

图书情报理论与实践研究丛书



专利文献的 相似度计算、分析及应用

Similarity Measurement, Analysis and Applications of
Patent Documents

王秀红 · 著



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内 容 简 介

为了提高专利文献检索的精准率和召回率,本书针对专利文献的内容结构和用词造句特点,建立了专利文献相似度计算的要素组合拓朴结构模型以揭示词项的位置信息;构造了用于计算专利文献相似度的核函数,并通过构建领域专利知识库揭示词项的语义信息。此外,面向中小企业和农业机械工程领域,基于德温特专利数据库和 TI 专利分析工具,通过专利文献检索,提供专利检索分析与专利战略研究一般方法与相关成果。本书可供专利文献检索研究人员、企业技术人员、高校科研人员、企业或政府知识产权决策管理人员阅读、参考。

作者简介

王秀红,女,汉族,系统工程博士,管理科学与工程博士后,高级专利分析师,系统工程及情报学硕士生导师。主要从事分布式信息检索、文本相似度计算、核函数构造、专利文献检索、专利分析与专利战略、专利知识服务等方面的研究。近几年在国内外期刊 SSCI、SCI 和 EI 发表论文共 20 余篇;主持国家自然科学基金、教育部人文社科基金、江苏省社科基金等课题 10 余项;作为第一成果完成人获华东地区科技情报成果一等奖、江苏省科技情报成果奖二等奖。

前 言

专利文献包含大量的技术、经济、法律等信息,是知识产权战略推进中的关键因素。《中华人民共和国专利法》规定,专利文献所阐述的发明内容应该是在国内外出版物上没有公开发表过的,因此,一些最先进、最有价值的发明总是最早在专利文献上公开发表。内容的新颖性使得专利文献成为查找某一领域最新进展的最简便、最迅速的工具。专利文献从日常生活到高尖端技术几乎无所不包,技术领域的广泛性决定了其内容的广泛性。《中华人民共和国专利法》要求专利文献所阐述的发明内容必须紧扣发明的任务,只阐述与发明有关的内容,无关内容少提或不提,从而使得专利文献的信息密度大,针对性和实用性强。专利文献提供了一个丰富的知识宝库,已成为科学技术进步和创新的主要载体。知识产权的获取、创造、运用和管理过程均离不开对相似专利文献的计算机检测。专利文献相似度计算的有效性,即查全率(或召回率)和查准率(或精准率)备受关注,已成为研究的热点。

本书一方面从专利文献的内容结构特点、语言表达特点出发,基于核函数理论,提出新的模型和算法,以进一步提高专利文献检索或相似度计算的精准率和召回率;另一方面,基于专利文献检索,针对农业工程领域的需求,提供专利分析服务。本书可更好地满足在知识产权的获取、创造、运用和管理过程中,对相似专利文献检索的精准率和召回率的需求:①对技术人员而言,通过对专利文献进行相似检索,可借鉴相关研究成果,有效避免重复设计,从而减少研发时间、促进产品创新、降低开发成本;②对发明人或专利代理人而言,可在专利申请前提供准确的最接近现有的相似专利文献,使其在撰写专利申请文献时,独立权利要求的划界更准确,从而提高授权率;③对专利审查员而言,可为其



提供更准确的授权判断依据,减轻审查员繁重的专利审查任务;④对专利分析和专利战略制定人员而言,可为专利分析软件提供更准确、全面的专利聚类,提高专利分析的准确性,使专利分析结果更准确、全面、可靠,有助于制定正确的专利战略。

本书为中华人民共和国教育部人文社会科学研究青年基金项目(项目编号:13YJC870026)、国家自然科学基金青年项目(项目编号:71403107)、中国博士后科学基金第七批特别资助项目(项目编号:2014T70491)、中国博士后科学基金项目(项目编号:2013M541617)、江苏省博士后科学基金项目(项目编号:1302093B)和江苏大学高级专业人才科研启动基金项目(项目编号:14JDG063)的研究成果之一。本书由江苏大学专著出版基金资助出版。

在编写过程中,一些同事、朋友和学生给予了很大帮助,在此表示感谢。我要特别感谢我最好的朋友——我的丈夫对我的支持和鼓励,使我能顺利完成这一项目。

由于时间关系和著者能力水平有限,本书中还存在诸多不足之处,包括研究方法有待进一步提高,实验部分有待进一步完善以与国际接轨,理论研究成果有待进一步投入实际使用,英文描述的准确性、通俗性和专业性等也有待进一步提高。欢迎读者提供宝贵意见至以下电子邮箱:xiuhongwang@ ujs. edu. cn。

著者

2014年12月

Preface

Patent documents contain a number of technical, economic and legal information, and have become the key factor to advance intellectual property strategy. The Patent Law of the People's Republic of China sets that, patent literature describes the contents of an invention that has not yet been published at home and abroad before. Moreover, some of the most advanced and most valuable inventions have always been originally published in patent documents. Patent documents become the most convenient and most rapid tool, for searching the latest technological developments in a particular field, because of the novelty of their contents. The contents of patent documents are all-inclusive from everyday life, to sophisticated technologies. The extensive technical fields of patent documents determine the wide scope of the contents of patent documents. The Patent Law of the People's Republic of China requires that the contents of patent documents be inextricably bound up with the task of invention, and the description focuses only on invention-related content, which makes the information of patent documents dense, pertinent and practical. Patent literature is a treasure house of knowledge and has become the main carrier of science, and technological developments and innovations. The processes of intellectual property acquisition, creation, application and management are inseparable from the patent similarity detection. The validity of the patent document similarity calculation, including the recall ratio and the precision, has become a hot point in this research area.

Based on theories of kernel function, the characteristics of structural contents and language of patent documents, this monograph proposes a new kernel model and algorithm to improve the precision, and recall ratio of patent documents simi-



ilarity computation. Also, by means of patent documents retrieval, this monograph provides patent analysis and patent strategy in the agricultural field and SMEs. This monograph can better meet the requirement of precision, and recall ratio in patent documents similarity computation in the processes of acquisition, creation, application and management of intellectual property. Similar patent documents retrieval has some advantages as explained below: ① With regards to technical staff, they can effectively avoid duplicated design and draw on the experience of relevant research results to decrease development time, promote product innovation and reduce development costs; ② For inventors and patent agents, they can get the closest existing technologies before writing the patent application documents, which makes the delimitation of the independent claims more accurate and increases authorization rates; ③ For patent examiners, they can get accurate judgment based on the authorization and reduce the review burden of patent examination; ④ For patent analyst and patent strategy development officers, they can benefit from more accurate and comprehensive patent clustering analysis to make the patent map analysis results more accurate, comprehensive and reliable, and it helps to develop the right patent strategy.

This monograph was supported by MOE (Ministry of Education of the People's Republic of China) Liberal Arts and Social Sciences Foundation (Grant No. 13YJC870026), National Natural Science Foundation of China (NSFC) (Grant No. 71403107), China Postdoctoral Science the Seventh Special Foundation (Grant No. 2014T70491), China Postdoctoral Science Foundation (Grant No. 2013M541617), Jiangsu Province Postdoctoral Science Foundation (Grant No. 1302093B) and Jiangsu University Research Foundation for Advanced Talents (Grant No. 14JDG063). This monograph was also supported by "Monograph Publishing Fund from Jiangsu University".

Several colleagues, friends and students have helped tremendously in the writing of this text. Mostly, I would like to thank my best friend and husband for the support and encouragement he has made so that I could finish this extended and personally significant project.



Due to constraints such as, limited research time and limited ability of the author, there are still many deficiencies in this book. In detail, these deficiencies include further enhancements of research methods, further improvements of experiments to be in line with international norms and the proposed theory here needs to be put into practical application. The accuracy and popularity of English description also need to be improved. Readers are more than welcome to send comments to the following E-mail address: xiuhongwang@ ujs. edu. cn.

The Author

December, 2014

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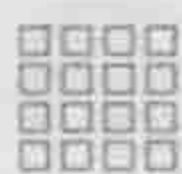
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Chapter 1 Introduction

1.1 Patent

A patent is a property right granted by the government of a country to an inventor, in order to exclude others from making, using, offering for sale, or selling the invention throughout the country or importing the invention into the country for a limited time, in exchange for public disclosure of the invention when the patent is granted. In order to be patentable, the invention must have three elements: utility, novelty and non-obviousness. **Utility**—invention must be useful. The invention must be operable or capable of being used to effect the object proposed, which means it must be useful and functional according to intended purpose. **Novelty**—the invention must be unique and new, which is central to the concept of patents. Compare invention to prior art: it must not have prior publication published anywhere in the world by any person, including the inventor; no public use or sale by any person, including the inventor before filing date. **Non-obviousness**—the invention should just be built on prior invention as a logical extension, which means that the invention is not obvious to anyone involved in the same area as the inventor.

A patent is only in force during its term and its jurisdiction. When the patent term runs out, or if it is abandoned or invalidated in a particular jurisdiction, unless there is a continuation in force, the matter in the patent enters the public domain^[1]. The five patent offices are those who have agreed to a tighter



collaboration in patent prosecution: European Patent Office (EPO), United States Patent and Trademark Office (USPTO), Japan Patent Office (JPO), Korean Intellectual Property Office (KIPO), and State Intellectual Property Office of the People's Republic of China (SIPO). World Intellectual Property Organization (WIPO) is the global forum for intellectual property services, policy, information and cooperation.

1.2 Types and Terms of Patents

The patent laws vary in different countries. Different countries have different types of patents. Most countries that have had different rules in the past are now harmonizing on 20 years from the earliest effective priority date, as per the TRIPS agreement. Some countries have special extensions, e.g. in Brazil there is a minimum term guaranteed, and in USA there can be patent term adjustments associated with delays while the patent application was being examined.

1.2.1 Patents issued in USA

There are three types of patents in USA: utility patent, design patent and plant patent.

Utility Patents Issued in USA

Utility patents are provided for “new and useful process, machine, manufacture, composition of matter or any new and useful improvement of any of the above”. The invention must also be novel, non-obvious, adequately described or enabled (for one of ordinary skill in the art to make and use the invention) and claimed by the inventor in clear and definite terms. If applicant acquires a utility patent, he or she can stop others from making, using, selling and importing the invention. U. S. utility Patent for Apple/Potato Peeler is shown in Figure 1-1.



US006854383B2

(12) **United States Patent**
Wang

(10) Patent No.: **US 6,854,383 B2**
(45) Date of Patent: **Feb. 15, 2005**

(54) **APPLE/POTATO PEELER**

(76) Inventor: **Philip Wang**, 7, Kao Cheng 9th Street,
Tao Yuen (TW)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/811,882**

(22) Filed: **Mar. 30, 2004**

(65) **Prior Publication Data**

US 2004/0261634 A1 Dec. 30, 2004

(30) **Foreign Application Priority Data**

Jun. 25, 2003 (TW) 92211571 U

(51) Int. Cl.⁷ **A23N 3/00**

(52) U.S. Cl. **99/542; 99/595; 99/598;**
99/599

(58) Field of Search 99/515, 539-544,
99/584, 587, 588-599, 623; 426/481-483

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* cited by examiner

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(74) Attorney, Agent, or Firm—Bacon & Thomas PLLC

(57) **ABSTRACT**

An apple/potato peeler. The peeler includes a base, a main frame mounted to a slightly L-shaped structure on the base, a rotatable and axially movable screw horizontally supported on a screw support member on a vertical frame member disposed at the rear of the main frame, a 3-prong fork fixed to the front end of the screw, a guide piece pivotally mounted on the vertical frame member and being releasably engageable relative to a screw channel of the screw, a resiliently movable peeling arm fore-and aft swingeable pivoted to the front part of the horizontal frame member of the main frame, a U-shaped peeling blade fixed to the upper end of the movable peeling arm by a blade positioning device, and a coring/slicing blade fixed to the front end of the horizontal frame member for cutting flesh of a vegetable fruit held by the 3-prong fork if the screw into continuous spiral slices and for coring fruit.

5 Claims, 3 Drawing Sheets

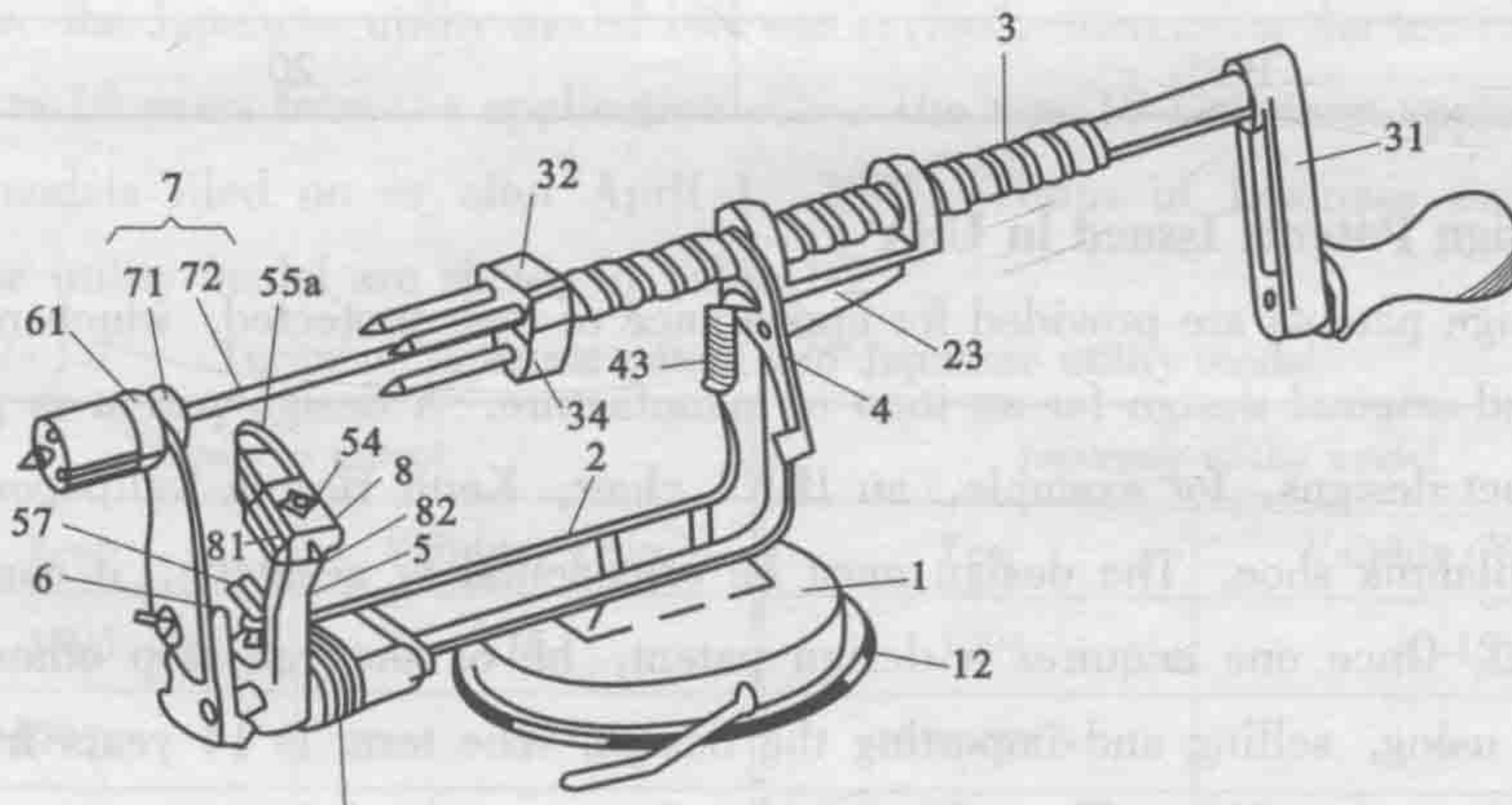


Figure 1-1 U. S. utility patent for Apple/Potato Peeler