

## **ECP 2005 CULT 038097/Bernstein**

### **Bernstein**

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***eContentplus***

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<sup>1</sup> OJ L 79, 24.3.2005, p. 1.

**The Bernstein Project**  
**Deliverable D 1.2**  
**Workspace demonstration version 1**

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## 1 Introduction

In the following chapters the workspace demonstration version 1 is described. The first prototype of the integrated workspace consists of

- a presentation of the integrated workspace
- an implementation of the component model search
- a demonstration of the bibliographic search
- a description of the server infrastructure

The first proposal for the design of the integrated workspace (mock-ups of user interface) is presented in the following chapters as screenshots (see Figure 1 – 9) and is also available online under <http://bernstein.iicm.tugraz.at/bernstein>. This proposal will be the basis for the discussion about the final functionality and design of the integrated workspace.

The first component model search prototype was implemented with three motifs “bull’s head”, “letter P” and “triple mount”. For each of these motifs about 250 different watermarks were described by components and altogether there are about 750 watermarks stored in the component database. The component search is shown as screenshots (see Figure 10 – 13) and can be tested online under <http://bernstein.iicm.tugraz.at/bernstein>.

The demo-version of the bibliography was implemented with bibliographical data from the German National Library in Leipzig and is also shown as screenshots (see Figure 14) and also available online under <http://dnb.cheshire3.org>.

The description of the server infrastructure includes the requirements for the hardware and the specification of the software which will be used.

## 2 Demonstration of the Integrated Workspace

The main structure of the workspace consists of the navigation panel on top of the page and the search overview section on the top left of the workspace. These main parts are always present guaranteeing simple navigation through the different sections of the page.

The navigation panel consists of the seven main parts of the site: Startpage (“About Bernstein”), Advanced Search, Specific Search, Component Search, Browse Motif, Bibliographic Search and Help section.

Above the panel there are three language change buttons for English, French and German symbolised by flags. In the following figures we assume that the user has selected ‘English’ as language.

The overview section is a main part of the search function. The user gets a (continually updated) overview of his search results and is able to select the databases, to specify the type of the search, to choose the sorting of the results and to limit the number of hits per page.

As long as the number of hits is too high, the user is only able to define further search options to limit the results. Below a predefined number of results (e.g. 200) the user gets further options to show the results of his search.

**Databases: HITS**

- Piccard ( 95000)
- WILC ( 16000)
- WZMA ( 8000)
- NIKI ( 1500)
- Others ( 0)

**TOTAL 120500**  Continually Update

**Find**  
   
**Sort Results by**  
   
**Hits per Page**

**Search Term in selected Databases and show number of Hits**

**NEWS**

- [Press-release APA](#), Oct. 2006
- [Half-year progress-report](#), Sept. 2006-Feb. 2007

**EVENTS**

- [General Meeting](#), July 9-10th, 2007, Fabriano
- Exhibition: "Ochsenkopf und Meerjungfrau. Wasserzeichen des Mittelalters", [Schottenstift](#), March 22nd-June 9th, 2007, Vienna
- Exhibition: "La testa di bue e la sirena. Filigrane del Medioevo", June 2007, Fabriano, Italy

The Bernstein Consortium produces a digital infrastructure for the expertise and history of paper based on images visualizing the paper's structure. The individual resources are databases of watermarks and other annotated features, image measurement software, contextual resources for cartography and bibliography, and an integrated workspace. Additionally the Consortium organizes tutorials and an exhibition on paper studies.

The Bernstein project is co-funded by the [European Commission, eContentplus program](#), from September 2006 to February 2009.

Figure 1 Startpage and Simple Search

## 2.1 Startpage and Simple Search

The entrance page to the workspace is kept very simple. This allows the user to get a quick overview of the functionality and to get short information about the site contents. The user also has the possibility to use the text search feature and to get the number of hits in the overview section. The text search is also kept simple and is based on the main features of existing search engines, with the option to clear the results ("RESET" Button) or to switch to the advanced search.

At the beginning all available databases are selected. As long as the search hits are above e.g. 200 the user has either to specify more details or to deselect some of the databases to see the results. Above this value the user only gets the number of hits.

In our example the user searches for motifs which include a bird and a crown and therefore types "bird crown" in the search field. After this the total number of hits decreases to 122 and the user gets an additional button to see the results ("Show Results").

The screenshot shows the search interface of the Bernstein Consortium. At the top, there are navigation tabs: "About Bernstein", "Advanced Search", "Specific Search", "Component Search", "Browse Motif", "Bibliographic Search", and "Help". To the right of these tabs are flags for Germany, the United Kingdom, and France.

On the left side, under "Databases: HITS", there is a list of checked databases with their respective hit counts: Piccard (107), WILC (8), WZMA (7), NIKI (0), and Others (0). Below this list, the "TOTAL" is shown as 122. There is also a checkbox for "Continually Update".

In the center, there are search options: "Find" (set to "Exact"), "Sort Results by" (set to "Database"), and "Hits per Page" (set to "20").

On the right, there is a search box containing the text "bird crown". Below the search box is a "Search Databases" button. To the right of the search box are buttons for "Advanced Search" and "RESET".

At the bottom left, there is a "Show Results" button.

Below the search interface, there are sections for "NEWS" and "EVENTS".

**NEWS**

- [Press-release](#) APA, Oct. 2006
- [Half-year progress-report](#), Sept. 2006-Feb. 2007

**EVENTS**

- [General Meeting](#), July 9-10th, 2007, Fabriano
- Exhibition: "Ochsenkopf und Meerjungfrau. Wasserzeichen des Mittelalters", [Schottenstift](#), March 22nd-June 9th, 2007, Vienna
- Exhibition: "La testa di bue e la sirena. Filigrane del Medioevo", June 2007, Fabriano, Italy

On the right side of the page, there is a paragraph of text: "The Bernstein Consortium produces a digital infrastructure for the expertise and history of paper based on images visualizing the paper's structure. The individual resources are databases of watermarks and other annotated features, image measurement software, contextual resources for cartography and bibliography, and an integrated workspace. Additionally the Consortium organizes tutorials and an exhibition on paper studies." Below this text is another paragraph: "The Bernstein project is co-funded by the [European Commission](#), [eContentplus program](#), from September 2006 to February 2009." To the right of this text is the European Union flag.

Figure 2 Simple Search with number of hits

After the click on the "Show Results" button the user gets a list of the results without images (thumbnails):

Databases: **HITS** Find

Piccard ( 107)

WILC ( 8) Sort Results by

WZMA ( 7)

NIKI ( 0) Hits per Page

Others ( 0)

**TOTAL 122**  Continually Update

Database	Ref Number	Motif	Place	Date
Piccard	<a href="#">41755</a>	Bird - Head - Above crown	Udine	1423
Piccard	<a href="#">41756</a>	Bird - Head - Above crown	Udine	1423
Piccard	<a href="#">41952</a>	Bird - Head - In shield - One watermark intersecting with chainline - Above crown	Annaberg	1521
Piccard	<a href="#">41953</a>	Bird - Entire figure - Above crown	Annaberg	1521
Piccard	<a href="#">42013</a>	Bird - Entire figure - Above crown	Freiburg, Breisgau	1582
Piccard	<a href="#">42014</a>	Bird - Entire figure - Above crown	Freiburg, Breisgau	1582
Piccard	<a href="#">42015</a>	Bird - Entire figure - Above crown	Freiburg, Breisgau	1599
Piccard	<a href="#">42474</a>	Bird - Entire figure - Above crown	Elsberg	1601
Piccard	<a href="#">42475</a>	Bird - Entire figure - Above crown	Ensisheim	1604 - 1615
Piccard	<a href="#">42592</a>	Bird - Entire figure - Above crown	Firenze	1493
Piccard	<a href="#">42593</a>	Bird - Entire figure - Above crown	Trient	1562
WILC	<a href="#">WMI58598</a>	bird, crown	Deventer	1485
WILC	<a href="#">WMI58585</a>	bird, crown	Richardus	1485
WILC	<a href="#">WMI58597</a>	bird, crown	Pafraet, Richardus	1485
WILC	<a href="#">WMI55109</a>	bird, crown	Antwerp	1491, 9 Feb
WILC	<a href="#">WMI53952</a>	bird, crown	Deventer	1489, 29 Jul
WILC	<a href="#">WMI53000</a>	bird, crown	Deventer	1488, 9 Aug
WILC	<a href="#">WMI52623</a>	bird, crown	Antwerp	1491, 11 Apr
WILC	<a href="#">WMI52622</a>	bird, crown	Antwerp	1491, 11 Apr
WILC	<a href="#">WMI01503</a>	bird, crown	Delft	1487, 1 Mar
You searched on: bird crown				<input type="button" value="Next"/>

Figure 3 Simple Search with results

This view consists of the database name, the reference number, a short description of the motif, the place and the date. Now the user is able to browse through the results or to see the thumbnails of the results.

**Databases:** **HITS** **Find**  
 Piccard ( 107)   
 WILC ( 8) **Sort Results by**  
 WZMA ( 7)   
 NIKI ( 0) **Hits per Page**  
 Others ( 0)   
**TOTAL 122**  Continually Update

**Search Term in selected Databases and show number of Hits**

Thumbnail	Database	Ref Number	Motif	Place	Date
	Piccard	<a href="#">41755</a>	Bird - Head - Above crown	Udine	1423
	Piccard	<a href="#">41756</a>	Bird - Head - Above crown	Udine	1423
	Piccard	<a href="#">41952</a>	Bird - Head - In shield - One watermark intersecting with chainline - Above crown	Annaberg	1521

Figure 4 Simple Search with thumbnails

When the user selects the “Show Thumbnails” button he gets a small picture preview of the watermark and the same short description as in the show result view before. In both views (the show result view and the view with the additional thumbnails) the user can click on the reference number to get all information of this single watermark.






[About Bernstein](#)
[Advanced Search](#)
[Specific Search](#)
[Component Search](#)
[Browse Motif](#)
[Bibliographic Search](#)
[Help](#)

Databases: **HITS** Find **Exact**

Piccard ( 107 )

WILC ( 8 ) Sort Results by

WZMA ( 7 ) Database

NIKI ( 0 ) Hits per Page

Others ( 0 ) 20

**TOTAL 122**  Continually Update

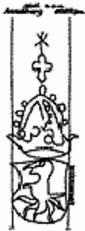
Picture	Information	
	Database	Piccard Online
	Ref Number	41952
	Motif	Bird - Head - In shield - One watermark intersecting with chainline - Above crown
	Place of Origin	Annaberg
	Originator	Hauptstaatsarchiv Stuttgart
	Depository	StA K A O. B. A.
	Date	1521
	Remarks	Bestand J 340
	Height	107 mm
	Distance of nearby chainlines	70 mm
Width	41 mm	
Reference Link:	<a href="#">41952</a>	

Figure 5 Watermark with picture

When the user clicks on the reference link he leaves the integrated workspace and goes directly to the watermark in the specified database in a separate window.

## 2.2 Advanced Search

Figure 6 Advanced Search

When the user likes to search with additional information he can switch to the advanced search directly from the simple search or from the navigation bar on the top of the page. In this case he is able to enter different values and options of the watermark. These values can be found in all of the databases. The result view is the same as in simple search, if the number of hits is low enough the user gets the option to show the results or to show the thumbnails as above mentioned at the simple search.

## 2.3 Specific Search

Figure 7 Specific Search

When there is a value that only occurs in one specific database or does not occur in one specific database, the user has the possibility to click on the specific search tab. In this case the user gets options that occur only in specific databases, with the information in which database he is searching respectively not searching.

## 2.4 Browse Motif

The interface features a navigation menu at the top with the following items: About Bernstein, Advanced Search, Specific Search, Component Search, **Browse Motif** (highlighted), Bibliographic Search, and Help. To the right of the menu are flags for Germany, the United Kingdom, and France.

On the left side, the 'Databases: HITS' section lists the following counts:

- Piccard ( 95000 )
- WILC ( 16000 )
- WZMA ( 8000 )
- NIKI ( 1500 )
- Others ( 0 )

**TOTAL 120500**

The main area displays a grid of 24 motif categories, each with a representative icon and a label below it:

- Crown
- Lily
- Mount 5 coupeaux
- Geometric motifs
- Anchor
- Leaf/flower/tree
- Letter
- Triple mount
- Fabulous creatures
- Figures
- Fish
- Fruit
- Bell
- Hand/glove
- Luminary
- Horn
- Hat
- Cross
- Bull's head
- REALIEN
- Serpent (snake)
- Key
- Mount 6 coupeaux
- Drinking vessel

Figure 8 Browse Motif – 1<sup>st</sup> layer

The integrated workspace also contains a motif browser. In this view the user gets an overview of the main watermark motifs. With a click on the designated watermark motif the user gets to the 2<sup>nd</sup> layer. This layer contains all sub motifs of the main motif selected from the layer above (two level hierarchy).

Figure 9 Browse Motif – 2<sup>nd</sup> layer

When the user moves the mouse over the picture, he gets additional verbal information about the sub motif in a small popup. Also the number of hits in the database overview is varying depending on the chosen motif from the top layer. Additional specifications in the advanced search field above may restrict the number of hits.

## 2.5 Component Search

**Watermark Search Engine**  
Component Model

RESET SEARCH  
 POL    WILC  
 NIKI    WZMA

**Search History**

**Motif (3)**  
 bull's head  
 letter P  
 tripple mount

**Chain Lines (3)**  
 + central chain line  
 + left chain line  
 + right chain line

**Global Shape (6)**  
 + brokenness  
 + orientation  
 + position  
 + profile  
 + stroke  
 + type

**Morphology (18)**  
 + basis  
 + central mountain  
 + counter  
 + crossbar  
 + dash  
 + ears  
 + eyes  
 + front  
 + head  
 + horns  
 + in-between horns  
 + lateral mountains  
 + nose

**Additional Elements (18)**  
 2-lobed flower or leaf  
 3-lobed flower or leaf  
 4-lobed flower or leaf  
 5-lobed flower or leaf  
 7-lobed flower or leaf  
 absent  
 circle  
 crown  
 five-pointed star  
 half-moon  
 latin cross  
 one letter  
 six-pointed star

**Search Results (749)**   **Style of View**    Summary    List    Thumbnails   **Displaying Results 1-749**

610 in database 'POL'  
 0 in database 'NIKI'  
 134 in database 'WILC'  
 5 in database 'WZMA'

Figure 10 Component Search entry page

The entry page of the component search lists all components of all available motifs and allows the user to get a quick overview of the functionality. Left on the top the databases can be selected and below the search history is shown. Also the motifs are listed on the left side. If the user selects one of the motifs the components are restricted to that motif.

The chain lines, the global shapes and the morphology with the available components are arranged in the middle of the workspace. All the available additional elements are listed on the right side.

The search results are shown at the bottom and the user can choose between summary (total number of hits), list (reference numbers) and thumbnails (reference numbers and images).

**Watermark Search Engine**  
Component Model

THE MEMORY OF PAPERS  
ESTABLISHED IN 1998 BY THE PAPERS SOCIETY OF AMERICA

Reset Search

POL  WILC  
 NIKI  WZMA

**Search History**  
central chain l.. > present  
k in history

**Motif (3)**  
bull's head  
letter P  
triple mount

**Chain Lines (3)**  
+ central chain line ✓  
- left chain line  
doesn't touch >>  
overlap >>  
tangent >>

**Morphology (18)**  
+ basis  
+ central mountain

**Global Shape (6)**  
+ brokenness  
+ orientation  
+ position  
+ profile  
+ stroke  
+ type

**Additional Elements (18)**  
2-lobed flower or leaf  
3-lobed flower or leaf  
4-lobed flower or leaf  
5-lobed flower or leaf  
7-lobed flower or leaf  
absent  
circle  
crown  
five-pointed star  
half-moon  
latin cross  
one letter  
six-pointed star

**Search Results (116)**

Style of View		
pol 60380	pol 60400	pol 60480
pol 61658	pol 61659	pol 61660
pol 64238	pol 71297	pol 71445
pol 79257	pol 79266	pol 79267
pol 150006	pol 150007	pol 150008
pol 150013	pol 150014	pol 150015

**Displaying Results 1-42**

60640	pol 61637
64236	pol 64237
78172	pol 79248
150004	pol 150005
150011	pol 150012
150018	pol 150019

Close

Figure 11 Component Search without motif (first step)

If the user selects central chain line "present" the number of hits is reduced to 116. After this the user selects the left chain line and clicks on the two Greater-Than Signs behind "overlap" to see some example images of overlapping left chain lines.

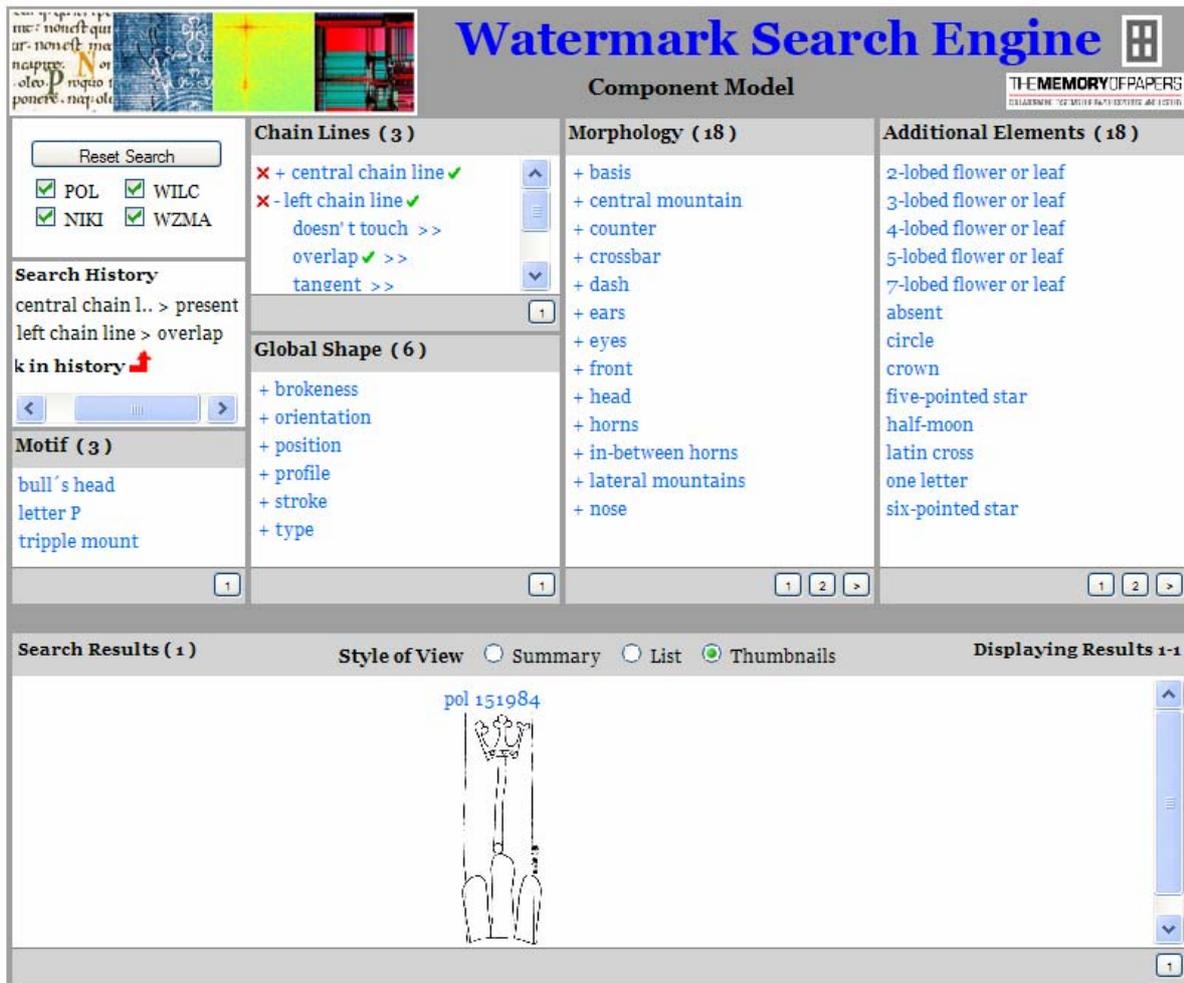


Figure 12 Component search without motif (result)

When the user then selects left chain line “overlap” there remains only one watermark fulfilling these characteristics. The search history shows all selections the user made – in our case “central chain line” is present and “left chain line” overlaps. If the user clicks on the watermark the location (database name), the reference number and the picture of the watermark in original size are shown in a separate window.

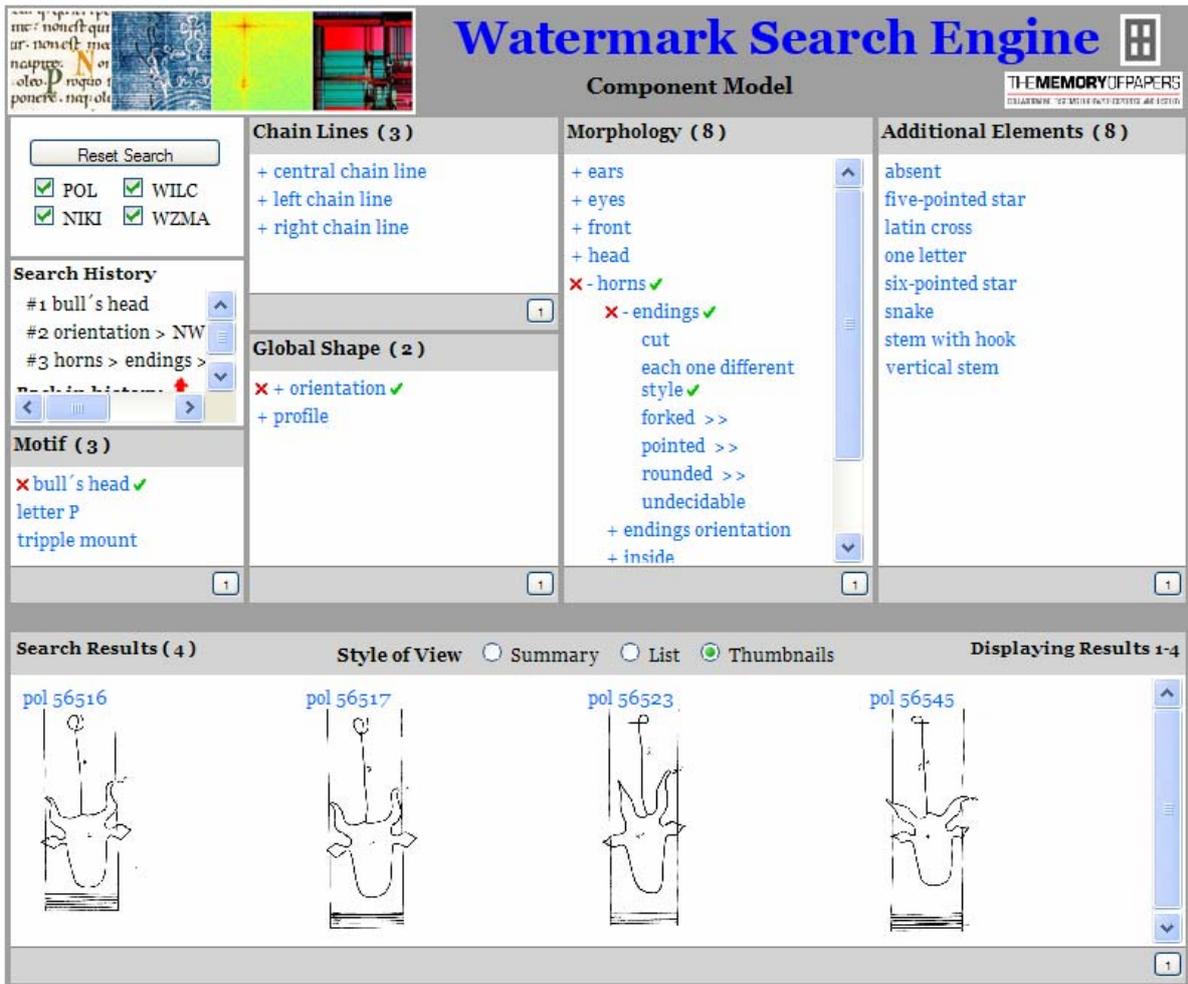


Figure 13 Component Search with motif

When the user selects the motif “bull’s head” the number of hits is reduced to 250 and after orientation “NW” and horns–endings “each one different style” there remain only four watermarks fulfilling these characteristics.

## 2.6 Bibliographic Search

With the demo-version of the Leipzig bibliographic database the user has the possibility to input a query and to select between “General Keyword”, “Title Keyword” and “Identifier”. When the user enters the search term “watermark” and selects “Title Keyword” following results are shown.

Identifier	Title	Classification
<a href="#">7017</a>	Heraldic watermarks or la heráldica en la filigrana del papel	8.3.24.
<a href="#">775</a>	Animals in watermarks	8.3.23.
<a href="#">3461</a>	Anchor watermarks	8.3.3.
<a href="#">8562</a>	The watermark „The Lune“ in Georgian manuscripts	8.3.10.
<a href="#">801</a>	Music in watermarks	8.3.16.
<a href="#">773</a>	Fabulous beasts in watermarks	8.3.6.
<a href="#">14663</a>	Two unreported watermarks	8.3.15.
<a href="#">11007</a>	All hot air and watermarks	8.3.7.
<a href="#">18429</a>	British watermarks: Martha Lay and Anne Blackwell	8.3.11.
<a href="#">8749</a>	The horn watermark	8.3.16.
<a href="#">251</a>	The Hibernia watermark	8.3.15.
<a href="#">17622</a>	British watermarks: Martha Lay and Anne Blackwell	8.3.11.

Figure 14 Bibliographic Search

### 3 Description of the Server Infrastructure

For the implementation of the integrated workspace we suggest following hardware and software. The hardware should be available from March 2008 (one year before end of project) until March 2014 (five years after end of project). Before this period the software can be installed at a test server at TUG or OEAW.

#### 3.1 Hardware

- Processor: dual high-end processor
- Memory: ~ 4 GB
- Storage: > 500 GB RAID-System (extendable!)
- Backup: tape storage

#### 3.2 Software (open-source)

- Operating system: Linux
- Database server: MySQL
- Web server: Apache
- Servlet engine: Tomcat
- Java SE 6
- Spring MVC Framework, Hibernate

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