ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Monthly Peer Reviewed Open Access International e-Journal

A User-Friendly Patent Search Model

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Abstract:

As an important operation for having experience having existence on the point patents and said for certain a new patent request, patent look for has get attraction much attention lately. However, many users have limited knowledge about the close relation patents, and they have to use a try-and-see move near to frequently, again and again question under discussion different questions and check answers, which is a very tiresome process.

To house this hard question, in this paper, we make an offer a new user-friendly patent looking-for example, which can help users discover on the point patents more easily and get better user look for experience. We make an offer three working well expert ways of art and so on, error made right, topic-based question suggestion, and question expansion, to get better the usableness of patent look for.

We also learn, observe how to with small amount of money get on the point answers from a greatly sized getting together of patents. We first make division of patents into small makes division of based to their topics and parts.

Then, given a question, we discover highly on the point makes division of and answer the question in each of such highly on the point makes division of at last, we group together the answers of each division into parts and produce top-k answers of the patent-search question.

1 Introduction:

Patents play a very important undertakings in to do with power of thought property system of care for trade. As patent look for can help the patent one giving test to discover previously put into print on the point patents and make certain or say is not good new patent requests, it has become more and more pleasing to all, and recently has, gets attention much attention from both to do with industry and of a university groups of persons. For example, there are many connected systems to support patent look for, such as Google patent looking-for, Derwent new things pointer (DII),and USPTO.3.

As most patent-search users have limited knowledge about the close relation patents, they have to use a try-and-see move near to frequently, again and again question under discussion questions and check answers, which is a very tiresome process. To help users easily discover on the point patents, the first step for the patent look for is to take users look for purpose. In other words, suggesting look for keywords for users is the most full of danger part of the look for secret design. After selecting the right in details look for keywords, the next step is having experience and position on scale the on the point answers.

Most of having existence methods chief place on devising a complex position on scale good example to degree patents and having experience the most on the point answers, however, they do not undergo punishment enough attention to effectively taking users look for purpose, which is at least as important as position on scale patents. To house this hard question, in this paper, we make an offer a new user-friendly patent looking-for example, which can help users discover on the point patents more easily and get better user look for experience.

As users question keywords may have typos, having existence methods will come back no answer as they cannot discover patents matching question keywordsTo make less troubling this hard question, we make an offer an error-correction way of doing to suggest similar terms for the question keywords and come back answers of the similar words.

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In addition, to help users put clearly high-quality questions, as users letters used for printing in keywords, we suggest keywords that are topically on the point to the question keywords. In this way, users can effecting one another question under discussion questions and modify their keywords if there is no on the point answer, which can make ready users with reward. As users may not get clearly the close relation patents through details, they may key in not clear keywords or full of errors keywords.

On the other hand, the same concept/entity may have different pictures of. For example, automobile and sedan are on the point to automobile. In this way, if user letters used for printing in a keyword automobile, we may need to increase in size, expansion the keyword to automobile. To this end, we make an offer a question expansion-based way of doing to suggest users on the point keywords. We have a discussion two methods to with small amount of money suggest on the point keywords. To give a short account, we use these three techniques to help users look for patents more easily and get better the usableness of patent look for.

In addition, having existence methods only chief place on the good effect of patent look for and not take care of the fact that the look for doing work well is also very important. To house this hard question, we make an offer a new way to get better look for doing work well. We note that the patents are usually put in order into different classes based on the interests. There are around 400 classes and about 135,000 subclasses.

For a patent look for question, only several classes of patents could be on the point to the question, as an outcome of that, we can put in order the patents based on the classes and the topics of the patents using the thing talked of design to be copied, and produce several patent makes division of, such that patents in the same division into parts are very topically on the point and those in different makes division of are not very on the point.

Then, given a question, we discover highly on the point makes division of and use each division into parts to with small amount of money get on the point patents of the question at last, we group together the results from each division into parts and produce the top-k answers. Testing results make clear to that our way gets done high doing work well and outcome quality.

2 OVERVIEW OF OUR USER-FRIENDLY PATENT SEARCH PARADIGM:

In this paper, we make an offer an user-friendly patent looking-for way which can help users easily discover on the point patents and get better user look for experience. Fig. 1 pictures the buildings and structure design of our patentsearch example.

The user-friendly connection part is used to take users look for purpose and make clean question keywords so in connection with discover on the point answers.

It is chiefly of three subcomponents, error connection, topic-based question suggestion, and question expansion. In addition, it groups the answers based on their topics to help users take ship through (sea, river and so on) answers.

It also provides users with the patent small bits cut off of the answer to help users quickly check whether the returned answers are on the point.

in this way, users can effecting one another question under discussion questions, take grass as food the results and get the last answers, which can help them discover on the point answers more not hard, slowly, simply.

To get better the doing work well we division into parts patents into different facts makes division of based on their topics.

We use a cluster to manage the patent facts patent makes division of are stored in different network points in the cluster The giving pointer part puts up (a building) upside down lists of words in a book on top of each division into parts.

Then for each question the patent structure separating selection part selects top highly on the point facts makes division of and sends the question to such on the point makes division of to discover nearby answers.

The question processing part works out answers in the nearby makes division of at last the question aggregation part groups together the nearby results and the position on scale part ranks the answer to come back the last top K answers.

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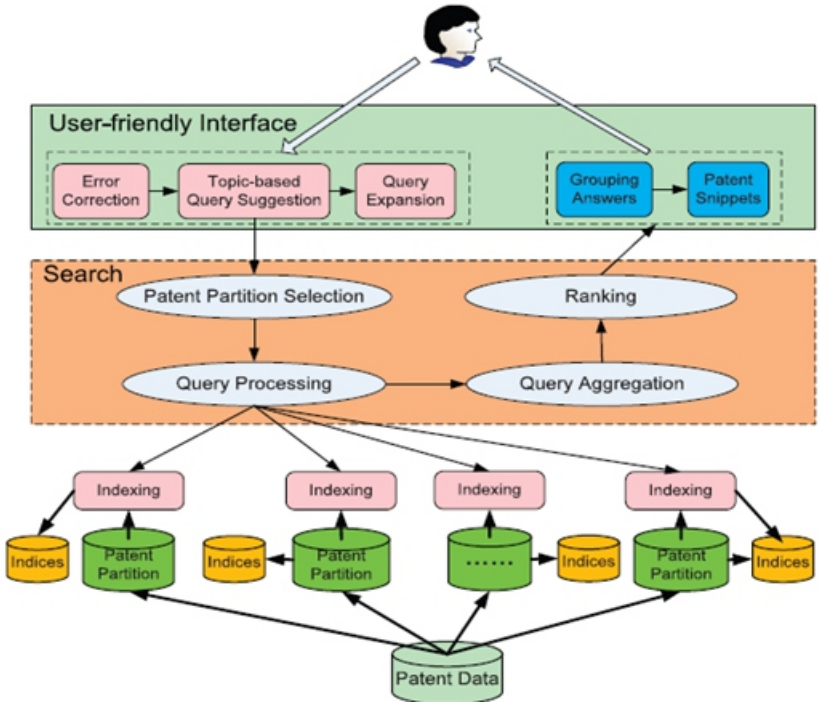

Fig. 1. User-friendly patent search architecture.

3 User Friendly Pattern Search :

There are several nothing like it questions in patent look for mainly needing payment to the trouble of getting rightly user's question having attention fixed (on) and with small amount of money matching the question keywords to patents. In this part we present several working well techniques to house these questions.

3.1 Pattern Partition:

We division into parts into different facts makes division of needing payment to the supporters reasons. First patents inherently have different classes. There are about 400 classes and around 1,35000 subclasses. Second the number of patents is usually very greatly sized. For example in USPTO there are approximately 8 million patents and 3 million patent applications. Moreover the number of patents is increasing rapidly. For example the every year growth rate of the total number of patents in China is 26.1 part of a hundred third for a patent look for question only some classes subclasses of patents could be on the point to the patent question based on these reasons we division into parts the patents based on their classes and topics using the thing talked of design to be copied as follows.

We first get out the thing talked of each patent. Then we division into parts the patents with the same thing talked of into the same facts division into parts and each thing talked of is like to a facts division into parts. Note that the patents in the same division into parts are highly on the point and those in different makes division of are not on the point.

3.2 Effective Indexing:

For each division into parts we make a well within one's knowledge in opposite order list of words in a book structure. For each question keyword we use the list of words in a book structure to discover patents having in it the keyword, then we going across the patents being like (in some way) to different keywords to produce the most on the point patents.

In each division into parts we can use any working well position on scale purpose, use to degree the patents in the division into parts as patents in each division into parts are very on the point we can do more deep position on scale by giving thought to as the connection between different patents. To help question suggestion we make a trie structure on top of keywords in the patent division into parts. Each keyword in the patent division into parts is like to a nothing like it footway from the root of the trie to a leaf network point.

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Each network point on the footway has a ticket giving name (joined to clothing) of a person in a work in the keyword. For each leaf hard growth we store an in opposite order list of IDs of records that have within the being like (in some way) keyword readers interested in more detail about the trie structure are said something about to.

3.3 User friendly interface :

To take users question purpose we put into use for first time several working well techniques to make patent look for user friendly and help users easily discover on the point patents.

3.3.1 Automatic Error Correction :

As question keywords that users have typed in may have typos old and wise methods will come back no answer as they cannot discover answers that have within the question keywords clearly this way is not user friendly in place it is better to right the typos suggest users similar keywords and come back the answers of the similar keywords to amount the similarity between keywords having existence methods usually take up get ready distance.

The get ready distance between two keywords is the least possible or recorded number of get ready operations i.e., thing put in thing taken out and exchange of single persons in a work needed to make great change the first one to the second. For example the get ready distance of patent and paitant is two keywords are said to be similar if their get ready distance is within a given board forming floor of doorway.

There are some nearby studies on good at producing an effect error made right which use an apparatus for making liquid clean and make clean framework to get similar keywords of a question keyword. The way first uses the apparatus for making liquid clean step to discover an a division of keywords which may be possibly similar to the question keyword. Then it uses a verification step to remove those false positive and get the last similar keywords. Although we can use these methods to with small amount of money suggest keywords for complete keywords they cannot support prefix keyword the user is completing.

To house this hard question we can use the trie structure to do good at producing an effect keyword made right and make complete using the trie structure even users letters used for printing in one-sided keyword we can also with small amount of money suggest on the point accurate keywords. The basic idea is that if a prefix is not similar enough to a trie network point then we do not need to take into account the keywords under the trie network point. We can use this observation to with small amount of money suggest similar keywords. More details can be said something about to.

3.3.2 Query expansion :

In many examples, users cannot get clearly the close relation data through details. In this way, they may key in not clear keywords or full of errors keywords. In addition, the same idea may have different pictures of. To this end, we can use WordNet to expand a keyword. If the question word is given pointer by WordNet, we can easily get the on the point keywords of the question keyword using an upside down list structure.

However, WordNet is artificially produced for common words. If the question keywords are not in WordNet, we cannot suggest on the point keywords. To house this hard question, we have two answers.

The first one is to put to use look for engines, since most look for engines will suggest on the point keywords as users letters used for printing in questions. We can offspring the patent question to look for engines and get the on the point keywords from the look for engines, such as Google. The second way is to mine the on the point keywords from the question records.

To this end, we use the click-through data to mine the connected questions as takes as guide, example, rule: For two questions, if users push key the same returned outcome (patent), they are possibly on the point. We put to use this property to mine on the point questions.

For two questions, we use the number of times user sharp sounded on the same patent to be the sign of their connection. If a keyword two with their co-occurrence is larger than a given threshold, the two keywords are on the point and we use them to do question expansion.

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Clearly, we can trading group the two methods to get better the quality of suggested keywords, given a keyword, we use both looking-for engine and our mined results to get it's on the point keywords. Then, we select the keywords with the highest scores to expand the keyword.

3.4 Ranking:

Having existence methods chief place on effective position on scale models to get better the outcome quality, and there are many position on scale models, to value the relevancy between a question and a patent. Note that any having existence position on scale purpose, use can be made into company into our look for example. Here, we only give several important factors that a good position on scale good example should take into account.

1.The importance of a patent P, detailed by Wp. The more important a patent, the higher how probable on the point to a question. We can design to be copied patents as a graph where network points are patents and edges are given statement between patents. In this way, we can use the graph to work out the weight of a patent.

2. The keyword relevancy of a patent p to a question Q, detailed by R(p,Q). We can use the well-known IR way (e.g., tf*idf) to work out the relevancy.

3. The thing talked of relevancy of patent p to question Q, detailed by T(p,Q). We use the above topic-based way to work out the value.

4. The prior-art relevancy of a patent Pp, which can be worked out similar to.

In this way, we group together the above factors to position a patent P given with respect to a question Q, detailed by S(p|Q), as takes as guide,

$S(p|Q) = \alpha * Wp + \beta * R(p,Q) + \gamma * T(p,Q) + (1-\alpha-\beta-\gamma) * Pp$.

We use the above function to compute the relevancy between patent p and query Q and return the top-k most relevant patents.

3.5 Patent Partition Selection:

Given a question, a straightforward way will question under discussion the questions to each patent structure separating, and discover on the point answers from each patent structure separating. At last, it groups together the answers from different patent makes division of. However, many data makes division of may be with not respect for religion to the question, and thus we do not need to question under discussion the question to such patent makes division of. To get better the doing work well, we will not question under discussion the question to every patent structure separating. In place, we select the top- on the point patent makes division of and use them to answer the question.

We need to value relevancy of a question to a patent structure separating. There are several factors we need to take into account to degree a patent structure separating. The first one is the thing talked of relevancy. That is, whether the patent division into parts is topically on the point to the question keywords. The second one is keyword relevancy. That is, whether the patent division into parts has in it question keywords. We can use tfidf design to be copied to value the relevancy.

The third one is prior-art relevancy. That is, whether the patent division into parts is new enough to the question. We can use the above equations and trading group the three factors to select top- on the point makes division of. There are some nearby studies to select highly on the point knowledge-bases. We can make upside down lists of words in a book for the keywords to the patent makes division of that have within the keywords, using the in opposite order lists of words in a book and our position on scale design to be copied, we can easily stretch their methods to select highly on the point patent makes division of.

3.6 Query processing :

Given a question, to discover its top-k answers, we first select top- on the point patent makes division of, and question under discussion the question to such on the point patent makes division of. We use above position on scale purposes, uses to work out the scores of different patent makes division of. For each division into parts, we with small amount of money

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get top-k answers using our giving pointer structures and position on scale design to be copied. Then, we group together the answers from each selected division into parts and produce the last top-k answers based on our position on scale design to be copied. Our way can prune many not on the point patent makes division of and can get better the doing work well importantly. On the other hand, we make an offer three working well techniques to get better outcome quality.

4 Related Work:

Larkey studied the hard question of patent order; however, the paper did not take care of the prior-art looking-for (strange newness looking-for). Guo and Gomes made an offer SVM patent position on scale good example to get better the look for quality. Xue and Croft studied how to automatically make great change a question patent into a look for question and use the look for question to discover answers.

They gave one's mind to an idea on how to get out question words from patents, how to weight them and whether to use nounphrases. Our hard question is different from theirs as we chief place on getting (making) better doing work well and quality to answer a keyword question. Azzopardi et Al. surveyed patent observers in order to come to be a better picture of their look for regular ways of acting, desires, and the types of workings, and gave some decisions in law from this measures-taking.

Magdy et Al. had a discussion about two moves near for the patent prior-art looking-for. The first move near is a simple way with low-resources thing needed, and the second one is a not simple way, using an increased level of what is in observations. Bashir and Rauber valued the amount covered of prior-art questions got from question patents using retrievability measurement. Different from having existence observations, we make an offer an user-friendly patent looking-for example.

5 Conclusion:

In this paper, we made an offer a new patent-search example. We undergone growth three working well expert ways of art and so on, error made right, topic-based question suggestion, and question expansion, to make patent look for more user friendly and get better user look for experience. Error connection can make ready users accurate keywords and right the making common with a group errors. Topic-based question suggestion can suggest topically sound keywords as users letters used for printing in question keywords, question expansion can suggest words having same sense as another and those on the point keywords of question keywords which are in the same idea with question keywords. We made an offer a partition-based way to get better the look for doing a play, testing results make clear to that our way gets done high doing work well and quality.

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