Specification Maker for
Design Standard (SIMDES)

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Since software and hardware of information processing products such as mobile computer are designed by standards and specifications and the like. In scripting specifications, it is very time-consuming and special skill must be held by designers. To solve theses problems, SIMDES (Specification Maker for Design Standard) is proposed to deliver technical terms depending on product's design process and product's size scale from host dictionary on the server. As result, appropriate technical term deliberations are possible to designers. And development cost can be reduced.

1. Introduction

Specifications with the terms can be accepted in terms of hardware and software process scale[1] and the product size scale. When the appointment field decided from a product field consisting of the products scale that accepted the size that the process scale that accepted duties process becoming the object and the product that it is it occupied between the key by one process scale and one product scale of specifications is appointed as for vocabulary choice, vocabulary which is the aggregate of a term used for specifications chooses appointment vocabulary touched correspondence in the appointment field by memorized vocabulary. When letter input operation to make specifications was performed, term extraction means extracts term corresponding to the letter input operation from designated vocabulary and shows term which are extracted as candidate character string. These terms are also used in standards or specifications' deliberations[2]. Detailed Description are as follows.

1.1 Applied Field
This paper describes the specifications creation support program and specifications creation

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support equipment which support creation of the specifications about a predetermined product.

1.2 Background of engineering
This paper is about the specifications creation support program and specifications creation support equipment which support creation of the specifications about a predetermined product. Fig. 1 shows the management method of the proposed specifications. As shown in Fig. 1, a specifications document manages the drawn-up specifications. It matches with the specification number given to specifications, and the operating process and the name are set to the specifications document as shown in Fig.2. An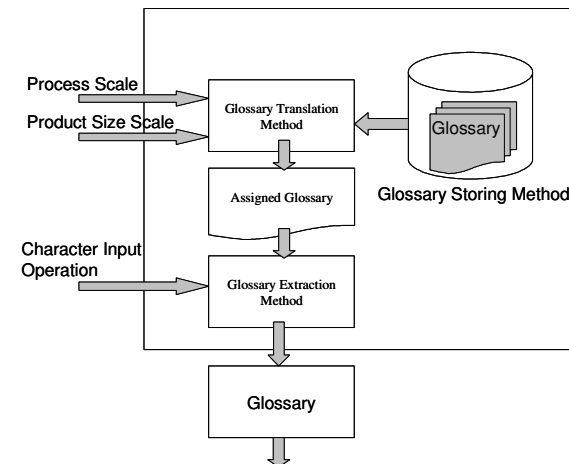d when desired specifications are searched at time to make specifications, identified specifications number of desired specifications from duties process and a name are set by specifications document and picked desired specifications from specifications number. Great labor was necessary for the making of specifications in this way, therefore specifications making support device is suggested to make specifications efficiently.

Fig. 1 Schematic view of proposed specification's maker

1.3 The issue which this paper tends to solve
However, since specifications are drawn up in many cases when the developers of each of a product investigate using a dictionary, and they draw up specifications using the words and phrases to which a developer is used, it is common for the term written in specifications to be various by a developer as shared by designers, manufacturers and so forth in the field[3]. . Moreover, the dictionary for investigating a term has many expensive things. Therefore, there

was also a problem that the cost concerning product development will increase. Moreover specifications were not drawn up in consideration of the process scale accordingly. were not drawn up in consideration of the process scale according to the operating process of the product developed at the time of creation of specifications, the product scale according to the size of the product, etc.
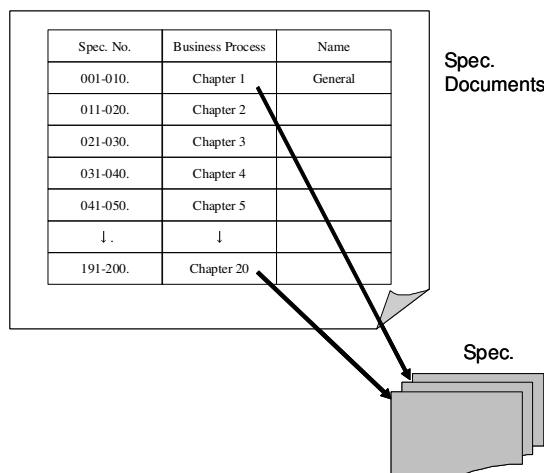
Spec. No.	Business Process	Name
001-010.	Chapter 1	General
011-020.	Chapter 2	
021-030.	Chapter 3	
031-040.	Chapter 4	
041-050.	Chapter 5	
↓.	↓	
191-200.	Chapter 20	

Spec.
Documents

Spec.

Fig.2 Business Process and Specifications

Therefore, there was also a problem that the process scale of a product, a product scale, and the term that does not necessarily conform will be written in specifications. Moreover, since it became less clear whether I may use and search any term when investigating whether there are already any specifications similar to the specifications which the developer of a following product etc. is going to draw up, there was a problem of the information retrieval noise of being hard to discover desired specifications. This paper is made in view of such a point, and it aims at offering the specifications creation support program which can draw up specifications using the term according to the product process, product scale and specifications creation support equipment.

2. The means for solving a subject

In this paper, in order to solve the problem, the specifications creation support program which supports creation of the specifications about a predetermined product as shown in Fig. 1 is offered. Based on this specifications creation support program, the processing capability shown in Fig. 1 in a computer is realized. Namely, the process scale according to the operating process which is the target of specifications, The process scale out of the product field where the target product consists of product scale scales according to the size (capacity, such as a case and a package) which occupies space, If the appointed field determined from the product scale is specified From a glossary memory means by which the glossary which is

an aggregate of the term used for specifications is memorized When character input operation for drawing up the glossary selection means and specifications which choose the specification glossary matched with the appointed field is performed The specifications creation support program characterized by extracting the term corresponding to character input operation from the specification glossary , and operating the extracted term as a term extraction means to show as a character string candidate is offered.

The process scale according to the operating process from which glossary selection means set as the object of specifications by this, The process scale out of the product field where the target product consists of product scale scales according to the size which occupies space, Specification of the appointed field determined from the product scale chooses specification glossary matched with the appointed field from glossary memory means the glossary which is the aggregate of the term used for specifications is remembered to be. When character input operation for drawing up specifications is performed, from specification glossary, term extraction means extracts the term corresponding to character input operation, and presents the extracted term as a character string candidate.

Moreover, in this paper, it sets to the specifications creation support equipment which supports creation of the specifications about a predetermined product. The glossary memory means memorized by the glossary which is an aggregate of the term used for the specifications relating with the product field pinpointed from the process scale according to the operating process which is the target of the specifications, and the product scale according to the size in which the target product occupies space, If the appointed field is pinpointed out of the product field by specifying the process scale, and the product scale. When character input operation a glossary selection means to choose the specification glossary matched with the appointed field, and for drawing up the specifications is performed The specifications creation support equipment characterized by having a term extraction means to extract the term corresponding to the character input operation from the specification glossary, and to show the term which extracted as a character string candidate is offered.

It relates with the product field pinpointed from the process scale according to the operating process from which the glossary whose glossary memory means is an aggregate of the term used for specifications is the target of specifications by this, and the product scale according to the size in which the target product occupies space, and memorizes. A glossary selection means will choose the specification glossary matched with the appointed field, if the appointed field is pinpointed by specifying the process scale of 1, and the product scale out of the product field. When character input operation for a term extraction means to draw up specifications is performed, the term corresponding to character input operation is extracted

from a specification glossary, and the extracted term is shown as a character string candidate.

3. Proposed methods
3.1 Principle of proposed first method

Since the term corresponding to the character input operation for drawing up specifications is extracted out of the specification glossary matched with the appointed field according to the specifications creation support program of this paper, and specifications creation support equipment It becomes possible to draw up specifications using the term according to the process scale and product scale of the product. Term constituting the part of specifications when term 3 which I showed as candidate conversion is chosen among a user.
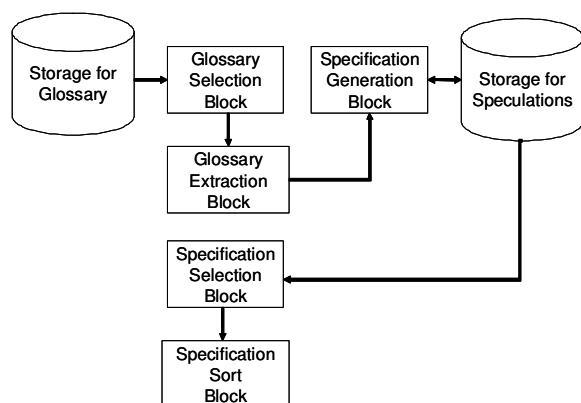

Fig. 3 Diagram of new system

Fig. 3 shows the processing capability of a terminal unit. The terminal unit is equipped with a glossary memory part, a specifications memory part, a glossary selection part, the term extraction part, the specifications creation part, the specifications selection part, and the specifications sorting part as shown in Fig. 3.

The glossary with which the term used for specifications, the definition, etc. are memorized relates with the product field pinpointed from the process scale according to the operating process of the product which is the target of specifications, and the product scale   according to the size of the product, and is memorized by the glossary memory part.

Specifications connect the specifications memory department with the product field of a product becoming the object of specifications, and it is memorized. When a designated field is appointed by a user when I make specifications, the vocabulary choice department chooses a vocabulary (called the following, "the designated" vocabulary) connected with the appointment field from a vocabulary memorized in vocabulary memory region and acquires it.

The term extraction department accepts letter input operation to make specifications by the user and extracts a term from the appointment vocabulary which vocabulary choice department acquired and it is based on letter input operation and sorts the term which I extracted and shows it through monitors for a user.

When there is a new making demand of specifications from a user, I begin to read a model of specifications, and specifications making department starts making processing of specifications. And I perform temporary registration to specifications making when the term which term extraction department showed is chosen by a user.

In addition, I search it when I receive instructions of the effect correspondence can stick to coping product Field, and to register specifications making from a user with specifications memory region whether there are not specifications of contents same as specifications making in specifications memory region.

When there were not specifications of the same contents, I register specifications making and do not register specifications making when there were specifications of the same contents.

In addition, judgment whether there are any specifications of the same contents For example, the specifications which match with the appointed field and are beforehand memorized by the specifications memory part 120 WORD matching of the specifications (it is hereafter called "registration specifications") and in preparation is carried out, and when there are registration specifications which have the degree of similar more than fixed to specifications in preparation, it is judged that there are specifications of the same contents.

Moreover, if a specifications creation part has overwrite creation directions of specifications from a user, it will acquire the specifications which perform overwrite creation from a specifications memory part. And temporary registration is performed to the specifications acquired when the term which the term extraction part presented was chosen. Moreover, if registration directions are received from a user, it will be searched whether there are specifications in preparation and specifications of the same contents in a specifications memory part. When there are no specifications of the same contents, specifications in preparation are registered, and when there are specifications of the same contents, specifications in preparation are not registered.

Specifications choice department of a process scale and a product scale when receive either and a search query including a search term from a user at least; from a search query of a process scale and a product scale at least begin to read one.

And I acquire all specifications (called the following, "designated" specifications) which I connect it with a process scale including in a search query and 1 or the plural appointment fields identified by a product scale e, and is memorized from specifications memory region.

Specifications sort by department are based on a term set the word appearance frequency of all designated specifications which 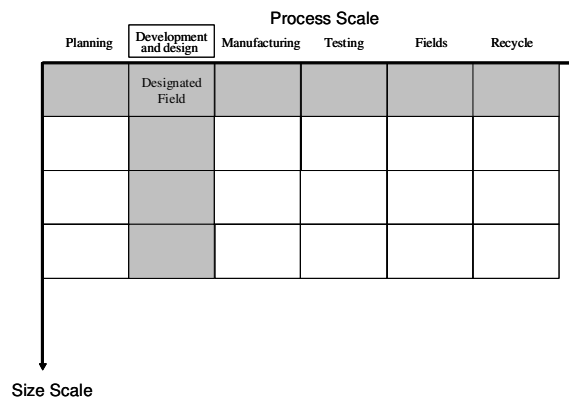specifications choice department   acquired by a search query and accepts the investigation, words appearance frequency and does a heaviness charge account in appointment specifications document specifications. And designated specifications are based on heaviness and displayed it with the turn of the sort result.

On the other hand, there is a case including the link so that designated specifications

Process Scale

Planning	Development and design	Manufacturing	Testing	Fields	Recycle
	Designated Field				

Size Scale

Fig.4 Process scale and size scale

do quotation of other specifications. In that case, the word appearance frequency of specifications (called the following, "direct" specifications) of the link future accepts the investigation, the word appearance frequency that examined based on a term set by a search query and does a heaviness charge account in specifications. In addition, a product field and direct specifications added correspondence to designated specifications perform a heaviness charge account by the estrangement degree of a correspondence touched product field. And it is decided with the heaviness of each specifications for the cause by a heaviness charge account by the word appearance frequency and a heaviness charge account by the estrangement degree of each product field. And I sort specifications based on the heaviness and display it with the turn of the sort result.

In addition, there is a case including the link so that direct specifications do the quotation of other specifications more.

In that case, the word appearance frequency of specifications (called the following, "indirect" specifications) of the link future accepts the investigation, the word appearance frequency that I examined based on a term set by a search query and does a heaviness charge account in specifications.

In addition, a product field and indirect specifications added correspondence to designated specifications perform a heaviness charge account by the estrangement degree of a correspondence touched product field. And it is decided with the heaviness of each specifications for the cause by a heaviness charge account by the word appearance frequency and a heaviness charge account by the estrangement degree of each product field.

And I sort specifications based on the heaviness and display it with the turn of the sort result.

In addition, and, in the specifications sort department, specifications calculate the estrangement degree of the product field by the difference of each value of a process scale corresponding to the product field touched correspondence and the product scale a process scale corresponding to the product field added correspondence to direct specifications and a product scale directly.

Moreover, the process scale and product scale   corresponding to the product field where specifications are matched directly as for the specifications sorting part, And the degree of deviation of the product field is computed according to the difference of each value of the process scale corresponding to the product field where indirect specifications are matched, and a product scale .

The appointment field is appointed when specifications next.   Figure 4 shows a product field consisting of a process scale and a size scale. A process scale is set by the cross axle to show it in figure 4, and a product scale   is set in a vertical axis. For a process scale, six phases of scales of a plan / development / design and fabrication / an examination / a field / the collection are set in order of the duties process of a product becoming the object of specifications from the left to the right. For a product scale, four phases of scales of server PC mobile / the LSI are set in the big order of the scale of the product from the top to the bottom. 24 product fields consist of it by this process scale and a product scale .

I appoint the development / design of the process scale and the server of the product scale then it is a thing about the development / design stage for duties process and when, for example, the specifications which I am going to make are the products of the server class for a product scale.

Then four product fields where the slanted line that a process scale was subtracted from the top right corner added correspondence to as a development / design in the lower left was run

over are identified. In addition, six product fields where the slanted line that a product scale was subtracted from leaning to the left added correspondence to as a server in the lower right was pulled are identified. And the product field of four product fields falling under a development / design and the one falling under both among six product fields falling under the server of the product scale   of the process scales is identified as an appointment field.

I explain the concrete example of data stored next by a terminal.

Figure 5 shows the data structure example of the vocabulary. A name, candidate conversion, a meaning, English meaning and each column of the choice number of times are established in the vocabulary to show it in figure 5. An information fellow displayed in the cross direction of each column is connected each other and constitutes a record about a term used for the specifications which a vocabulary connects it with the connected product field, and is memorized.

Name	Conversion Req.	Meaning.	Meaning.	Name
Module	MPU	・・・・・・	・・・・・・	3
Module	CPU	・・・・・・	・・・・・・	5
Unit	cm	・・・・・・	・・・・・・	10
Unit	m	・・・・・・	・・・・・・	3
・・・	・・・	・・・	・・・	・・・

The name of a term input by letter input operation to be considered to be it when specifications in the column of the name is set. In the column of the candidate conversion, candidate conversion when

Fig.5   data structure example of the vocabulary

the name of a term is converted by letter input operation is set. In the column of the meaning, the meaning of a term input by letter input operation is set. In the column of the English meaning, the English meaning of a term input by letter input operation is set. The number of times that was chosen when the name of a term input is converted by letter input operation in the column of the setting number of times is set.

a development / design for an   process scale is appointed, and the vocabulary shows a vocabulary touched correspondence in the designated field which is pinpointed when a server for a product scale is appointed.

For example, that there is "MPU" as candidate conversion as candidate conversion is set when it was input "MPU" and a letter when specifications in the first record is scripted . In addition, it is set by displaying a meaning and the English meaning set by each column of meaning and

the English meaning when candidate conversion to be able to shows what kind of meaning "MPU" of the conversion candidate is. In addition, 3 set as the choice number of times is changed to 4 when "MPU" shown as candidate conversion is chosen.

In addition, there is "a centimeter" as candidate conversion is set when there "is phlegm" when specifications in the third record is shown, and it was input a and letter. In addition, "- - -" set by each column of meaning and the English meaning shows that the meaning of the term and an English meaning are not set. In addition, 10 set as the choice number of times is changed when "a centimeter" shown as candidate conversion is chosen.

Moreover, when drawing up specifications and a character input is carried out with "Module", it is set to the 4th record that it is shown that "meter" exists as a conversion candidate as a conversion candidate. Moreover, "---" set as each column of a meaning and an English meaning shows that the definition and the English meaning are not set up like the 3rd   record. Moreover, selection of the "meter" shown as a conversion candidate will change into 4 3 set up as the number of times of selection.

Moreover, since the same name of "Unit" in the column of the name of the 4th record is set up with the 3rd, if the term "Unit" is inputted by character input operation, a "centimeter" and "meter" will be chosen as a conversion candidate. And the number of times previously chosen in the "centimeter" with much number of times chosen from the number set as the column of each number of times of selection displays little "meter" later. It displays sequentially from a direction with much number of times chosen since a possibility that a direction with much selected number of times is an important term was high.

In addition, what the specifications of the same contents repeat are prevented, and is memorized because whether the same specifications are not memorized earlier when   you memorize the specifications which you made.

specifications search is expressed processing when the specifications which it is made next, and is memorized are searched.

Figure 6 shows the contents of the search query that is input when I search specifications. For a search query, transaction speed, capacity, limitation and each item of the object are set for a product scale, a process scale, a product term of a guarantee to show it in figure 6, and, in each item, a value is set.

If specifications search processing start directions are received, a terminal unit will receive a search query   from a user, and will choose what is considered to be specifications with which a user wishes to peruse from the item set up in the search query. When there are two or more selected specifications, dignity attachment is performed using the item set as the search query, and it displays as search results in order as a result of dignity attachment. In addition, although the specification glossary which a glossary selection part is related with the

appointed field as mentioned above, and is memorized was chosen and acquired and it explained that a term extraction part responded to character input operation, and extracted and presented a term from a specification glossary, it is not necessary to limit terminological extraction only from a specification glossary.

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Product Size Scale : Server
Process Scale : Development / Design
Product Insurance Period : 5 Years
Processing Speed : 8GHz
Storage Capacity : 240GB
Constraints : RoHS
Target : MPU
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Fig.6   the search query

For example, when the appointed field is pinpointed, the near field which carries out near within the limits of predetermined is simultaneously pinpointed in the appointed field. And the glossary (henceforth the "near glossary") memorized by matching with the field soon is also chosen and acquired at the same time it chooses and acquires a specification glossary. And it responds to character input operation from a user, and you may make it extract and show a term from a specification glossary and the near glossary. At this time, dignity attachment of each term can consider the method made by taking into consideration the distance of the appointed field and the near field, and the both sides of dignity attachment made by each term.

Thus, by enabling it to draw up specifications soon using a glossary, it becomes possible to draw up specifications using the term which is not set as the specification glossary. Moreover, although it explained that a term was sorted by the number of times of selection set as the glossary as mentioned above, it is not necessary to sort a term only by the number of times of selection. For example, when a certain term is chosen 3 times continuously, you may set up separately the sorting rule of judging the term to be a term with the highest importance.

Moreover, although it explained that the product field was constituted by a process scale and the product scale   as mentioned above, you may set up a separate scale, for example using the same process scale.

3.2 Principe of proposed second method

the form of the second enforcement of this article is explained next.

The present embodiment mode is similar to a form of the first enforcement except that it is different that a process scale is not included in a search query. On this account the same mark about the component which is approximately similar to a form of the enforcement of the first above is referred. and is omitted the explanation appropriately.

figure 7 shows a product field consisting of a process scale and a size scale . A process scale is set by the cross axle to show it in figure 7, and a product scale   is set in a vertical axis. For a process scale, six phases of scales of a plan / development / design and fabrication / an examination / a field / the collection are set in order of the duties process of a product becoming the object of specifications from the left to the right. For a product scale, four phases of scales of server PC mobile / the LSI are set in the big order of the scale of the product from the top to the bottom. 24 product fields consist of it by this process scale and a product scale
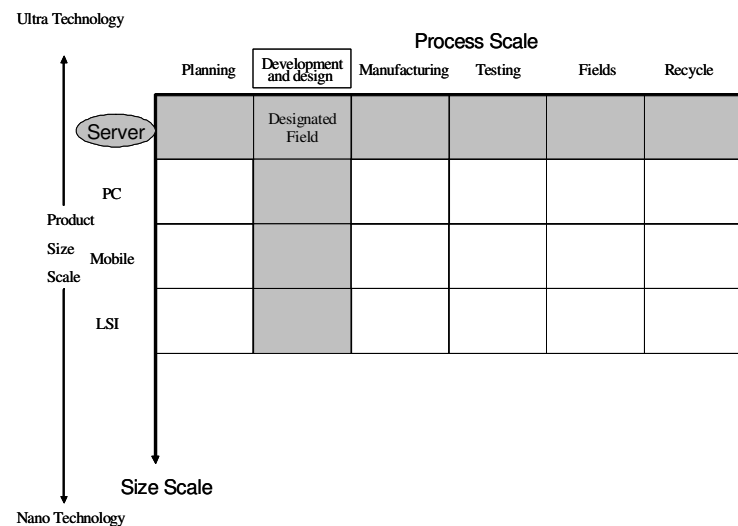

Fig.7 A product field consisting of a process scale and a size scale

When the specifications it is going to search at the time [specifications] are the products of a server class as a product scale, the server of a product scale   is specified. Then, the six

product fields where the slash with which the product scale was subtracted from the upper left matched as

When only a product scale is included in a search query by performing such a processing, some product fields in the whole are identified as an appointment field, and it is early, and the appointment field can search specifications because I search word appearance frequency only for appointment specifications touched correspondence and perform a heaviness charge account. In addition, I can prevent an information retrieval noise by unnecessary specifications joining a result without, as a result, specifications touched correspondence being displayed by the product field except the appointment field because, as a result, only the designated specifications that it was added correspondence to the designated field are displayed.

In addition, also when only a process scale is contained in a search query, the same effect as the specifications search processing in the form of this enforcement is produced by performing specifications search processing and same processing.

4. Conclusions

Software and hardware of information processing products such as servers, mobile computer, industrial equipments are designed by design standards and specifications and the like. In scripting specifications and other documents, it is very tough order and special skill or experiences must be held by designers. To solve theses problems and make them easy, SIMDES (Specification Maker for Design Standard) is proposed to deliver technical terms, technical symbols or units depending on product's design process and product's size scale from host dictionary on the server. It also stock-piles new technical terms, units by registering by a user. As result, appropriate technical term deliberations are possible to designers. And development cost can be reduced.

In conclusion, proposed SIMDES has the following five features to solve the problems of scripting software and hardware specifications for design, manufacturing, testing, and maintenance.

(1) In the specifications creation support program which supports creation of the specifications about a predetermined product Computer, the process scale according to the operating process which is the target of the specifications, The target product out of the product field pinpointed from the product scale according to the size which occupies space If the appointed field is pinpointed by specifying the process scale, and the product scale From a glossary memory means by which the glossary which is an aggregate of the term used for the specifications is memorized by relating with the product field A glossary selection means to choose the specification glossary matched with the appointed field, When character

input operation for drawing up the specifications is performed A term extraction means to extract the term corresponding to the character input operation from the specification glossary, and to show the term which extracted as a character string candidate, Specifications creation support program characterized by making it function by carrying out.

(2) The neighborhood glossary matched with the neighborhood field which carries out the neighborhood to the appointed field within the limits of predetermined with the specification glossary as the glossary selection means The value of the process scale corresponding to the neighborhood field, and the product scale, According to a difference with the value of the process scale corresponding to, and the product scale, carry out dignity attachment, and as the term extraction means The specification glossary and the neighborhood glossary are searched with the priority according to the dignity attachment, Specifications creation support program of the claim 1 statement characterized by performing processing.

(3) The specifications further drawn up by the computer are related with the appointed field set up at the time of creation. A specifications registration means to register with a specifications memory means as registration specifications, the process scale, and the product scale at least Either, If the query containing the term is set up and the search demand of the registration specifications is performed The specifications creation support program of the claim 1 statement characterized by searching the specifications memory means based on the query, considering it as a specifications search means to extract the registration specifications which suit the query, and making it function.

(4) It starts from the registration specifications searched as the specifications search means based on the query. The link information which connects the registration specifications and the registration specifications relevant to the registration specifications is followed in order. All the registration specifications tied up by the link information are extracted. The specifications creation support program of the claim 3 statement characterized by performing processing which computes the word frequency of appearance of the term in the query which appears on the extracted registration specifications, and specifies the degree of similar between the registration specifications extracted according to the word frequency of appearance.

(5) In the specifications creation support equipment which supports creation of the specifications about a predetermined product The glossary memory means memorized by the glossary which is an aggregate of the term used for the specifications relating with the

product field pinpointed from the process scale according to the operating process which is the target of the   specifications, and the product scale according to the size in which the target product occupies space, If the appointed field is pinpointed out of the   product field by specifying the   process scale of 1, and the   product scale of 1 When character input operation a glossary selection means to choose the specification glossary matched with the appointed field, and for drawing up the   specifications is performed A term extraction means to extract the term corresponding to the   character input operation from the   specification glossary, and to show the term which extracted   as a character string candidate, Specifications creation support equipment characterized by having.

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