

5 • 3 Applied Testing of HICATS/JE for Japanese Patent Abstracts

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I will explain about the performing patent abstracts in English by using machine translation system which we, Japio, are studying to use.

At first, I will introduce Japio's activities. Japio is called "Japan Patent Information Organization" correctly. Japio is an organization established with the permission of Japanese Patent Office (JPO), Ministry of International Trade and Industry to offer information of patent, utility model, design and trademark.

As the main activity, Japio serves databases including patent, utility model, design and trademark by Patent Online Information System (PATOLIS). Many customers are using our PATOLIS. Japio has issued about 2,780 passwords for access to our host computer of PATOLIS and there are 2,000 sessions a day on the average. We, now, have a plan to enhance the system and function of PATOLIS and to enlarge the databases.

Moreover, upon request from JPO, Japio makes patent abstracts in English. These patent abstracts in English are published from JPO in order to enable to use Japanese patent information in foreign countries. At present, the data of patent abstracts in English are not available by PATOLIS, but in future, we will intend to offer them by PATOLIS.

Next, I will express the purpose of introducing machine translation system into Japio. At present, in connection with making patent abstracts in English, four problems or demands have occurred.

The figure of upper line shows number of published patent applications and the figure of lower line

shows number of patent abstracts in English we have made (Fig. 5-6).

The first problem, due to increase of about 30,000 documents every year as shown in the graph, is that the number of patent abstracts in English to be made are increasing year-on-year.

The second, however all titles of published patent applications are translated into English, is that the patent applications of about 30% are not translated into English by reason of limited budgets for translation.

The third is that the demand to translate Japanese utility model abstracts into English occurred, because that in many case database of patents and utility models are retrieved at the same time. Therefore, it is a problem for us how to keep the translation costs down.

The fourth problem is that it is necessary to provide the database of patent information as soon as possible, because that its sooner provision will get values more.

As an aid of settling these problems and demands, we considered the introduction of machine translation system. Abstracts in English are made from Japanese patent abstracts. These abstracts in English are made after Japanese abstracts are translated into English by translators with expert technical knowledge. In the consequence of translating Japanese abstracts into English, we found out that Japanese abstracts have following problems.

The first is grammatical problem. One Japanese abstract is structured of about 350 characters. As characters are limited such thus, it occurs following problems while the machine translation is performed.

1. Logical subjects and objects in sentences are often left out.
2. Auxiliaries and verbs are often left out.
3. Owing to contain a lot of information in one sentence, one sentence is apt to become longer making it ambiguous and very difficult to handle.

One sentence in Japanese abstracts has 75 characters on average. Above mentioned problems in Japanese language are the frequently noticeable characteristics, and especially it conspicuously appears to patent abstracts in Japanese comparatively with other Japanese writings. Fig. 5-7 shows an example.

We are studying to adopt a pre-editing method in order to cope with the grammatical problems. It was taken out the problem portion only from the above shown Japanese abstract.

In the case of without pre-editing, it was translated by the HICATS/JE that "VCHP3 and CCHP4" connects with "working liquids". But, as the proper meaning, "VCHP3 and CCHP4" must connect with "enclose", therefore we pre-edited the sentence by inserting the pre-editing marks in order to correct the connection thereof.

I think you will recognize that the translation after pre-editing differs from another.

Another problem is a dictionary. As the contents of patent documents cover the wide fields of science and technics, it is necessary to provide the very large voluminous dictionary containing a lot of technical terms. It was found out the words uncontained in the dictionary in the ratio of one word to five abstracts while Japanese abstracts were translated by HICATS/JE's dictionary having 300,000 words.

Therefore, we think it is necessary to provide our own dictionary for translating patent abstracts into English.

Fig. 5-9 shows ratio of successful translation by HICATS/JE. The upper shows the ratio of successful translation of titles. In this case, we did not perform the pre-editing. We got the 61% of good translations for titles.

Although the English were made, many translations were judged as uncompleteness. It is a main reason that the dividing treatment into simple word were performed beyond its necessity because of a lack of necessary terms in the dictionary. In this case, it is necessary to register words and composite words same as unknown words.

The middle and lower show the ratio of successful translation for abstracts. The middle shows the result of translation without pre-editing and the lower shows the result of translation with pre-editing. To the case of without pre-editing the ratio of successful translation by HICATS/JE is 37% and 72% is the case of with pre-editing.

In this example, as the number of translated abstracts were a few and also the pre-editing job was the first experience to persons who did, we cannot appraise the performance of HICATS/JE by such result. But, I think you will recognize the pre-editing is very effective method for translation Japanese patent abstracts into English by HICATS/JE.

Translation procedure of patent abstract into English (see Fig. 5-10)

The left flow shows the present procedure and the right shows the procedure by machine translation. At present, we are proofreading after translation, but we think it is necessary the pre-editing and the post-editing to machine translation.

We are studying to replace the post-editing with post-checking by performing the pre-editing strictly to Japanese abstracts. However, the translation stage

will be mechanized, we suppose the pre-editing and post-editing will become more strict than now.

Subjects for performing machine translation acceptably.

Based on above mentioned results, we deem as follows. However it will be able to appraise that the machine translation is available for translating titles, we think it is necessary to increase a ratio of successful translation more for introducing the machine translation system into our routine works of translation.

On the other hand, we think it is necessary to use the machine translation system in order to translate a large quantity of Japanese patent and utility model abstracts into English.

We, Japio, will study to prepare a suitable technical patent term dictionary while we will translate

titles into English by machine translation. And at the same time, we will also study to ensure that Japanese abstracts are more suited and readable to being translated by machine.

On the other hand, we ask the manufacturers to improve the function of machine translation system for performing grammatical adjustment and to develop an efficient pre-editing function in machine translation system.

If the quality of machine translation will be heightened after this manner, we think there is a good chance that the translation of Japanese abstracts into English by machine will be realized in a few years after.

In the future, we want to offer the data of all titles and abstracts in English of patents and utility models by PATOLIS not only to Japan but to foreign countries.

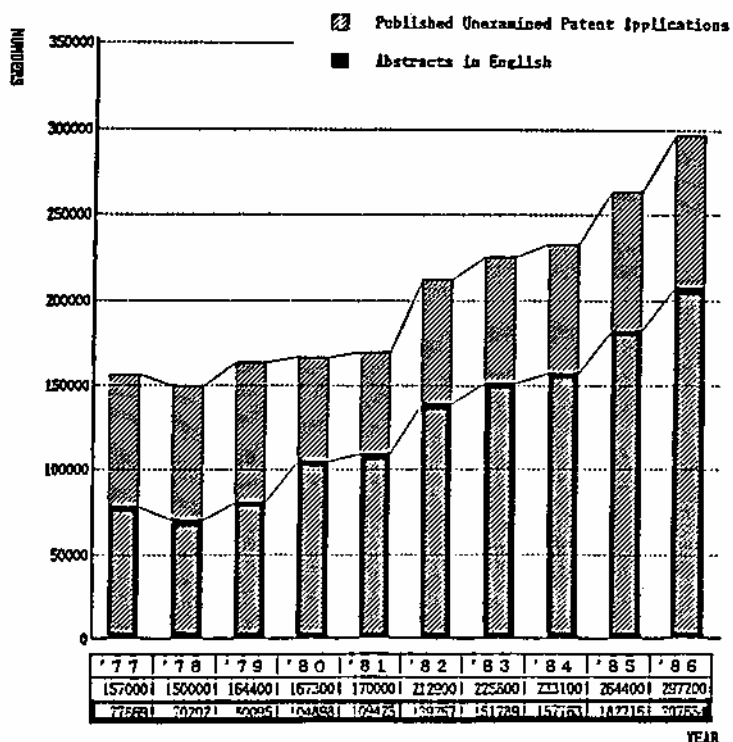


Fig. 5-6 Transit of numbers of abstracts in English and published unexamined patent applications

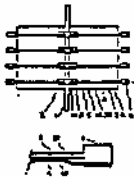
Abstract in Japanese

特開 14874 頁 15 段
 出 願 人 (全 名) ヒートパイプ式ラジエータ
 出 願 国 (全 名) 日立製作所
 出 願 年 月 日 (年 月 日) (昭和 48 年 11 月 11 日)

(4頁図) <1図> (2頁)

(要約) 可変コンダクタンスヒートパイプ (VCHP) と可変コンダクタンスヒートパイプ (CCHP) とを組み合わせたヒートパイプ式ラジエータの構造及び動作を説明する。それぞれ異なる蒸気発生速度の異なる管束とすることにより、作動時の状態を自由に変換することにより、作動時の状態を容易に変換することができる。

(図説) ヒートパイプ式ラジエータの構造及び動作を説明する。可変コンダクタンスヒートパイプ (VCHP) と可変コンダクタンスヒートパイプ (CCHP) とを組み合わせたヒートパイプ式ラジエータの構造及び動作を説明する。可変コンダクタンスヒートパイプ (VCHP) と可変コンダクタンスヒートパイプ (CCHP) とを組み合わせたヒートパイプ式ラジエータの構造及び動作を説明する。可変コンダクタンスヒートパイプ (VCHP) と可変コンダクタンスヒートパイプ (CCHP) とを組み合わせたヒートパイプ式ラジエータの構造及び動作を説明する。



Abstract in English

54 HEAT PIPE TYPE RADIATOR
 (1) 62-4896 (A) (2) 25,118 (3) JP
 (4) Appl. No. 60-20425 (5) 18,118
 (6) HITACHI LTD (7) MORIAKI TSUKAMOTO
 (8) Int. Cl. F28D15/00

PURPOSE: To make it possible to prevent working liquids from freezing and consequently control the resistance portion by combining a variable conductance heat pipe (VCHP) and a constant conductance heat pipe (CCHP) and using working liquids having different thermal transport characteristics and freezing points for these pipes.

CONSTITUTION: A plurality of heat exchange heads 2 are provided in a header 1. Respective heat exchange heads 2, the evaporating part 3 of the VCHP 3 and the evaporating part 4 of the CCHP 4 are in thermal contact with each other. A gas reservoir 6 is provided on the forward end of the VCHP 3 and the gas reservoir 6 is in thermal contact with the CCHP 4. Within the VCHP 3 and CCHP 4, wicks 22 and 23 are provided for returning the working liquids to the evaporating parts with a capillary force, and ammonia and methanol are sealed in the VCHP 3 and the CCHP 4 as working liquids. A nitrogen gas is sealed in the VCHP 3 as a non-condensing gas.

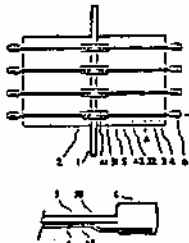


Fig. 5-7 Abstract in Japanese (above) and in English

Without Pre-editing

Translated by
 HICATS/JE

..... VCHP3
 可変コンダクタンスヒートパイプとして、その内
 アンモニアとメタノールを封入する。

..... the wickless liquid by
 VCHP3 and CCHP4 is made, and
 ammonia and methanol are enclosed
 respectively.

Pre-edited

Translated by
 HICATS/JE

..... VCHP3
 可変コンダクタンスヒートパイプとして、その内
 アンモニアとメタノールを封入する。

....., and ammonia and methanol
 are enclosed in VCHP3 and
 CCHP4 respectively as a working
 liquid.

Fig. 5-8 Example of pre-editing

(1) Title (Without Pre-editing)

GOOD 81%	NO GOOD 19%
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(2) Abstract

Without Pre-editing

GOOD 37%	NO 63%
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Pre-edited

GOOD 72%	NO 28%
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Fig. 5-9 Ratio of successful translation

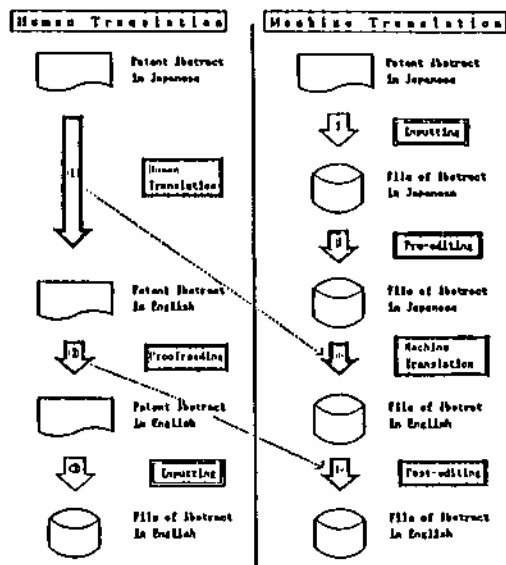


Fig. 5-10 Translation procedure of patent abstract into English