NON-STATUTORY Section 2: Communication System

Communication between computer systems wherein data transfer without having the central processing unit tied up at all times by the use of a single sender buffer is acceptable under Section 2. Amendments submitted after the Final Action.

Final Action - Withdrawn

This decision deals with the Applicant's request for review by the Commissioner of Patents of the Final Action on application 364,506 (Class 340-82) filed November 12, 1980, assigned to Fujitsu Limited entitled INTER-SUBSYSTEM COMMUNICATION SYSTEM. The inventors are T. Tsuchimoto; S. Kaneda; T. Miyazawa; T. Shimada; H. Suzuki; M. Sanagi and K. Hiraoka. The Examiner in charge issued a Final Action on June 23, 1983, refusing to allow the application. A Hearing was held on November 4, 1987, at which Applicant was represented by his Patent Agent, Mr. V. Marston.

This invention relates to a system for establishing communication between a plurality of computer systems wherein data transfer utilizes a data processing system having sender and receiver subsystems operating under the control of an independent or common operating system. Figure 4 and amended figure 10 shown below are illustrative of the application.

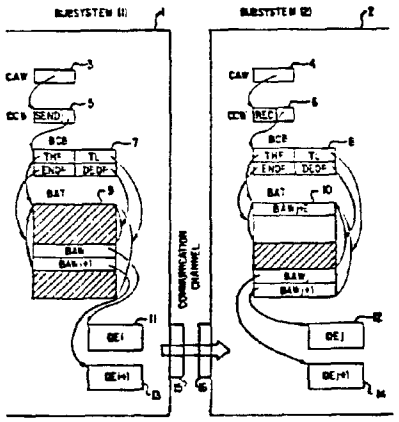

FIG. 4

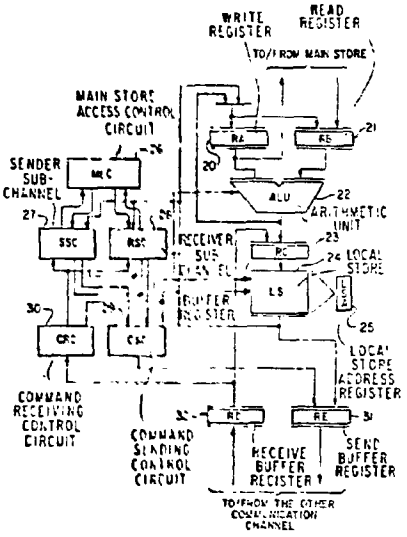

FIG 10

The communication system in Figure 4 shows subsystem 1 provides the sending side and subsystem 2 is the receiver side. When one-way communication for the reverse direction is provided, a two-way communication path can be realized between the subsystems. The programs in the sender subsystem writes the queue element format data into the sending buffer specified by the enqueue pointer of the sending buffer control block and instructs data transfer to the communication path by updating said enqueue pointer.

In rejecting the application in view of Section 2 of the Patent Act for not being directed to statutory subject matter, the Examiner says, in part, as follows:

> Having some parts of a computer memory (or store) designated as "buffers" merely means that some particular memory locations of the computer store some particular data, which is commonplace in computers; the determination of which data to store in which memory location is determined by computer program. This, too, is commonplace.
>
> The use of "buffer memories" to accommodate incoming-outgoing data constitutes the obvious use of "buffer memories" for their intended dictionary-defined purposes, namely, to store incoming or outgoing data.
>
> "Said sender subsystem has a sending buffer address table having n entries while the receiver subsystem has a receiving buffer address table" (lines 3-4):-
>
> These "tables" are part of a program, and not physical entities.
>
> "Each of said entries (BAW) contains a header address information (BA) of corresponding said sending and receiving buffers and the length information or the final address information (BL) of the relevant buffer" (lines 5-8):-
>
> These "address informations" and "length informations" are part of a program and not physical apparatus.
>
> . . .
>
> It is held that the purported apparatus of Fig. 10 has no inherent property or capacity to supply the functions (such as above) of claims 1 etc.
>
> It is further held that the purported apparatus of Fig. 10 would be capable of supplying those functions only by virtue of operating under the specific control of a specific program and not otherwise.

> This view is held to be reinforced by the bulk of the disclosure on pages 5, 6, 7, 8, 9 and 10 which disclose the claimed results as having been achieved by means of programming. ...
>
> ...It should be noted that every program could be regarded as resulting in a different configuration of a computer memory location and of their interrelationships, and could therefore be argued as resulting in a new computer-apparatus. Such view that "the apparatus must be novel because the program is novel" has, however, not been upheld by jurisprudence. ...

In response to the Final Action, the Applicant submitted amended claims 1 to 13, replaced cancelled pages 1 to 13 of the disclosure with pages 1 to 18 and amended figure 10 as well as requesting permission to add new figures 11 and 12. The applicant stated (in part):

> The present invention is directed to a computer system which eliminates the need to issue a start I/O command to a communication channel in a processing system. This elimination of the start I/O command reduces significantly the input-output processing overhead in the main CPU. The communication channel monitors the contents of enqueue and dequeue pointers to determine whether data should be sent to the communication channel of another computer system. When data is available for transmission, the channel issues a send request command to the channel of the other communication system and then waits on a receive-ok command. When the receive-ok command is received, the channel retrieves the data to be sent from main storage and stores it in local storage after which the channel sends the data in units of a block to the other subsystem. After the last block is sent, the channel waits for an end reporting command from the channel of the other computer system, then proceeds to update the dequeue pointer. After the dequeue pointer is updated, the channel checks to see if another queuing element is ready for transmission.
>
> ...Although the system operates under program control and manipulates data, claim 1 is directed to a combination including hardware elements and does not merely claim a program or algorithm per se. It is submitted that in Canada, as in the United States, it is improper to isolate particular steps of a claim directed to calculations or program steps and then reject the entire claim as being directed to non-statutory subject matter. Doing this would fail to take into account the very real physical meaning of the invention. ...
>
> ...No doubt there are numerous Canadian patents having claims which include steps of calculating, specific formulae, or steps carried out by a program but, as is clear from the foregoing, it is the combination as a whole which determines whether the claim is directed to statutory subject matter and not individual elements of the claim. As the claims clearly include physical steps or apparatus and not merely calculations or the like, it is submitted that they are directed to statutory subject matter. ...

The issue before the Board is whether or not the subject matter of the application is patentable in view of Section 2 of the Patent Act. The amendments submitted in response to the Final Action have been considered.

Claim 1 now reads:

> An intercomputer system communication system in a data processing system comprising first and second subsystems each having main storage and each operating under the control of an operating system; said first subsystem further comprising a sender subsystem having n sending buffers in the respective main storage; said sender subsystem further comprising a sending buffer address table in the respective main storage having n entries; said receiver subsystem further comprising a receiving buffer address table in the respective main storage having m entries; each of said n and m entries comprising header address information for corresponding said n sending and m receiving buffers and length information for the respective buffer; said sender subsystem further comprising a sender buffer control data block in main storage including: a header address for the sending buffer address table; said n entries in said sending buffer address table; an enqueue pointer which indicates which of said n entries is to be enqueued next; and a dequeue pointer which indicates which of said n entries is to be dequeued next into the respective main storage; said receiver subsystem further comprising a receiver buffer control data block in main storage including: a header address for the receiving buffer address table; said m entries in said receiving address buffer table; an enqueue pointer which indicates which of said m entries is to be enqueued next; and a dequeue pointer which indicates which of said m entries is to be dequeued next into respective main storage; and said communication system further comprising a communication unit, operatively connected between said sender subsystem and said receiver subsystem, for transferring data stored in said n sending buffers of the sender subsystem to said m receiving buffers of the receiver subsystem.

During the Hearing, the Examiner maintained that the claimed features can only be found in the form of a program and not in the physical entities. Further, he emphasized that any physical entities mentioned in the claims are standard components of any computer and when looking at the claimed inventive features, they are not in physical form but only in the form of a program.

Mr. Marston stated that the applicant's system has apparatus such as storage systems and C.P.U.'s arranged in a manner different from any known

system. He points out that the applicant's system, as explained in the disclosure, enables the transfer of data without having the C.P.U. tied up at all times by utilizing data stored in a single sender buffer area, namely the queue element.

In assessing the kind of subject matter presented by Applicant, we are guided by the decision in Schlumberger Canada Ltd. v. The Commissioner of Patents (1981) 56 C.P.R. (2d) at 204, and the following passages of Pratte, J.:

> 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 opinion that the fact a computer is or should be used to implement discovery does not change the nature of that discovery. What the appellant claims as an invention here is merely the discovery that by making certain calculations according to certain formulae, useful information could be extracted from certain measurements. This is not, in my view, an invention within the meaning of Section 2.

It is clear that the applicant shows a communication system operation between computer systems wherein data transfer processing utilizes sender and receiver subsystems operating under the control of an independent or common operating system. The sender subsystem has the sending buffer address table having n entries while the receiver subsystem of the receiving buffer address table having m entries on their respective main stores. Further the sender system has a buffer control block wherein an enqueue pointer indicates a buffer address stored in the table to be enqueued and a dequeue pointer to indicate a buffer address being stored in the table to be dequeued next on the register of the relevant sender subsystem. We note that the applicant uses a dedicated arrangement between sender subsystems and receiver subsystems for a one-to-one relationship instead of the conventional inter-channel connection system utilizing communication between multiprocessors as conventionally used. We are satisfied in view of Schlumberger, supra, that the application presents patentable subject matter under Section 2 of the Act.

Looking at the amended claims, we see that they are directed to an inter-computer system communication system and, in our opinion, they are directed to the invention described in the application.

We find, therefore, that the application discloses a communication system that pertains to more than merely performing calculation steps to derive particular measurements. In the absence of any cited art, we are satisfied that the application is directed to patentable subject matter and may be allowable.

We recommend the withdrawal of the rejection of the application for being directed to non-statutory subject matter.

M.G. Brown
Acting Chairman
Patent Appeal Board

S.D. Kot
Member

I have reviewed the prosecution of the application. I concur with the findings and recommendations of the Patent Appeal Board. Accordingly, I withdraw the Final Action, and I am remanding the application to the Examiner for prosecution consistent with the recommendation.

J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 17 day of February 1988

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