

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PREM P. JAIN

Appeal No. 97-2477
Application 08/212,908¹

ON BRIEF

Before LEE, KRASS, and THOMAS, Administrative Patent Judges.
LEE, 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 1-24. Claim 25 has been allowed.

References relied on by the Examiner

Dunn	4,813,013	Mar.
14, 1989		
Watkins et al. (Watkins)	5,220,512	Jun.
15, 1993		

¹ Application for patent filed March 14, 1994.

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The Rejections on Appeal

Claims 1-24 stand finally rejected under 35 U.S.C. § 112, first paragraph, as being without written description support in the specification as filed.

Claims 1-24 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Dunn and Watkins.

The Invention

The invention is directed to a method for graphically designing a digital device (claim 1) and a method for capturing a digital device as a behavioral description and for converting the behavioral description to a structural description (claim 11). Independent claims 1 and 11 are reproduced below:

1. A method for graphically designing a digital device, comprising the steps of:

identifying a fixed and limited number of descriptors which behaviorally describe any digital device to be designed;

placing symbolic icons representing at least two of said descriptors upon a graphic display and operationally connecting said icons with an arc placed therebetween; and

using a pull-down menu activated from said placed icons, thereafter defining a list of

attributes to said icons, wherein said attributes include both data path and control path information for a digital device graphically designed from said placed icons.

11. A method for capturing a digital device as a behavioral description and for converting the behavioral description to a structural description, said method comprising the steps of:

constructing a behavioral description of a digital device upon a graphic display by graphically connecting a set of symbolic icons drawn from a fixed number of icons contained within an icon library having fewer than fifteen icons;

mapping user-defined inputs to each of said symbolic icons to define a graphical model having data path attributes of said digital device;

representing said graphical model as a matrix of data values corresponding to binary values at a plurality of internal states within said graphical model;

applying a set of input values to said matrix of data values to modify said matrix and, simultaneous with rising edges of a clocking signal, monitoring the modified said matrix at select said internal states;

determining events at the select said internal states, and determining transitions of said events at said internal states between said rising edges of the clocking cycle; and

combining events and transitions of events to produce a finite state machine having control path information, and merging said control path information with said data path attributes to produce a structural description of said digital device.

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Opinion

We reverse the rejection of claims 1-24 under 35 U.S.C. § 112, first paragraph for lack of adequate written description support in the specification as filed.

We reverse the rejection of claims 1-24 under 35 U.S.C. § 103 as being unpatentable over Dunn and Watkins.

A reversal of the prior art rejection on appeal should not be construed as an affirmative indication that the appellant's claims are patentable over prior art. We address only the positions and rationale as set forth by the examiner and on which the examiner's rejection of the claims on appeal is based.

The rejection of claims 1-24
under 35 U.S.C. § 112, first paragraph

In the final Office action (Paper No. 9) on page 2, the examiner identified the claim features at issue to be the following:

Claim 1: identifying a fixed and limited number of descriptors;

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Claim 11: a set of symbolic icons drawn from a fixed number of icons containing within an icon library having fewer than fifteen icons.

In the same final Office action on page 3, the examiner states that he "cannot find the support in the specification for the newly added feature." No further explanation was included in the Office action.

Focusing on what the examiner stated he cannot find, the appellant in his brief on page 10 pointed to particular portions of the specification as filed which in the appellant's view describes the added claim features which the examiner indicated he could not find in the specification. The presentation is specific, readily understood, and facially plausible. It is then up to the examiner to explain why the cited portions do not constitute an adequate written description for the claim features at issue. However, in the examiner's answer on page 4, the examiner simply reiterated his earlier statement that "[the examiner cannot find the support in the specification for the newly added feature." No further explanation was provided. The examiner has failed even to address the description pointed out by the appellant.

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On this record, then, it cannot be said that the examiner has made out a prima facie case for a rejection based on lack of written description in the specification. What we have is merely the examiner's conclusion which is not based on any reasoning or underlying factual findings. Accordingly, the rejection of claims 1-24 for lack of written description in the specification as filed cannot be sustained. It suffices to say only that the examiner has not discharged his duty of supporting the rejections of the appellant's claims with adequate reasons and factual findings capable of review on appeal.

The rejection of claims 1-24
under 35 U.S.C. § 103 as being
unpatentable over prior art

The appellant has presented three separate arguments, at least one of which identifies error or deficiency in the examiner's rejection.

First, the appellant argues that neither Dunn nor Watkins discloses use of a fixed and limited number of descriptors drawn from an icon library. According to the appellant, Dunn allows icons to be added and the number of icons in the

library varies with the particular application, and Watkins allows the application of any circuit component on a graphical display screen. In our view, the appellant's argument is misplaced. It appears that the appellant has overlooked a very important detail with regard to Dunn, i.e., that there is a distinction between an end user and a methodology designer, and that an end user who is not a methodology designer also uses the system as created by the methodology designer. While it is true that Dunn's system allows the end user who is himself the methodology designer to create a variable number of descriptor icons, an end user who is not the methodology designer has to work with whatever library of descriptor icons that was previously created by the methodology designer and may not himself add to the library. See Dunn from column 3, line 61 to column 4, line 18. Thus, at least in one intended mode or environment of operation, for end users who are not methodology designers, Dunn's system relies on fixed and limited number of usable descriptor icons.

Secondly, the appellant argues that neither Dunn nor Watkins discloses descriptors or icons which depict a digital device solely at the behavioral level. (Be. at 7). In that

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regard, claim 1 specifies that the fixed and limited number of descriptors would "behaviorally describe any digital device to be designed," and claim 11 specifies that a behavioral description of a digital device is constructed by using symbolic icons drawn from the fixed number of such icons contained in the icon library.

While it is true that neither claim 1 nor claim 11 expressly specifies that the description must solely be at the behavioral level, both claims require that a behavioral description for a digital device be provided from the fixed number of icons in the icon library. In light of the appellant's specification from pages 2-4 which set forth what constitutes a behavioral description model and what constitutes a structural description model of a digital device, it is implicit that a behavioral description has a substantially higher level of abstraction and does not include use of lower level structural elements. An illustrative example of such behavioral descriptor icons is shown in appellant's Figure 8.

According to the appellant, the icons shown in Figure 2 of Dunn are lower level structural elements and are not at a

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sufficiently high level of abstraction for providing a behavioral description as is required by the appellant's claims. We agree with the appellant. At least the icons 66, 68, 82, and 84 are structural circuit elements. Icon 66 is an AND gate; icon 68 is an OR gate; icons 82 and 84 are other logical circuits. We disagree with the examiner that these icons are at the "behavioral" level within the context of the appellant's specification. Their presence in the collection of descriptor icons used to design a digital device negates and disqualifies the description as a "behavioral description."

On pages 7-8 of the examiner's answer, the examiner cites to four U.S. Patents which are not any part of the stated ground of rejection. Supposedly, these patents are believed by the examiner as supporting his position that the structural schematic icons in Dunn are properly regarded as behavioral descriptions. But no meaningful explanation has been provided and no specific portion of those references have been identified by the examiner. Just how those references support the examiner's position has not been articulated and we decline to speculate as to what the examiner has in mind.

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Moreover, what is more important is what the appellant's specification regards as a behavioral description as opposed to a structural description. Also, for the purpose evidently intended by the examiner, it is inappropriate not to include these references in the stated ground of rejection. See, e.g., In re Hoch, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970). Accordingly, these references have not been considered.

As a further backup position, the examiner cited to Watkins. (Answer at page 8). Specifically, the examiner referred to column 2, lines 46-63 of Watkins which simply describe in general terms that simulation may be performed at several different levels, i.e., the component-level model which describe the exact behavior of a specific component such as a gate or a transistor, the high level behavioral model which provides a logical or mathematical equation or set of equations describing the behavior of the component, viewed as a "black box", and circuit-level models which comprise a plurality of component-level or behavioral-level models. This does not demonstrate that Dunn's specific gate icons and logic circuit icons are behavioral descriptions.

However, in light of Watkins, it would have been obvious to one with ordinary skill in the art that as an alternative to Dunn's embodiment, it would have been obvious to one with ordinary skill in the art to use solely behavioral icons to describe a digital device. Thus, claim 1 does not distinguish from the prior art combination of Dunn and Watkins on the basis of the behavioral description feature of claim 1. The same, however, cannot be said for claim 11 which additionally requires an icon library having fewer than fifteen icons. The cited portion of Watkins would not have reasonably suggested a purely behavioral-model using fewer than fifteen icons.

Finally, the appellant argues that neither Dunn nor Watkins suggests merging data path information with control path information to create a structural description for a digital device. It should be noted that "data path" and "control path" are specially defined on page 5 of the appellant's specification and are not generic terms which read on anything having to do with data in the case of data path and with control in the case of control path. Claim 1 requires attributes of icons to include both data path and control path information and claim 11 requires merging of data

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path attributes with control path information. With respect to these features of the appellant's claimed invention, the examiner's analysis is conclusory and not supported by adequate rationale and underlying factual determinations. For example, the examiner states (answer at page 8):

[The icons as shown in Fig. 2 of Dunn include both data path and control path information. For instan[ce], icon 76 **should have** data path (data flow) and control path (program flow) to indicate which way data flow in and out of the icon 76. [Emphasis added.]

The above-quoted text reflects not a well reasoned analysis but mere speculation and conjecture.

As a backup position, the examiner states (answer at page 9):

[The state table 318 as shown [in] Watkins et al is known to be a "control information", and paths as disclosed in Watkins et al (e.g., 324, 326, 328) are data paths.

However, "control path" as defined in the appellant's specification is not simply any control information, and "data path" as defined in the appellant's specification is not mere interconnections between components. The examiner has not explained how the state table of Watkins constitutes control path information as is defined by the appellant and how the interconnections 324, 326, and 328 of Watkins constitute data

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paths as defined by the appellant. Furthermore, the examiner has not explained how or whether such data path information and control path information are merged in Watkins or both included in a defined attribute for a descriptor icon. As a whole, the examiner's position is largely disjointed and does not put together a persuasive case for prima facie obviousness. Note further that Dunn and Watkins are separate prior art references and the examiner has not put forth sufficient reasons to combine their teachings insofar as the claim features of data paths and control paths are concerned.

The appellant has also set forth a facially plausible explanation as to why the state table 318 in Watkins is not attributable to any particular icon and why data path and control path information in Watkins do not appear to be merged or both included as an attribute of an icon. With regard to those arguments of the appellant, the examiner has provided no answer. It should also be noted that claim 1 requires the use of a pull-down menu which is activated by icons which have been placed upon a graphical display to define a list of attributes to the icons. No such pull-down menu in the applied prior art has been properly identified by the

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examiner. The examiner states that element 60 in Dunn is a pull-down menu. However, even if element 60 is regarded as a pull-down menu, the menu has not been shown as being activated by any placed descriptor icon and the examiner has not shown how attributes have been defined for the icons by using the pull-down menu.

For the foregoing reasons, the rejection of claims 1-24 as being unpatentable over Dunn and Watkins cannot be sustained.

Conclusion

The rejection of claims 1-24 under 35 U.S.C. § 112, first paragraph, as being without written description in the specification is reversed.

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The rejection of claims 1-24 under 35 U.S.C. § 103 as being unpatentable over Dunn and Watkins is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ERROL A. KRASS)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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