned skin, alum-tawed skin, etc.* These terms define the types of material that a board can be made of. Ideally they should be organised as lists of terms in a controlled vocabulary or thesaurus where they can be retrieved through a lookup mechanism. When researchers retrieve types from the same controlled vocabulary or thesaurus, then it is possible to cross-search records from different collections. Examples of such vocabularies and thesauri are the thesaurus of the Rare Books and Manuscript Section of the Association of College and Research Libraries of the American Library Association ('RBMS Thesaurus') and more recently the Language of Bindings Thesaurus ('LoB').

The choice of fields/questions included in a structured record depends on its extent. Some records include hundreds of fields, such as the Saint Catherine Library survey (Velios and Pickwoad), while others include a small number of particularly significant fields such as the Wellcome Trust digitisation survey (Boal et al.). Most of these records focus on the current state of the binding, i.e. they include terms which describe the structure of the binding as it is at the time of the survey and not at the time that the binding was made. For example, it is expected to describe non-original *secondary covers* ('Secondary Covers') even if a binding only had a *primary cover* ('Primary Covers') when it was put together. This is useful for an accurate picture of the history of the object and for assessing the value of each binding component. The terms *primary* and *secondary cover* denote different types of cover based on the time that the cover was attached to the binding and define types of components based on time attributes, i.e. original or added at a later stage. Other examples are a) the distinct type of endleaves, called *inserted endleaves* ('Inserted Endleaves') which are defined as those which were added at a later stage, and b) the type of sewing for books that have been sewn more than once, which can be described as *current*, *previous* or *early*, depending on when each sewing was applied. There are two limitations when using types to describe time-related attributes of components:

1. Binding components added at different stages are mistakenly grouped together. In the example of the *inserted endleaves*, we may have two or more sets of endleaves added to a book at different times following the original binding. If we call all of them *inserted endleaves* we have no way to distinguish which set was first and which set followed.
2. Terms are arbitrarily created to cover earlier changes to a binding. In the example of the sewing structure we have allowed for the book to be bound up to three times (1 – current, 2 – previous, 3 – earlier). How can we then describe the rare occasion where an even earlier fourth set of holes exists?

In the next section we will show a model for data structures to include the sequence of events as opposed to implying them in types.

3.2.1. Previous experience

Binding survey work requires both direct observation of the current state of the binding and deductive thinking based on previous experience and understanding of binding structures. An experienced researcher is able to characterise evidence of absent components because of previous observation of such components on other bindings. To follow an earlier example, a set of currently unused sewing holes on the textblock is a strong indication that the book was bound using those holes in the past and that later it was rebound with the current set. The impression of a now missing thread in the spine fold of a bifolium between two unused holes is evidence of a thread once being present. Although the earlier sewing is not there, it is still possible to create a record of it through deduction. Therefore

deduction is already an important process when creating structured records of bindings and often it is interlinked with observation. We will return to this issue in the next section and also in section 5.1.

The definitions of types of components include concepts of time and sequence of events. The use of such terms requires both the observation of remaining evidence from a removed component and the deduction of the type of that component based on previous observations. In the next section we propose a way to formalise the expression of time in bookbinding description using the CIDOC-CRM.

3.3. Event-based records

In the previous section we explained that although the intention of bookbinding surveys may be to produce records of the state of the bindings at the time of the survey, they are also used to produce historical records of earlier states of the binding, through observation and deduction. We explained the limitations of object-centric records associated with terms. There is an important shift in the way that records of bindings should be conceived with the aim of overcoming these limitations: we are observing objects and deducing events that happened to these objects and therefore we should be creating records of events alongside records of objects. Events and objects are linked. Any event which may concern the history of a binding involves the object itself. The concept of a binding is persistent during the centuries of its history – it is the same object now as the one that the bookbinder created despite the many changes of its structure.

This leads to the question: when is a binding produced? Which events led to the production of the binding as a persistent object that we recognise and identify today and which events are modifications of that object? In many cases bindings were produced in stages. For example, often, a textblock would receive a temporary *stitched binding* ('Stitched Bindings') soon after printing. At a later stage it would have been bound with a more permanent binding to the order of a customer. It is likely that a researcher will consider the event of adding the permanent binding to the textblock as the point where the binding for this object was produced. Another researcher may be particularly interested in temporary bindings and therefore would consider the stitched binding as the point in time when the binding was produced. We could consider the point of the production of the binding as a subjective choice of the researcher but in general it is safer to consider the earliest evidence of an action involving the textblock with the intention to keep the leaves together as the point where the object is produced. This means that from that point onward an identifier can be assigned to the object which can be used for reference.

Word lists and vocabularies used in the domain tend to focus more on the types of persistent items, i.e. the binding and its components and less on events and actions which are necessary to describe what happened to the object. The concept of the technique describes the making of an object, but in bookbinding descriptions it is considered as a characteristic of the object (and not of the making of the object). The LoB thesaurus includes hierarchies for both types of components and types of techniques. The intention of the thesaurus is that techniques should not be used to describe persistent items (bindings) but instead temporal items (events). The LoB thesaurus has been built based on the philosophy of the CIDOC-CRM which is event-centric and a good candidate for describing the historical development of a binding.

Since the production of a binding there is a continuous timeline which we can use to describe the events that make up its history. Our observations reveal evidence from some of these events (a subset): these with the strongest impact or the *critical events*. In the same way that we may consider the starting point of the timeline subjectively, we may also consider the critical events subjectively based on previous experience. The records corresponding to the state of the object after each critical event can be considered as different versions of the binding.

Figure 4 shows an example of how CIDOC-CRM entities can be used to build a timeline for a binding. Further references to other entities will be made later in this document. Temporal entities describe events of the book while persistent entities describe physical components. The thick arrows indicate an IsA hierarchy. The properties of each entity are shown linking two entities with a normal arrow. Properties of the higher entities are inherited by the lower entities.

The starting point of the history of a binding can be considered as an *E12 Production* which links with *E24 Physical Man-Made Thing* (the binding) through property *P108 has produced*. At the same time *E12 Production* is an *E11 Modification* and therefore inherits the property *P31 has modified* which can be used to describe the fact that components (*E24 Physical Man-Made Thing*s) were formed in advance of the binding of the book and where then used during the binding process. Higher up the temporal group of entities, we can use the properties: a) *P14 carried out by* to indicate the person or workshop that undertook the binding, b) *P33 used specific technique* to indicate the type of the technique used, c) *P7 took place at* to indicate where the creation of the binding happened and d) *P4 has time-span* to indicate the period that we have established as time that the binding was put together.

Further modifications to the binding at the various critical events can be modelled as shown in figure 5. To make the figure more legible, we have removed the groupings and the parent entities in the persistent entities group. *E79 Part Addition,* which is a modification, features two properties: a) *P110 augmented*, indicating the binding which was altered because of an addition of a new component and b) *P111 added*, indicating the component which was added (e.g. a new set of endleaves). All properties from the higher entities still apply so we can mark this modification as an event at a different time-span and by a different bookbinder or workshop.

Figure 6 shows a similar arrangement of properties for removal of components from the binding (e.g. the removal of a cover prior to it being replaced by another). And figure 7 shows a more generic structure for modifications of the binding which cannot be considered as either additions or removals.

Previous research (Ravenberg) has shown that any change in a binding structure during conservation can be modelled by one of three options: an addition, a removal or a modification. We can also apply the same principle to any historic modification of the binding and therefore by modelling these three options we can arguably cover most of the historical activity on an object.

Each of these modification events are considered as marking different versions of the binding. These events can be assigned an identifier and therefore references to the corresponding versions are then possible. In the next section we demonstrate the kind of records which can be produced for the various versions of the bindings of the case study book.

4. Case study

In the example we described in section 2.3, observed evidence indicates that the book has had two critical events during its history: the first binding around 1497 and the later covering around 1600. Figure 8 shows a basic CIDOC-CRM structure we could use to map these events while recognising that there are other equally valid structures. The two binding events are at the bottom of the figure occupying different time-spans but both linked to our case study book. The property *P46 is composed of* is used to relate the book to its individual components. At this stage we make no statements about the period during which each component was present on the book. Much of the description of the book and components is done using terms from the LoB thesaurus and the property *P2 has type*. Even though the book no longer has its original boards, it can still be described as an *inboard binding* because the evidence is there to prove that the type *inboard binding* is applicable despite the fact that the boards are now missing. In the next section we will discuss the detailed expression of the activities altering the main components of the book and assigning periods to the existence of each component.

4.1. Boards

We consider an *E79 Part Addition* event labelled as *V1 Board addition*. The property *P117 occurs during* expresses the fact that the board was added while the event of binding was taking place. The property linking the event of adding the boards to the book is *P110 augmented* and the property linking the event of adding the boards to the boards is *P111 added*.

We then consider an *E80 Part Removal* event, labelled as *V2 Board removal,* which happens during a longer modification event of the book around 1600. The properties of *P112 diminished* and *P113 removed* relate the removal event to the book and the boards respectively.

4.2. Cover

The description of the covers also involves the addition of the component during the first binding and its subsequent removal from the book. However, in this case we also have a second cover (*E18 Physical Thing*) added to the book as a replacement cover during the *V2 Cover addition* event. Both the *V2 Cover removal* and the *V2 Cover addition* occur during the longer modification event. To express the fact that one cover was removed before the next one was added we can use the property *P120 occurs before*.

4.3. Sewing supports

Another variation of this model is applicable to sewing supports. The split-strap sewing supports from 1497 were trimmed during the *V2 Binding* event. Trimming means cutting the slips at a specific length to match the thickness of the spine. The length of slip removed is not a separate entity prior to its trimming and therefore it may be difficult to argue that it is a *E18 Physical Thing*. Perhaps it is safer to consider the trimming of the slips as a more general *E11 Modification* event which occurs during the longer *V2 Binding* event.

An example of the output of this process encoded using the Resource Description Framework is presented in the Appendix.

5. Conclusion and discussion

In this paper we considered records as different versions of a binding using an event-centric approach. We encourage the production of records of events related to objects. There are two basic limitations of object-centric terminology when it comes to capturing the temporality of a component, namely: a) mistakenly grouping components from different periods/versions and b) lack of scalability.

By switching to events we are able to describe any number of alterations/versions of components and we are able to separate components belonging to different versions.

Although we do not attempt to draw direct parallels with versioning tools in our discourse, adopting the principle of tracking changes is a useful model for describing the history of material objects. In the next sections we discuss some considerations which came up while modelling our case study.

5.1. Subjectivity

In this proposal we choose versions of the binding subjectively. Is it possible to be more objective about this choice? We think subjectivity is inherent in versioning. In computer programming it is up to the programmer to select the point when a new version of a file should be created. The choice of this point is subjective. In shared versioning systems there is an expectation that a committed change corresponds to a “bug-fix” or to the implementation of a new feature and therefore one could consider that these are more objective criteria for new versions. We can arguably apply the same principle to bindings. When re-attaching a torn leaf using *overcasting* (‘Overcasting’) or replacing a worn set of *endleaves* for the better protection of the *textblock*, a binder takes intentional action to fix the binding and perhaps this fix is a more objective criterion for setting new versions. Attaching a *bookmark* to an *endband* shows the need of marking the point in the text from which the reader needs to continue, therefore indicating a new feature of the binding. Perhaps new decorative or functional features are also valid objective criteria for setting new versions.

We do not intend to draw direct parallels between bookbinding history and programming but we are simply highlighting the wider issue of subjectivity in versioning.

5.2. Observation versus deduction

When experts survey bindings, they consider the evidence on the book under the prism of their experience. A sewing support which has been trimmed or broken at the joint may indicate the existence of longer slips and an earlier board or cover attachment. It is important to emphasise that the observation is only limited to the evidence on the book and that producing a record of the different versions of the binding is the result of deductive thinking based on training and previous experience. The proposed structure does not model any of these deductive processes. Because the records of the different versions of the object depend on these processes, perhaps a wider model to include inference methods should be considered. There is already extensive work in place to allow modelling and implementation of such a model (Doerr, Kritsotaki, and Boutsika; Stead and Doerr).

5.3. Identifiers

The capacity of the CIDOC-CRM model to scale according to the required detail of the resulting record means that in some cases a large number of identifiers need to be created to refer to each component and each modification event. In our case studies we have used a simplistic set of identifiers but a large scale survey project including versioning records would need a clear strategy on the production of identifiers considering the following issues:

- Persistence of identifiers: for how long would the identifiers need to be maintained and how would that affect migration to new systems?
- Repeatability of production: how is it possible to reproduce the same identifiers for the considered entities in the future?
- Human use: should human users (including developers) recognise entities by their identifiers?

5.4. Abstract schema

The abstract nature of the CIDOC-CRM model may reflect our understanding of the world accurately but it may appear alien to the domain expert. For example, referring to part addition and part removal events is unusual language for the book conservator. Describing the replacement of the cover using a series of part addition and part removal events with multiple links to the book and the various components is not intuitive and there is significant amount of work to be done if documentation systems based on versioning and the CIDOC-CRM are implemented for day to day work. It does, however, offer the possibility of recording complex data in a citable and structured way based on the observation of primary sources.

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6. List of figures

7. Appendix: Sample encoding in rdf/ttl

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@prefix w3id:  <http://w3id.org/> .
@prefix rdf:   <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix xml:   <http://www.w3.org/XML/1998/namespace> .
@prefix rdfs:  <http://www.w3.org/2000/01/rdf-schema#> .
@prefix exa:   <http://example.org/> .
@prefix crm:   <http://www.cidoc-crm.org/cidoc-crm/> .

# FIRST BINDING EVENT

exa:v1-binding  a            crm:E12_Production ;
      rdfs:label          "V1 Binding"@en ;
      crm:P108_has_produced  exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P4_has_time-span   <uuid:AA> .

<uuid:AA>  a                     crm:E52_Time-Span ;
      crm:P82_at_some_time_within  "1497"@en .

exa:v1-board-addition
      a                  crm:E79_Part_Addition ;
      rdfs:label           "V1 Board Addition"@en ;
      crm:P110_augmented     exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P111_added         exa:1497-boards ;
      crm:P117_occurs_during  exa:v1-binding .

exa:v1-cover-addition
      a                  crm:E79_Part_Addition ;
      rdfs:label           "V1 Cover Addition"@en ;
      crm:P110_augmented     exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P111_added         exa:1497-cover ;
      crm:P117_occurs_during  exa:v1-binding .

# SECOND BINDING EVENT

exa:v2-binding  a            crm:E11_Modification ;
      rdfs:label          "V2 Binding"@en ;
      crm:P31_has_modified  exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P4_has_time-span   <uuid:AB> .

<uuid:AB>  a                     crm:E52_Time-Span ;
      crm:P82_at_some_time_within  "1600"@en .

exa:v2-board-removal  a        crm:E80_Part_Removal ;
      rdfs:label           "V2 Board Removal"@en ;
      crm:P112_diminished     exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P113_removed        exa:1497-boards ;
      crm:P117_occurs_during  exa:v2-binding .

exa:v2-cover-removal  a        crm:E80_Part_Removal ;
      rdfs:label           "V2 Cover Removal"@en ;
      crm:P112_diminished     exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P113_removed        exa:1497-cover ;
      crm:P117_occurs_during  exa:v2-binding ;
      crm:P120_occurs_before  exa:v2-cover-addition .

exa:v2-cover-addition
      a                  crm:E79_Part_Addition ;
      rdfs:label           "V2 Cover Addition"@en ;
      crm:P110_augmented     exa:jacobus-philippus-de-claris-mulieribus ;
      crm:P111_added         exa:1600-cover ;
      crm:P117_occurs_during  exa:v2-binding ;
      crm:P120i_occurs_after  exa:v2-cover-removal .

# BOOK DESCRIPTION
```

```
exa:jacobus-philippus-de-claris-mulieribus
      a                  crm:E24_Physical_Man-Made_Thing ;
      rdfs:label             "Jacobus Philippus, De claris mulieribus"@en ;
      crm:P2_has_type        <http://w3id.org/lob/concept/1395> ;
      crm:P46_is_composed_of  exa:1600-slips , exa:1497-covers , exa:1497-split-straps , exa:1497-boards .

exa:1497-cover  a   crm:E18_Physical_Thing ;
      rdfs:label  "1497 cover"@en .

exa:1497-split-straps
      a                crm:E18_Physical_Thing ;
      rdfs:label          "1497 split-straps"@en ;
      crm:P2_has_type     <http://w3id.org/lob/concept/1626> ;
      crm:P45_consists_of  <http://w3id.org/lob/concept/1658> , <http://w3id.org/lob/concept/1369> .

exa:1497-boards  a          crm:E18_Physical_Thing ;
      rdfs:label          "1497 boards"@en ;
      crm:P2_has_type     <http://w3id.org/lob/concept/1222> ;
      crm:P45_consists_of  <http://w3id.org/lob/concept/2830> .

exa:1497-covers  a       crm:E18_Physical_Thing ;
      rdfs:label      "1497 covers"@en ;
      crm:P2_has_type  <http://w3id.org/lob/concept/1530> .

exa:1600-cover  a   crm:E18_Physical_Thing ;
      rdfs:label  "1600 cover"@en .

exa:1600-slips  a   crm:E18_Physical_Thing ;
      rdfs:label  "1600 slips"@en .

# TYPES FROM THESAURUS TERMS

<http://w3id.org/lob/concept/1658>
      a          crm:E57_Material ;
      rdfs:label  "tanned-skin"@en .

<http://w3id.org/lob/concept/1369>
      a          crm:E57_Material ;
      rdfs:label  "goatskin"@en .

<http://w3id.org/lob/concept/2830>
      a          crm:E57_Material ;
      rdfs:label  "beech"@en .

<http://w3id.org/lob/concept/1395>
      a          crm:E55_Type ;
      rdfs:label  "inboard bindings"@en .

<http://w3id.org/lob/concept/1626>
      a          crm:E55_Type ;
      rdfs:label  "split-straps"@en .

<http://w3id.org/lob/concept/1530>
      a          crm:E55_Type ;
      rdfs:label  "quarter covers"@en .

<http://w3id.org/lob/concept/1222>
      a          crm:E55_Type ;
      rdfs:label  "boards"@en .
```