

HThe opinion in support of the decision being entered today was not written for publication and is not precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte XIAO SUN and CARMIE A. HULL

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Appeal No. 1997-2112  
Application No. 08/398,831

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ON BRIEF

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Before KRASS, RUGGIERO and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of Claims 14-25, 27-32, and 34, all the claims remaining in the application.

We reverse.

BACKGROUND

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The invention is directed to a method and apparatus for testing conformance of electronic hardware or software with a finite state machine model. Claim 14 is reproduced below.

14. A method of generating a Verification Test Sequence (VTS) for use in testing conformance of a Machine Under Test (MUT) with a Finite State Machine (FSM) Model, wherein:

said FSM Model has a plurality of Model States (ST) and a plurality of State Transitions (TR),

each of the plurality of State Transitions (TR) is located between a First Model State and a Second Model State,

each of the plurality of State Transition (TR) has a corresponding Input/Output (I/O) Sequence,

each I/O Sequence includes an Input Stimulus and an Output Response corresponding to the Input Stimulus,

each Input Stimulus comprises an Input Stimulus Signal, and each Output Response comprises an Output Response Signal, said method comprising the steps of:

(a) identifying at least one member of each of one or more Sets of Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets, wherein:

each identified member of each Set of Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets is an Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set, each member of each Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set is an Edge-Under-Test (EUT) I/O Sequence,

each Edge-Under-Test (EUT) I/O Sequence is a First Sequentially Ordered Series of I/O Sequences corresponding to a First Ordered Sequence of State Transitions,

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each Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set corresponds to an Edge-Under-Test (EUT),

each Set of Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets consists of Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets corresponding to the same Edge-Under-Test (EUT), and

all Edges-Under-Test (EUT) have corresponding I/O Sequences;

(b) selecting one Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set from each Set of Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets to form a plurality of Selected Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets, wherein:

each member of each of the plurality of Selected Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Sets is a Selected Edge-Under-Test (EUT) I/O Sequence; and

(c) constructing for storage in a memory a plurality of Test Sequences (TS), wherein:

each Test Subsequence (TS) comprises one Selected Edge-Under-Test (EUT) I/O Sequence and the I/O Sequence corresponding to the Edge-Under-Test (EUT) corresponding to the Selected Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set containing the Selected Edge-Under-Test (EUT) I/O Sequence;

each Test Subsequence (TS) is a Second Sequentially Ordered Series of I/O Sequences corresponding to a Second Ordered Sequence of State Transitions (TR), and

each said Test Subsequence (TS) starts at a Test Subsequences (TS) First State and ends at a Test Subsequences (TS) Last State.

The examiner relies on the following reference:

Dahbura et al. (Dahbura) 4,991,176 Feb. 5,  
1991

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Although not prior art, application 08/399,020 (now U.S. Patent 6,004,027) is also at issue.

Claims 14-25, 27-32, and 34 stand rejected under 35 U.S.C.

§ 103 as being unpatentable over Dahbura.

Claims 14-25, 27-32, and 34 stand provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of application 08/399,020.

We refer to the Final Rejection (Paper No. 5) and the Examiner's Answer (Paper No. 12) for a statement of the examiner's position and to the Brief (Paper No. 11) for appellants' position.

#### OPINION

##### The rejection over Dahbura

The examiner has rejected all claims under 35 U.S.C. § 103 as unpatentable over Dahbura.<sup>1</sup> The statement of the rejection which includes independent Claims 14, 27, 32, and 34 is set forth on pages 5 and 6 of the Answer. Appellants

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<sup>1</sup> The examiner states that Claims 14-34 are rejected. (See Answer, page 4.) The claim numbers are inconsistent with section (4) on page 2 of the Answer, which correctly reflects that the amendment submitted November 19, 1996 (Paper No. 9) has been entered. The amendment canceled Claims 26 and 33.

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argue, inter alia, that the examiner has ignored significant details in Claims 14, 27, 32, and 34. (See Brief, page 8.)

Obviousness is a question of law based on findings of underlying facts. See Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). The examiner bears the initial burden of presenting a prima facie case of unpatentability. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

We cannot sustain the rejection for the reason that the examiner has failed to set out a prima facie case of obviousness of the claimed subject matter. Two brief steps are listed on page 5 of the Answer as purportedly being disclosed by Dahbura, and two brief steps are listed on the same page as purportedly not being disclosed by Dahbura. As such, the conclusion of obviousness is not supported by the required factual findings regarding the differences between the claims and the prior art.

For example, each of Claims 14, 27, 32, and 34 recite that "each Test Subsequence (TS) comprises one Selected Edge-Under-Test (EUT) I/O Sequence and the I/O Sequence corresponding to the Edge-Under-Test (EUT) corresponding to

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the Selected Edge-Under-Test (EUT) Unique I/O Sequence (UIO) Set containing the Selected Edge-Under-Test (EUT) I/O Sequence," along with two further statements limiting the step or means for constructing a plurality of test subsequences. The recitation apparently relates to the second step (set forth on page 5 of the Answer) that is purportedly not taught by the reference: "constructing a test subsequence for storage in a memory." (Answer, page 5.) However, the claims are more specific than merely "constructing a test subsequence"; the claims recite how a plurality of test subsequences are constructed.

The findings concerning motivation to modify the reference are also deficient. Most seem to be based on the explicit disclosure of Dahbura, and yet the modifications depart from the teachings of the reference. While we tend to agree with the general statements such as "breaking a problem into its component parts improves upon the controllability of test generation" (Answer, page 6), the generalities do not address the claims at issue. We would agree that breaking a problem into smaller parts may have been obvious to the artisan. However, the claims are specific with regard to how

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the method or apparatus goes about achieving the results of breaking the problems into smaller parts and generating a verification test sequence (Claims 14, 27, and 32) or testing conformance of a machine under test (Claim 34).

The examiner's opinions in the remainder of the Answer have also been considered, but do not remedy the deficiencies in the rejection with regard to the underlying facts necessary to support a case of prima facie obviousness of at least independent Claims 14, 27, 32, and 34. The rejection of those claims, and the rejection of the depending claims, is therefore not sustained.

#### The double patenting rejection

The examiner has provisionally rejected all claims under 35 U.S.C. § 101 as claiming the same invention as "claims 1-30 of co-pending application Serial No. 08/399020." (Answer, page 3.) No claim-to-claim comparison is set forth. The offered analysis consists of the statement that "[t]he claims

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are directed to essentially the same subject matter." (Id. at 4.)

An inquiry into double patenting under 35 U.S.C. § 101 requires determination whether the "same invention" -- identical subject matter -- is being claimed twice. In re Vogel, 422 F.2d 438, 441, 164 USPQ 619, 621-22 (CCPA 1970). A useful test is to determine whether one of the claims could be literally infringed without literally infringing the other. Id.

Upon review of the file wrapper of application 08/399,020 we note that, subsequent to mailing of Examiner's Answer in the instant application, an amendment was submitted in the other application on August 17, 1997. The amendment was entered and the application ultimately issued (with twenty-six claims) as U.S. Patent 6,004,027. Each of the independent Claims 1, 16, 17, and 18 in U.S. Patent 6,004,027 was amended subsequent to entry of the instant provisional double patenting rejection. Since the claims of application 08/399,020 have changed since entry of the present ground of rejection, we dismiss the provisional double patenting rejection under 35 U.S.C. § 101 as moot.

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The examiner also appears to raise the spectre of "provisional double patenting" with respect to "recently allowed 08/403,332"<sup>2</sup> on page 11 of the Answer. However: (1) no formal rejection has been entered; (2) no basis for the "provisional double patenting" (e.g., statutory or non-statutory) rejection is set forth (in fact, although appearing under a "double patenting" heading, it is not entirely clear that it is double patenting which is to "be used to reject the instant application," but such is presumed in view of commentary on page 10 of the Answer); (3) no claim-to-claim comparison of the respective subject matter is set forth; and (4) a position that the instant claims are unpatentable for obviousness in view of a disclosure by another in 1991, and yet conflict with claims in a later-filed application in which all claims have been determined by the examiner to be patentable, appears to be inconsistent on its face. For at least the foregoing reasons, we decline to chase the spectre.

#### CONCLUSION

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<sup>2</sup>Application for patent filed on March 13, 1995, now U.S. patent 5,555,270, with inventors Xiao Sun and Carmie A. Hull.

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The rejection of Claims 14-25, 27-32, and 34 under 35 U.S.C. § 103 as being unpatentable over Dahbura is reversed.

The provisional rejection of Claims 14-25, 27-32, and 34 under 35 U.S.C. § 101 as claiming the same invention as that of application 08/399,020 is dismissed as moot.

REVERSED

	)	
ERROL A. KRASS	)	)
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
JOSEPH F. RUGGIERO	)	
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
	)	
HOWARD B. BLANKENSHIP	)	
Administrative Patent Judge	)	

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