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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* PETER ABEL and HELMUT SPAETH

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Appeal 2012-008285  
Application 11/494,263  
Technology Center 3600

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Before JOHN C. KERINS, EDWARD A. BROWN and TIMOTHY J. GOODSON, *Administrative Patent Judges*.

KERINS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Peter Abel and Helmut Spaeth (Appellants) seek our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1, 2, and 4–20. We have jurisdiction under 35 U.S.C. § 6(b). An oral hearing was conducted on October 5, 2014, with John D. Russell, Esq., appearing on behalf of Appellants. We REVERSE and ENTER A NEW GROUND OF REJECTION UNDER 37 C.F.R. § 41.50(b).

## THE INVENTION

Appellants' invention is directed to a method and system for determining the admissible load capacity of a crane. Independent claim 1 is illustrative:

1. A method for determining the admissible load capacity of a crane, in which the load capacity is determined in dependence on at least one first and one second parameter, the method comprising:

a first step in which the load capacity is determined for a value of the first parameter with different values of the second parameter by calculation or by interpolation or extrapolation on the basis of known values of the load capacity with specific values of the first parameter; and

a second step in which a determination of the load capacity for a value of the second parameter is performed on the basis of values of the load capacity determined in the first step for different values of the second parameter by calculation or by interpolation or extrapolation,

wherein the first and second parameters are parameters which influence the admissible load capacity of the crane, wherein values of the first and second parameters are arbitrarily freely selectable values within a range, wherein the first and second steps are performed by a unit of the crane to determine the admissible load capacity of the crane, and wherein the admissible load capacity of the crane is a load capacity that is safe in operation.

## THE REJECTION

The Examiner has rejected claims 1, 2, and 4–20 under 35 U.S.C. § 103 as being unpatentable over Yoshimatsu (US 6,170,681 B1, issued Jan. 9, 2001) in view of Sanchez (US 3,638,211, issued Jan. 25, 1972).

## ANALYSIS

*Claims 1, 2, and 4–20--35 U.S.C. § 103--Yoshimatsu/Sanchez*

When the method set forth in claim 1 is performed using interpolation, it is, at its essence, executing a bilinear interpolation with two parameters that influence the admissible load capacity of a crane, whose values are arbitrarily freely selectable within a range of values.<sup>1</sup> The import of the parameter values being arbitrary and freely selectable, albeit within prescribed ranges, is that a crane boom may be positioned where values of load capacity for the two pertinent parameters are not known, yet a load capacity at that position can be determined using the claimed process. *See, e.g.,* Appeal Br. 15 (“the calculation of load capacity is not restricted to specific parameters where the capacity is known”).

The Examiner finds that Yoshimatsu discloses that a calculation of an admissible work load can be done by calculation or interpolation, but does not explicitly disclose the exact process of interpolatory calculation. Ans. 5. The Examiner cites to Sanchez as teaching a first step in which the load capacity is determined, by interpolation, for a value of a first parameter with different values of a second parameter. *Id.* at 6. The Examiner acknowledges that Sanchez does not explicitly disclose a second step as claimed. *Id.* The Examiner concludes that it would have been obvious “to have performed a second step of calculating a specific value of a second parameter (e.g. the work radius) based on the result of the first step (load for the specific angle) for the purpose of calculating the value of the load capacity for the specific second parameter.” *Id.* The Examiner further

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<sup>1</sup> *See* [http://en.m.wikipedia.org/wiki/Bilinear\\_interpolation](http://en.m.wikipedia.org/wiki/Bilinear_interpolation), last accessed on November 6, 2014.

concludes that it would have been obvious “to have included the calculation method of Sanchez and used it in the system of Yoshimatsu for the purpose of calculating the load capacity for specific values of the crane.” *Id.* at 7.

Appellants maintain that neither Yoshimatsu nor Sanchez discloses performing a second step as claimed in arriving at an admissible load capacity, and that it would not have been obvious to modify the method resulting from the combined teachings to utilize such a second step. Appeal Br. 16. The control and warning system of Sanchez indeed operates such that the value of only one parameter, i.e., boom angle, is arbitrarily freely selectable within a range, resulting in the need to perform only a single step linear interpolation to determine the admissible load capacity at that boom angle.<sup>2</sup> Sanchez, col. 5, ll. 44–55. Data representing the effect of other parameters, namely, boom length, deployment or nondeployment of outriggers, and swing angle (using quadrants as the applicable units) is permanently stored in a memory unit, and the appropriate data is selected based upon currently sensed values of those parameters. *Id.*, col. 3, ll. 31–39, and col. 4, ll. 4–12.

Notwithstanding Appellants’ assertion that Yoshimatsu’s disclosure of preparing data tables that are stored together as a data map, from which “a middle point is determined by interpolatory calculation,” involves only a single step of interpolation, Yoshimatsu does not clearly evidence whether

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<sup>2</sup> The Examiner appears to find that Sanchez discloses that the values of plural parameters are freely selectable within a range, referencing column 4, lines 60–75, and the mention therein of values  $\theta_1$ ,  $\theta$ ,  $\theta_2$ ,  $S_1$ ,  $S$ , and  $S_2$ . *See* Ans. 6. However, of these parameters, only  $\theta$  is a parameter having a freely selectable value, whereas  $S$  is to be calculated by interpolation and the rest represent known values of maximum stresses at corresponding boom angles. *See* Appeal Br. 19.

only one or more than one step of interpolation is performed. In this regard, Yoshimatsu does not characterize the interpolation as “an” interpolatory calculation or suggest in any other manner whether one step or more than one step is performed.

Neither Appellants’ position nor the Examiner’s position is particularly enlightening on this point. Appellants point to the disclosure in Yoshimatsu that “only the rated load  $W_o$  corresponding to the current swing angle  $\theta$  and work radius  $R$  may be calculated every moment” as standing for the proposition that “it is not possible to additionally calculate the rated load at second values of these parameters.” Appeal Br. 18. Appellants maintain that this constitutes an explicit teaching away from using any calculation method twice in the manner claimed. *Id.* Appellants do not make clear the relevance of not being able to calculate the rated loads at second values of swing angle and work radius. What does appear to be relevant is whether or not Yoshimatsu’s data map and data tables contain data for the *current* values of swing angle and work radius. If data related to one of these is present, then only a single step of interpolation is necessary to determine the rated load  $W_o$  based on the value for the other parameter, much in the same manner as the approach used in Sanchez. However, if no data exists for either the current swing angle or work radius, it would not be possible to determine the rated load  $W_o$  in a single step of interpolation. Instead, it appears that resort would be had to a bilinear interpolation approach, were interpolation used exclusively, or possibly some other, different approach that might or might not include an interpolation step.

The Examiner takes the position that one of ordinary skill in the art “would clearly realize that there are indeed multiple steps to calculate the

rated work load and nowhere in Yoshimatsu does it say that only ONE step is required to perform the calculation of a load capacity of the crane.” Ans.

14. The Examiner further reasons that:

Yoshimatsu discloses of two methods of calculating the load capacity. The first method is through a strict mathematical expression (**the relation among R, .theta. and W may be stored in terms of a functional expression.**”), and of an interpolatory calculation method (“According to another method, the work radius R for each unit swing angle (say 1.degree.[”]) proportional to work conditions such as boom length LB and outrigger jack protrusion quantity is tabulated as a data table, then plural such tables are stored together as a data map *[arbitrary freely selectable values since using the data from the table we can, using interpolation calculate for the load capacity of an unknown angle and an unknown work radius R]*, and a middle point is determined by interpolatory calculation. . . . Thus clearly multiple steps would clearly be required to determine the load capacity of the crane not just ONE step.

*Id.* (emphasis added).

The italicized passage in the above quote does not accurately represent any specific disclosure in Yoshimatsu. As we have noted above in discussing Appellants’ position, Yoshimatsu fails to make clear whether there might be only one, or more than one, parameter for which the value would be arbitrary and freely selectable.<sup>3</sup> It is possible, for example, that the tabulation of work radius R proportional to work conditions such as boom

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<sup>3</sup> And, as noted previously, the Examiner, at least initially, was relying on Sanchez as disclosing a plurality of parameters whose values were arbitrary and freely selectable. *See* fn. 2, *supra*.

length and outrigger jack protrusion quantity “for each unit swing angle (say  $1^\circ$ )” effectively removes the swing angle from the realm of parameters whose value is arbitrary and freely selectable, or for which there may be no data at particular values. In other words, the incremental unit selected for the swing angle, in a manner similar to the selection of quadrants in Sanchez, may be deemed appropriate to provide reliable data regardless of the exact swing angle such that a rated load  $W_0$  can be determined for a particular work radius  $R$  in a single interpolation step. On the other hand, the interpolatory calculation contemplated by Yoshimatsu could include interpolation at swing angle values between the known swing angle values as well as interpolation between known work radii. Since it would be speculative to find that the latter was intended by Yoshimatsu, the preponderance of the evidence does not support a finding that Yoshimatsu necessarily employs successive interpolation steps as set forth in claim 1.

We thus view the proper obviousness analysis to be whether a person of ordinary skill in the art, when considering the teachings of Yoshimatsu and Sanchez, would have found it obvious to design a system that would allow operation of a crane in circumstances in which values for two different parameters affecting load capacity would have to be determined by calculation, interpolation, or extrapolation.<sup>4</sup> Sanchez notes that its system, which is specifically designed to require determination of the value of only one parameter (boom angle) prior to finding maximum stress (admissible

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<sup>4</sup> We note, in this regard, that while the prosecution of the application has focused on whether the prior art renders obvious a method employing two interpolation steps, claim 1 allows, for example, for the possibility of employing two calculation steps, as well as performing one step as a calculation and the other step as an interpolation or extrapolation.



load capacity), results in “control and process circuitry [that is] greatly simplified” while still providing information “quickly to the alarm device.” Sanchez, col. 5, ll. 50–55. For its part, Yoshimatsu discloses that, when it comes to actually controlling a crane, the shorter time required to make the necessary calculation using interpolatory calculation is preferred over the longer time required to perform the calculation using the functional expression approach. Yoshimatsu, col. 9, ll. 8–13. Given that speed in providing the needed results is of importance in both references, the preponderance of the evidence does not support a conclusion that it would have been obvious to perform the method in Yoshimatsu with first and second successive interpolation steps, as the Examiner maintains.

Accordingly, the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Yoshimatsu in view of Sanchez is not sustained. Claims 2 and 4–20 either depend from claim 1 or are independent claims having the same limitations found in claim 1 and discussed above. The rejection of those claims as being unpatentable over Yoshimatsu and Sanchez is also not sustained.

*Claim 12—NEW GROUND OF REJECTION—35 U.S.C. §112, ¶2*

Claim 12 depends from claim 1 and recites that, “when a parameter limit is exceeded, another parameter value is set, which provides a lower load capacity, instead of the value measured by a sensor.” Claim 1 requires that “values of the first and second parameters are arbitrarily freely selectable values within a range.” Appeal Br. 32.

Claim 1 provides no indication that any parameter value is measured by a sensor, only that values are arbitrarily and freely selectable. Claim 12 is thus indefinite on the basis that it is unclear what “the value measured by a

sensor” refers to. Further, if the parameter values are selectable only within a particular range, as recited in claim 1, it would appear that the “parameter limit” recited in claim 12 would be the upper or lower limit of the range. Claim 12, however, does not make clear how a value would be selected within that range, and also at the same time fall outside the upper or lower limit of the range.

Alternatively, if the recited parameter limit or limits are not coextensive with the upper and/or lower limits of the recited range, but are somehow within the recited range, the rejection of the actual value in favor of some other value correlating to a lower load capacity required by claim 12 appears to be in conflict with the recitation in claim 1 that the values employed in the first and second steps of the process are arbitrarily and freely selectable within the prescribed range. In other words, if values within the recited range can be overridden by some limit imposed within the range, then those values within the range that exceed the limit are not arbitrarily and freely selectable for use in the first and/or second recited step of the method.

For the foregoing reasons, claim 12 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as Appellants’ invention. This is a NEW GROUND OF REJECTION pursuant to our authority under 37 C.F.R. § 41.50(b).

#### DECISION

The rejection of claims 1, 2 and 4–20 under 35 U.S.C. § 103(a) as being unpatentable over Yoshimatsu in view of Sanchez is REVERSED.

Claim 12 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim that which Appellants regard as the invention. This rejection is a NEW GROUND OF REJECTION pursuant to our authority under 37 C.F.R. § 41.50(b).

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new grounds 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 proceeding 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. . . .

No time period for taking any 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).

REVERSED; 37 C.F.R. § 41.50(b)

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