

COMMISSIONER'S DECISION

Section 2:

Database Processing System for Storing and Retrieving Records. The hardware, firmware, and other elements of the system combine to access stored material in a manner to make the system acceptable under S.2. Rejection withdrawn.

This decision deals with Applicant's request for review by the Commissioner of Patents of the Final Action on application 239,298 (Class 354-241) filed November 10, 1975, assigned to Honeywell Information Systems Inc. entitled DATABASE INSTRUCTION FIND DIRECT. The inventors are Benjamin S. Franklin and Charles W. Bachman. The Examiner in charge issued a Final Action on March 29, 1979, refusing to allow the application.

The application relates to a data processing system having apparatus which stores records in a predetermined grouping of sets. The system provides an access arrangement which addresses the desired set and retrieves not only the searched record but also the prior or next record without the need of formulating another direct address. The format of a system base is shown in figure 6 and the means to fetch addressed information is shown in figures 13a and 13b. Various types of memory records and pointers are illustrated in figures 15a to 15h, and a format of a member record is shown in figure 15c where the next pointer and the prior pointer are located in certain relative positions. The database record recognized by the system is shown in figure 16a, the page descriptor which addresses the database is depicted in figure 16b, and the access control pointer is shown in figure 16c. The hardware/firmware flow chart of figure 17 implements the location of a database page in the main memory of the system.

It is apparent from the lengthy description that a complex system is presented in the application, and several drawings are involved in illustrating the operation to obtain Applicant's results. For sake of brevity therefore, we have not reproduced any drawings. We have, however, reviewed all the drawings and their description in assessing the subject matter in the application.

In his Final Action the Examiner said, in part, as follows:

. . .

The applicant has failed to disclose or claim computing apparatus programmed (or microprogrammed) in a novel manner, where the patentable advance is in the apparatus itself. As noted on page 3 of the letter most functionality is added to a computer as the result of some algorithm. The applicant has expressed the algorithm as flow charts and tables residing in memory of prior art apparatus. The applicant has not developed the algorithm to the point where new apparatus has been disclosed in accordance with Section 36(1), and thus the application remains rejected as being directed to non-statutory subject matter in view of the definition of invention in Section 2.

. . .

In responding to the Final Action, the Applicant stresses his invention is a part of a new computer system utilizing a firmware implementation as part of its unique architecture. He argues, in part, as follows:

The present invention relates to a unique computer system which can address a database record directly and having once found that database record it can utilize that database record to address other database records in that set of database records such as the prior record, the following record, etc., without resorting again to the technique of finding another direct address for the second database record and the third direct address for the fourth database record. To the Applicant's knowledge, nothing like that was available in the prior art until this invention. The closest appears to be some form of indexing. The elements recited in, for example, claim 1 are hardware. The first and second means are means for storing coded electronic signals which is clearly hardware. The third means is a means for fetching into scratchpad memory a database pointer address for the particular database record being sought. This fetching means is shown as element 1318 of Figure 1a which is hardware. When this hardware is added to the hardware recited in the preamble, a unique non-obvious combination results.

The Examiner has stated that the patentable advance must be in the apparatus itself and seems to be implying that elements of the apparatus must be novel per se. It is submitted, however, that an invention may reside in a novel combination of elements even if some of them are known per se. The invention concerns hardware and firmware developments which effect permanent or semi-permanent changes in the actual data processing apparatus, so that it may function in an entirely novel manner not heretofore disclosed by the prior art. This is entirely different from the situation in which an external program is fed into the computer and effects momentary and constantly changing alterations in the states of various registers, etc.

The invention is concerned with the actual physical structure of the machine and is not simply an algorithm or computer program. The invention could clearly not have been developed by a programmer utilizing his expected skill.

The issues before the Board are whether or not the application sets forth subject matter that is within the definition of Section 2 of the Act, and whether or not the specification is sufficient in view of Section 36(1).

Claim 1 reads:

In an internally programmed data processing apparatus having a CPU, a scratchpad memory, and random access memory comprised of a plurality of segments of addressable space each segment having an identifying segment number associated with each segment for identifying its associated segment each of said segments delineated by upper and lower variable bounds, each of said segments being further subdivided into at least one page of a predetermined fixed size located at a predetermined displacement address within said segment and having an identifying page number, each of said pages for storing a plurality of files of database records grouped in sets of database records, each set having one owner record and at least one member record, each of said pages also including first address information for locating any one of said database records of a selected one of said sets from a predetermined location in a selected one of said pages, said data processing apparatus also having a system base for locating relative to said system base the absolute location of predetermined ones of said segments, pages, and database records; said data processing apparatus further having an index register for storing a selected database-index address comprised of a database pointer address for forming an address of a predetermined one of said database records, each of said database records having at least one of said database pointers comprised of an area, page and line address, said area address for locating a predetermined file of said database record, said page address for locating a predetermined group of said database records within said file, and said line address for locating the predetermined one of said database records; instruction hardware, responsive to a find-direct instruction having a first number for locating a first index register storing a first area address, first page address and first line address for locating a first of said database records, said instruction hardware comprising: (a) first means having a first predetermined arrangement for storing coded electronic signals indicative of a database pointer address of a selected first of said member records of said selected ones of said sets of database records; (b) second means coupled for being responsive to said first means and having a second predetermined arrangement for storing coded electronic signals indicative of the segment and page number of a selected one of said pages located in a selected one of said segments; and, (c) third means coupled for being responsive to said first and second means for fetching into scratchpad memory said database pointer address.

We find guidance in assessing the computer-related subject matter of this application, from Schlumberger Canada Ltd. v. Commissioner of Patents (1981) 56 C.P.R. 204. It is to be noted this decision was not available to the Applicant nor to the Examiner at the date of the Final Action. Pratte, J. commented as follows:

In order to determine whether the application discloses a patentable invention, it is first necessary to determine what, according to the application, has been discovered.

and

I am of the opinion that the fact that a computer is or should be used to implement discovery does not change the nature of that discovery.

We have carefully weighed the subject matter described in the application, the arguments presented by Applicant, and the guidance provided by Schlumberger, against the reasons advanced by the Examiner in his Final Action. We recall from the Final Action that the Examiner agreed "...the Applicant has disclosed a microprogram rather than an external program..." and that "...the application is not software wherein functional statements are placed in computer main memory and then translated by a compiler or assembler." We are aware the Examiner felt that all the elements were not apparatus, and that all the figures do not show hardware. In view of the combination of all the elements however, to produce a result not previously attainable, and realizing that a combination of old elements to achieve that result may be patentable provided the prior art does not show that the combination is known, we do not see how Applicant's device may be considered not to be within the definition of patentable matter. The various means disclosed are set out in claim 1 in terms which we feel are apparatus.

It is appropriate to refer to Applicant's letter earlier in the prosecution, dated March 30, 1978, where Applicant discussed claim 1, in part, as follows:

"When new claim 1, for example, is read in its entirety, it will be noted that it claims a unique computer system which can address a database record directly and having once found that database record it can utilize that database record to address other database records in that set of database records such as the prior record, the following record, etc. without resorting again to the technique of finding another direct address for the second database record and the third direct address for the fourth database record. To the Applicant's knowledge nothing like that was available in the prior art until this invention. The closest appears to be some form of indexing. Note that all the elements recited are hardware. The first and second means are means for storing coded electronic signals. It can hardly be denied that such devices are hardware. The third means is a means for fetching into scratchpad memory a database pointer address for the particular database record being sought. This fetching means is shown as element 1318 of Figure 13a. It can hardly be denied that this is hardware. When this hardware is added to the hardware recited in the preamble, a unique non-obvious combination results which has the functions previously recited supra.

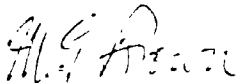
We are persuaded that claim 1 should be considered as a combination of apparatus. We note however, that later in the March 30, 1978 response, the Applicant identifies his invention in the following terms:

The instant invention is an apparatus which is provided to handle records which have a predetermined arrangement, and which are grouped in sets. Each set has an owner record and a member record. Each owner record has information which refers it to member records. Each member record has information which refers it to a prior member record or a next member record or an owner record. Accordingly, the hardware disclosed herein has the facility of accessing directly either an owner record or a member record and once having accessed for example, a member record the apparatus need not go back and reformulate another direct address to get another member record of that set but can utilize the pointers in the member records to address either a next member or a prior member etc. As now amended, this is precisely what is claimed in hardware.

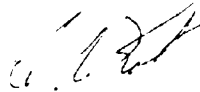
We observe the prosecution was concerned with whether the invention was proper in view of Section 2 of the Act, however, we see no discussion arose concerning the definition of the invention. It would appear that claim 1 does not include apparatus to address the next member or a prior member, since these two members are dealt with in claims 2 and 3 respectively. Therefore while we find the application and the claims are acceptable in view of Sections 2 and 36(1) of the Act, we make no finding with respect

to patentability of the claims, no art having been cited during the prosecution. We believe a Hearing with respect to the issues concerning the above Sections should not be convened. Should an issue arise however, concerning the claimed subject matter, then a Hearing might be significant.

We recommend the rejection of the application be withdrawn and that the application be returned to normal prosecution.



M.G. Brown
Acting Chairman
Patent Appeal Board



S.D. Kot
Member

I concur with the findings and the recommendation of the Patent Appeal Board. Accordingly, I withdraw the refusal of the application and remand it for prosecution consistent with the findings.



J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 9th day of April 1986

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