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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MAYANK AGARWAL and
EYAL MADERER

Appeal 2019-003148
Application 15/005,806
Technology Center 2400

Before RICHARD M. LEBOVITZ, JASON V. MORGAN, and
JOHN A. EVANS, *Administrative Patent Judges*.

MORGAN, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

Introduction

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE and enter a NEW GROUND OF REJECTION.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as VMWARE, INC. Appeal Br. 1.

Summary of the Disclosure

Appellant's claimed subject matter relates to an "integrated application-aware load-balancing component . . . incorporated within a distributed application that serves as a control component of multiple physical computers within a distributed computer system." Abstract. The integrated application-aware load-balancing component includes two subcomponents: (1) "a layer-4 load-balancing subcomponent that distributes communications connections initiated by remote client computers among computational nodes within the distributed computer system" and (2) "a layer-7 load-balancing subcomponent that redistributes client requests among cluster nodes within the distributed computer system." *Id.*

Exemplary Claim (Key Limitations Emphasized and Bracketing Added)

1. [1] *An integrated, application-aware load-balancing component of a distributed computer system controlled by a distributed application, the integrated, application-aware load-balancing component comprising:*

[2] *the distributed computer system having multiple computational nodes, each controlled by a local instance of the distributed application that [3] includes a local instance of the integrated, application-aware load-balancing component;*

[4] *a layer-4 load-balancing subcomponent that distributes communications connections initiated by remote processor-controlled client devices to the distributed application among the multiple computational nodes in order to balance the computational load applied to the distributed computer system by the remote processor-controlled client devices; and*

[5] *a layer-7 load-balancing subcomponent that redistributes messages transmitted to the distributed computer system by the remote processor-controlled client devices, directed to the distributed application, and received by one or more of the multiple computational nodes among one or more of the*

multiple computational nodes in order to balance the computational load applied to the distributed computer system by the remote processor-controlled client devices.

The Examiner's rejections and cited references

The Examiner rejects claims 1–4 and 17–20 under 35 U.S.C. § 103 as obvious over Chaudhary et al. (US 2015/0039763 A1; published Feb. 5, 2015) (“Chaudhary”) and Mortsolf et al. (US 2017/0126790 A1; published May 4, 2017) (“Mortsolf”). Final Act. 10–29.

The Examiner rejects claims 5–12 under 35 U.S.C. § 103 as obvious over Chaudhary, Mortsolf, and Gopinath et al. (US 2017/0085622 A1; published Mar. 23, 2017) (“Gopinath”). Final Act. 29–47.

The Examiner rejects claims 13–15 under 35 U.S.C. § 103 as obvious over Chaudhary, Mortsolf, Gopinath, and Goetz et al. (US 2013/0047165 A1; published Feb. 21, 2013) (“Goetz”). Final Act. 47–52.

The Examiner rejects claim 16 under 35 U.S.C. § 103 as obvious over Chaudhary, Mortsolf, Gopinath, and Krause (US 6,047,323; issued Apr. 4, 2000). Final Act. 52–53.

ANALYSIS

In rejecting claim 1 as obvious, the Examiner finds that Chaudhary's high-speed layer 2–7 integrated packet engine 240 teaches [4] “a layer-4 load-balancing subcomponent that distributes communications connections.” Final Act. 11–12 (citing, e.g., Chaudhary ¶¶ 100, 109); Ans. 13–14 (further citing, e.g., Chaudhary ¶ 121, Fig. 2A). The Examiner relies on Mortsolf's hybrid virtual load balancer (HVLB), which can load balance on the Open Systems Interconnection model (OSI) layer 7 to teach [5] “a layer-7 load-balancing subcomponent that redistributes messages.” *Id.* at 13–14 (citing,

e.g., Mortsolf ¶ 19). The Examiner concludes that it would have been obvious to an artisan to combine the teachings of Chaudhary and Mortsolf in the claimed manner to provide “a platform to support load balancing across distributed computer systems at layer-4 and layer-7 to optimize network and application performance.” *Id.* at 15.

Appellant contends the Examiner erred because recitation [5] does not merely recite that the layer-7 load-balancing subcomponent distributes messages. Appeal Br. 30. Rather, recitation [5] uses the term *redistributes*, which Appellant submits “means to distribute again.” *Id.* (citing Spec. ¶¶ 75, 83). Appellant argues that Mortsolf, in contrast “discusses data packets received by a switching flowing to the [HVLB], which forwards the data packets to selected virtual machines.” *Id.* Appellant contends that “[r]eceiving data packets and forwarding data packets is . . . completely unrelated to *redistributing* messages that have been transmitted to a distributed computing system among the computational nodes of the distributed computing system.” *Id.* (emphasis added); Reply Br. 13.

Appellant’s characterization of the claimed invention, particularly the term “redistributes,” accords with the Specification, which discloses that while “layer-4 load-balancing subcomponents 1810–1815 . . . balance communications connections among the nodes . . . layer-7 load-balancing subcomponents 1818–1823 are responsible for a second level of load balancing that involves *redirection of messages received* by a computational node to other computational nodes.” Spec. ¶ 75 (emphasis added), Fig. 18A. This redirection or redistribution is illustrated in the Specification’s “Figure 19 by curved arrows . . . among the computational nodes.” *Id.* ¶ 83. Although not recited in claim 1, the claimed architecture enables

embodiments in which not only can the “[l]ayer-4 load balancing . . . load balance . . . [through] selective distribution of computational nodes to handle incoming connection requests,” but “layer-7 load balancing can [also] continuously rebalance the actual computational loads, even when the message traffic and computational loads generated by the message traffic vary significantly among the active communications connections.” *Id.* This “[l]ayer-7 load balancing can ameliorate computational-load and resource-usage disparities that cannot be predicted and ameliorated by the coarser layer-4 load balancing.” *Id.*

We agree with Appellant that the Examiner’s findings fail to show that Mortsolf teaches or suggests the claimed *redistribution* of messages. Reply Br. 15 (citing Ans. 14). In particular, the Examiner relies on teachings in Mortsolf that relate to the distribution of data packets, but not to the *redistribution* of previously distributed data packets. Mortsolf ¶ 19 (cited in Final Act. 14; Ans. 14–15), Fig. 1. Specifically, Mortsolf teaches that “[d]ata packets received by switch **104** may flow to HVLB **108**,” which “may be configured by policy code . . . to load balance data traffic based on information associated with one or more of the OSI layers contained in received data packets.” Mortsolf ¶ 19. “In accordance with the load balancing decision, HVLB **108** may forward the data packet to one of [virtual machine] **106** via switch **104**.” *Id.*

Mortsolf’s flow of data packets does not represent the distribution and redistribution of data packets or messages, but instead represents an initial distribution of data packets to a virtual machine without any teaching or suggestion of a subsequent *redistribution* of data packets. The Examiner explicitly does not rely on Chaudhary to teach or suggest such redistribution.

Final Act. 13; Ans. 14. Therefore, we agree with Appellant that the Examiner's findings fail to show that the combination of Chaudhary and Mortsolf teaches or suggests disputed recitation [5]. The Examiner also does not show that Gopinath, Goetz, or Krause, individually or in combination, cure this deficiency.

Accordingly, we do not sustain the Examiner's 35 U.S.C. § 103 rejection of claim 1, or the Examiner's 35 U.S.C. § 103 rejections of claims 2–20, which have similar recitations.

Appellant further disputes the Examiner's interpretation of certain recitations of claim 1 under 35 U.S.C. § 112(f). Appeal Br. 10–14; Reply Br. 5–10. The Examiner's error with respect to showing that the prior art teaches or suggests disputed recitation [5] is not based on whether the Examiner improperly applied 35 U.S.C. § 112(f) in interpreting certain claim 1 recitations. Moreover, the Examiner does not make any other rejections (e.g., under 35 U.S.C. § 112(a)) based on the Examiner's use of 35 U.S.C. § 112(f) to interpret certain claim 1 recitations. Final Act. 5–9; Ans. 3–10. Accordingly, we do not reach the non-dispositive dispute as to whether the Examiner properly applied 35 U.S.C. § 112(f) in interpreting certain recitations of claim 1.

NEW GROUNDS OF REJECTION

Although we do not sustain the Examiner's 35 U.S.C. § 103 rejections, pursuant to 37 C.F.R. § 41.50(b), we newly reject claim 1, and claims 2–16 which depend from claim 1, under 35 U.S.C. § 112(a) as not being enabled.

Claim 1 is directed to [1] “[a]n integrated, application-aware load-balancing component comprising” [2] a “distributed computer system having multiple computational nodes,” where each node [3] “includes a local instance of *the integrated, application-aware load-balancing component*” (emphasis added). That is, claim 1 is recited in a circular or recursive manner such that the claimed integrated, application-aware load-balancing component comprises multiple computational nodes that each include integrated, application-aware load balancing component instances which, in turn, each have their own multiple computational nodes. There are no terminal recitations in claim 1 (e.g., an integrated, application-aware load balancing component that does not comprise multiple computational nodes). Thus, claim 1 recites an infinite number of integrated, application-aware load-balancing components and multiple computational nodes.

The Specification does not and cannot enable this infinity of components and computational nodes. Thus, claim 1, and claims 2–16, which depend from claim 1, are invalid for lack of enablement because the scope of the claimed invention “is not reasonably supported by the scope of enablement in the specification.” *MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1384 (Fed. Cir. 2012) (citing *In re Fisher*, 427 F.2d 833, 839 (1970)) (a claim covering changing resistance of an electric insulator from ten-percent to infinity was not enabled).

This deficiency may be remediated by, for example, amending claim 1 to move recitations [2] and [3] out of the body of the claim and into the preamble so that claim 1 is directed to a distributed computer system having multiple computational nodes, each controlled by a local instance of a distributed application that includes an integrated, application-aware load-

balancing component comprising the sub-components represented by recitations [4] and [5].

CONCLUSION

Claims Rejected	35 U.S.C. §	References/ Basis	Affirmed	Reversed	New Ground
1–4, 17–20	103	Chaudhary, Mortsof		1–4, 17–20	
5–12	103	Chaudhary, Mortsof, Gopinath		5–12	
13–15	103	Chaudhary, Mortsof, Gopinath, Goetz		13–15	
16	103	Chaudhary Mortsof, Gopinath, Krause		16	
1–16	112(a)	Enablement			1–16
Overall Outcome				1–20	1–16

TIME PERIOD FOR RESPONSE

No time period for taking subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

37 C.F.R. § 41.50(b) also provides that the Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of

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the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. . . .

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

REVERSED
37 C.F.R. § 41.50(b)