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Attorney Docket No: S96-213/PROV

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 60/035,205  
Filed: 10 Jan 97  
Title: Improved Text Searching in Hypertext Systems  
Applicant(s): Lawrence Page  
Examiner: not yet assigned  
Art Unit: not yet assigned

TRANSMITTAL OF MISSING PARTS

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Sir:

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DATE OF DEPOSIT 3/28/97  
SIGNED: Thomas J. McFarlane DATE 3/28/97  
THOMAS J. MCFARLANE REG. NO. 39,299

RECEIVED

Transmitted herewith in the Provisional patent application identified above are:

- [X] Small Entity Declaration; and
- [X] A check in the amount of \$25 for the surcharge

Respectfully submitted,

*Thomas J. McFarlane*

Thomas J. McFarlane  
Reg. No. 39,299  
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Dated: 3/28/97

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EXHIBIT 2077

Facebook, Inc. et al.

v.



01/10/97

### PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53(b)(2)

Docket Number		<b>96-213</b>		Type a plus sign (+) inside this box -->	+
INVENTOR (s) / APPLICANTS (s)					
LAST NAME	FIRST NAME	M.I.	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)		
Page	Lawrence		Stanford, California CA		
TITLE OF INVENTION (280 characters max.)					
Improved Text Searching in Hypertext Systems					
CORRESPONDENCE ADDRESS					
THOMAS J. MCFARLANE 426 LOWELL AVENUE PALO ALTO					
STATE	CA	ZIP CODE	94301	COUNTRY	UNITED STATES

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- SPECIFICATION      Number of Pages: 25
- Drawing(s)          Number of Sheets: \_\_\_\_\_
- Small Entity Declaration
- Other (specify)

METHOD OF PAYMENT

- A check or money order is enclosed to cover the Provisional filing fee
- The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number \_\_\_\_\_

PROVISIONAL FILING FEE AMOUNT (\$): **75.00**

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

- No
- Yes, the name of the U.S. Government agency and the Government contract number are: National Science Foundation IRI-9411306-4

Respectfully submitted,

SIGNATURE: Thomas J. McFarlane      DATE: 10 JAN 97  
 NAME: THOMAS J. MCFARLANE  
 REG. NO.: 39,299

- Additional inventors are being named on separately numbered sheets attached hereto

THE COMMISSIONER OF PATENTS AND TRADEMARKS  
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71632 U.S. PTO  
01/10/97

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SIGNED	<i>Thomas J. McFarlane</i>	DATE	10 JAN 97
THOMAS J. MCFARLANE, REG. NO. 39,299			

Sir:

Transmitted herewith for filing is the provisional patent application of

Inventor(s): **Lawrence Page**

For: **Improved Text Searching in Hypertext Systems**

Enclosed are:

- Provisional Application Cover Sheet
- 25 pages of Specification
- \_\_\_\_\_ sheet(s) of drawings
- A verified statement to establish small entity status under 37 CFR 1.9 and CFR 1.27
- A check in the amount of \$75 to cover the filing fee.

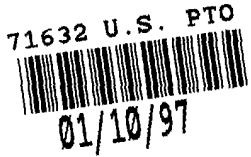
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Dated: 1/10/97

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S96-213



Provisional Patent Application of

**Lawrence Page**

for

**Improved Text Searching in Hypertext Systems**

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**FIELD OF THE INVENTION**

10 This invention relates generally to techniques for database searching. More particularly, it relates to improved techniques for hypertext database searching.

**DETAILED DESCRIPTION**

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The following appendix, attached hereto, provides a detailed description of the invention.

Appendix A: **24** pages;

TOTAL appended pages: **24** (description and drawings).

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APPENDIX A

# Improved Text Searching in Hypertext Systems

*There is a demonstration system, called BackRub, usually available at <http://zam.stanford.edu:1972/> from within Stanford. Or, contact me, [page@cs.stanford.edu](mailto:page@cs.stanford.edu) to arrange for a demo.*

## Introduction and Summary

Existing search engines on the web produce very poor results when the query matches large numbers of documents. Yet, these simple queries are very frequently issued by users. Described here is a system which yields radically improved results for these queries using the additional information available from a large database of web links. This database of web citations is used to determine a citation importance ranking for every web page, which is then used to sort the query results. This system has been implemented, and yields excellent results, even on a relatively small database of four million web pages. Not only does the system yield better results, but it does so at significantly reduced computational cost, which can be a very large expense for web search engines<sup>1</sup>. Demonstrating the improvement is as easy as picking a general query, for example "weather", and comparing the results to the results from a traditional web search engine, like AltaVista (the results section shows some sample queries).

## Motivation and Discussion of System

Only recently with the advent of the web, have large numbers of people started to frequently search huge databases. The indexable part of the web is currently at least 60 million documents totaling around 480 gigabytes<sup>2</sup>. AltaVista currently services 23 million user queries per weekday<sup>3</sup>. Many of these queries do not give people reasonable results, and improving this situation is a very important problem, especially as the web is growing very quickly<sup>4</sup>. The web search engines are the busiest sites on the entire web.

Many of the queries users perform in existing web search engines are simple one word queries which typically return tens of thousands of documents that match the query. This problem is only going to get worse as the web grows. Since people are only able to examine a handful of documents, only the highest ranked documents

<sup>1</sup>AltaVista is run on several large computers that each cost around a million dollars. And, every time they add another machine, the demand increases instantly to fully utilize the new equipment.

<sup>2</sup>I recently downloaded 30 million web pages, and estimated this figure.

<sup>3</sup>From <http://altavista.digital.com/>.

<sup>4</sup>Some researches have claimed that the web has been doubling in size every 6 months or so.

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