

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HWA C. TORNG and MARTIN DAY

Appeal No. 95-1123
Application 08/028,757¹

ON BRIEF

Before JERRY SMITH, BARRETT and CARMICHAEL, *Administrative Patent Judges*.

CARMICHAEL, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Application for patent filed March 9, 1993. According to appellants, this application is a continuation of Application 07/469,634 filed January 24, 1990, now abandoned.

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This is an appeal from the final rejection of claims 1-7, which constitute all the claims remaining in the application.

Claim 1 reads as follows:

1. A pipelining processor comprising a plurality of functional units and an instruction issuing unit operatively connected thereto for issuing multiple instructions concurrently and for allowing for the processing of instructions in an out-of-order sequence, said instruction issuing unit having means for handling an interrupt of said processor to facilitate continued operation upon said out-of-order instructions upon termination of said interrupt, said pipelining processor further comprising an execution unit, and said instruction issuing unit including an instruction window and an instruction buffer, said instruction issuing unit being operatively connected to said execution unit, said instruction window being adapted to store a value representative of a number of uncompleted instructions, so that when an interrupt to said processor occurs, previously issued instructions that have been interrupted and are hence uncompleted can be executed by said execution unit, said value providing a precise interrupt point for returning to an interrupted program by defining a precise interrupt boundary as said group of instructions in said instruction window.

The examiner's answer cites the following prior art:

Acosta et al. (Acosta), "An Instruction Issuing Approach to Enhancing Performance in Multiple Functional Unit Processors", IEEE Transactions on Computers, Vol. C-35, No. 9 (September 1986) pages 815-828.

Inagami et al. (Inagami)
1, 1988

4,782,441

Nov.

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Torng
1989

4,807,115

Feb. 21,

OPINION

The claims are subject to three rejections:
indefiniteness, non-enablement, and obviousness.

Indefiniteness

The claims stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The examiner raises eight points of ambiguity in support of the rejection. Examiner's Answer at 3-5.

The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope. *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). In the present case, the examiner's objections point out the broad scope of the claims, but they do not demonstrate indefiniteness. Therefore, we will not sustain this rejection.

Non-enablement

The claims stand rejected under 35 U.S.C. § 112, first paragraph, as being non-enabled by the specification.

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The burden initially falls upon the Examiner to establish a reasonable basis for questioning the adequacy of the disclosure. *In re Strahilevitz*, 668 F.2d 1229, 212 USPQ 561 (CCPA 1982); *In re Angstadt*, 537 F.2d 498, 190 USPQ 214 (CCPA 1976); and *In re Armbruster*, 512 F.2d 676, 185 USPQ 152 (CCPA 1975). In the present case, the entirety of the examiner's explanation is contained in the following sentence:

Appellant failed to adequately teach how to make instruction issuing unit and means for handling an interrupt, and it would require a person of ordinary skill in the art undue experimentation to develop such means.

We find this insufficient to establish a reasonable basis for questioning the adequacy of the disclosure. Because the examiner has not stated a *prima facie* case of non-enablement, we will not sustain this rejection. Moreover, the examiner did not respond to the reply brief's arguments against this new ground of rejection.

Obviousness

The claims stand rejected under 35 U.S.C. § 103, as being unpatentable over Acosta in view of Inagami.

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As pointed out by the examiner, Acosta teaches the invention of claim 1 except for the recited interrupt handling means in which the number of uncompleted instructions is stored in the instruction window. Examiner's Answer at 5-6.

Inagami teaches storing the number of uncompleted instructions in the instruction window. Column 3, line 17, through column 5, line 58. This is done to restart the execution of an interrupted program at the appropriate point effectively without waste, i.e., to provide a precise interrupt point. Abstract, lines 8-10.

We agree with the examiner that Inagami suggested the desirability of storing the number of uncompleted instructions in the instruction window of Acosta in order to restart the execution of an interrupted program at the appropriate point effectively without waste.

Appellants argue that the combination is inappropriate because Inagami cannot process out-of-order instructions. Appeal Brief at 8-9. However, Inagami was not relied on for this. Acosta is an out-of-order machine, and we find that one of skill in the art could have easily applied

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Inagami's teaching of storing the number of uncompleted instructions to Acosta.

Appellants also argue that Inagami's window does not contain issued and non-issued instructions. This argument finds no basis in claim 1. However, claims 2-7 require the means for handling an interrupt to detect the number of instructions unissued at the time of interrupt. Inagami contains no relevant teaching regarding unissued instructions. Rather, Inagami addresses instructions that are issued but whose execution is not yet complete.

Thus, we will sustain the obviousness rejection of claim 1 but not claims 2-7.

CONCLUSION

The rejections of claims 1-7 under 35 U.S.C. § 112, first and second paragraphs, are not sustained. The rejection of claim 1 under 35 U.S.C. § 103 is sustained. The rejection of claims 2-7 under 35 U.S.C. § 103 is not sustained.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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JERRY SMITH)	
Administrative Patent Judge)	
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