

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KURT M. MUSIAL and JOHN T. MEAD

Appeal 2007-4345
Application 10/199,657
Technology Center 3600

Decided: January 24, 2008

Before MURRIEL E. CRAWFORD, JENNIFER D. BAHR, and
JOSEPH A. FISCHETTI, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Kurt M. Musial et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 2-10, 12-27, 38-44, and 47. Claims 1, 11, 28-37, 45-46, and 48-50 have been canceled. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellants' invention is directed toward a ground power unit (GPU) used to supply electrical power to an aircraft on the ground. The ground power unit 12 includes a power generator that has a power cable 16 connected to an underside of the aircraft 14 at power connector assemblies 18 and 20 (Spec. 3, ll. 3-7 and fig. 1). The power connector assemblies 18 and 20 have power connector ends 38 and 40, that are engageable with connector receptacles 42 and 44 (Spec. 4, ll. 13-15 and fig. 3), and a rotatable structure 62. As the ground power unit 12 or the aircraft 14 moves, a tension 64 develops in the power cable 16. The rotatable structure 62 responds to the tension 64 by aligning the connector assemblies 42 and 44 with the longitudinal axis 66 of the power cable 16. Upon alignment, the power connector ends 38 and 40 are automatically released from the connector receptacles 42 and 44 (Spec. 5, ll. 12-18 and fig. 4).

Claim 8 is illustrative of the claimed invention and reads as follows:

8. A ground power system for an aircraft, comprising:

a ground power source;

a power cable coupleable with the aircraft and the ground power source; and

a tension-activated release coupling that is automatically releasable with sufficient tension in the power cable between the aircraft and the ground power source, wherein the tension-activated release coupling comprises a rotatable mount adapted to align a release direction of the tension-activated release coupling with a direction of the sufficient tension.

THE REJECTIONS

The Examiner relies upon the following references as evidence of unpatentability:

Sargent	US 6,424,891 B1	Jul. 23, 2002
Enriquez, Sr.	US 6,544,069 B1	Apr. 8, 2003

The Examiner relies upon the following Internet websites for informational purposes only:

www.marchansen.com/tn102 (hereafter “NEMA Standards”);
www.osha.gov/SLTC/healthguidelines/nitrogen/recognition.html
(hereafter “Nitrogen Standards”).

Appellants seek review of the Examiner’s rejections of claims 2-10, 12-27, 38-44, and 47 under 35 U.S.C. §103(a) as unpatentable over Sargent in view of Enriquez.

The Examiner provides reasoning in support of the rejections in the Answer (mailed March 31, 2006). Appellants present opposing arguments in the Appeal Brief (filed September 14, 2005) and Reply Brief (filed January 9, 2006).

FACTS

Sargent

We make the following findings of fact with respect to Sargent:

1. Sargent teaches an aircraft ground power unit (AGPU 10) including a ground power source (prime mover 110 and AC generator 160), electrical connectors 245 for AC and DC current (col. 6, ll. 32-35 and fig. 4), electrical cables 280 and 285 coupled to the aircraft and the

- AGPU (col. 6, ll. 28-30 and fig. 3), and a tension-activated release coupling (right-hand arrow of 245 in fig. 4).
2. The aircraft ground power unit of Sargent also includes a nitrogen supply tank 140 that uses a quick-disconnect coupling (col. 5, ll. 13-17 and fig. 3).
 3. Sargent does not teach a rotatable mount adapted to align a release direction of the tension-activated release coupling with a direction of the sufficient tension.
 4. The electrical outlets of Sargent are NEMA 5-15 rigid-type outlets (right-hand arrow of 245 in fig. 4).

Enriquez

We make the following findings of fact with respect to Enriquez:

5. Enriquez teaches a swivel outlet (rotatable mount) for medium-duty and heavy-duty electrical loads (col. 1, ll. 65-67) in residences and in equipment (col. 1, ll. 10-12).
6. The swivel outlet of Enriquez allows a user to safely remove an electrical plug (release coupling) from an electrical outlet by pulling on the electrical cable (automatically releasable with sufficient tension in the power cable) such that the outlet 20 swivels in the direction from which the electrical cable is pulled (rotatable mount adapted to align a release direction of the tension-activated release coupling with a direction of the sufficient tension) (col. 1, ll. 50-55; col. 5, ll. 27-32; and fig. 4).

7. A fixed-type electrical outlet is damaged when the electrical cord is pulled from the outlet with a force in a direction not perpendicular to the receptacles (col. 1, ll. 14-19).
8. The rigid-type and the swivel-type electrical outlets of Enriquez are NEMA 5-15 outlets (fig. 5).

OPINION

Appellants argue the rejection under 35 U.S.C. §103(a) of independent claims 8, 15, 16, 20, 38, 44, and 47 separately (App. Br. 15-22). Therefore, we will address Appellants' arguments with regard to claims 8, 15, 16, 20, 38, 44, and 47 separately. Because Appellants have not argued the dependent claims separately from the independent claims from which they depend, claims 2-7, 9-10, 12-14, 17-19, 21-27, and 39-43 stand or fall with independent claims 8, 15, 16, 20, 38, 44, and 47, respectively.

The issue presented in this appeal is whether Appellants have demonstrated that the Examiner erred in determining that the subject matter of claims 2-10, 12-27, 38-44, and 47 is unpatentable over Sargent in view of Enriquez. This issue turns on whether it would have been obvious to combine Sargent and Enriquez as proposed by the Examiner and, if so, whether the combination of Sargent and Enriquez proposed by the Examiner would result in the claimed invention.

Appellants argue that Enriquez is non-analogous art (App. Br. 24).

The analogous-art test requires that the Board show that a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection. *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992). References are selected as being

reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. *Id.* (“[I]t is necessary to consider ‘the reality of the circumstances,’ -in other words, common sense-in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.” (quoting *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979))).

In re Kahn, 441 F.3d 977, 986-87 (Fed. Cir. 2006). Appellants define the problem to be solved by the invention as “preventing aircraft damage due to a failure of a cable to disconnect between the aircraft and a ground power unit” (App. Br. 24). We disagree with this characterization. The general problem facing Appellants was preventing damage to an electrical outlet or power unit when a cable connected to such outlet or power unit is pulled in a direction that is not aligned with the release direction (Spec. 1:10-19). As such, we find that the teachings of Enriquez are “reasonably pertinent to the particular problem with which the inventor was concerned.” *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992). That is, Enriquez teaches using a swivel outlet to prevent damage to an electrical outlet when pulling the cable with an existing tension that is not aligned with a release direction, i.e., the direction perpendicular to the outlet face (Findings of Fact 6 and 7). Therefore, the teachings of Enriquez are reasonably pertinent to the problem the Appellants were trying to solve, and is thus analogous art. Moreover, “[u]nder the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *KSR Int’l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007). In this instance, Enriquez addresses the need to prevent damage to the outlet when a cable is pulled

from the outlet by a tension force that is not aligned with the release direction, a need known in the field of endeavor (Spec. 1:10-19).

Appellants further argue that the combination of Sargent and Enriquez is improper because “the features of the electrical outlet of the Enriquez reference would render the electrical connectors 245 of the Sargent reference unsatisfactory for their intended purpose” (App. Br. 22-24 and Reply Br. 4-6). Specifically, Appellants argue that (1) the outlet of Enriquez is configured for residential electrical requirements, whereas the outlet of Sargent is for aircraft electrical requirements (App. Br. 22-23), and (2) the outlet ball structure of Enriquez is not workable with the outlet of Sargent because, according to Appellants, the references do not teach or suggest how the outlet ball structure (fig. 3a of Enriquez) can be installed within the outlet structure of Sargent (App. Br. 23-24).

We disagree with Appellants’ first point because Enriquez specifically teaches a swivel outlet (rotatable mount) for medium-duty and heavy-duty electrical loads in residences and in equipment (Finding of Fact 5). Upon reviewing the NEMA Standards provided by the Examiner, and comparing the outlets of Sargent and Enriquez, we agree with the Examiner that one ordinarily skilled in the art would recognize that the outlets of Sargent and Enriquez are NEMA 5-15 outlets (Findings of Fact 4 and 8) and as such have essentially identical power requirements. Appellants’ argument that an aircraft could never be coupled to the residential outlet of Enriquez (App. Br. 14) is not persuasive because Appellant has not provided any evidence to sustain such a statement, whereas the Examiner has shown that the outlets of Sargent and Enriquez are interchangeable (Ans. 4-5, 8 and 11).

Furthermore, the swivel outlet of Enriquez prevents damage to an electrical cable when the cable is released by tension that is not aligned with the release direction (Finding of Fact 6). A person of ordinary skill in the art would immediately appreciate that such an outlet would provide the same benefit to the Sargent ground power unit, thereby preventing damage to the electrical cable when the cable is released by tension that is not aligned with the release direction. Moreover, Appellants have not alleged, much less shown, that modification of Sargent to provide such a swivel outlet would have been beyond the skill of a person of ordinary skill in the art.

With respect to Appellants' second point, Appellants contend that the ball structure is too large to fit behind the panel 190 of Sargent and that the resulting tension in the electrical cables would pull the ball structure from the panel, thereby damaging the electrical connectors. These arguments appear to be speculative at best. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 127 S. Ct. at 1742. If the outlets of Sargent and Enriquez have essentially similar power requirements, we conclude that the person ordinarily skilled in the art has the knowledge to make adjustments to the outlet of Sargent in view of Enriquez such that the ball structure would fit (see figs. 3a and 3b of Enriquez showing a housing 60 for holding the ball structure) and, at the same time, would resist the resulting tension in the cable. Finally, we note that because the outlet of Enriquez is a tension-activated release outlet, a person of ordinary skill in the art would reasonably infer that the outlet of Sargent in view of Enriquez would also resist an applied tension load.

Claims 8 and 20

With respect to claims 8 and 20, Appellants first argue that neither Sargent nor Enriquez teaches a “tension-activated release coupling that is automatically releasable with sufficient tension in the power cable between the aircraft and the ground power source” (App. Br. 9-15). Appellants’ arguments appear to be drawn against the references individually. Nonobviousness cannot be established by attacking the references individually when the rejection is predicated upon a combination of prior art disclosures. *See In re Merck & Co. Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). That is, Sargent teaches a rigid-type electrical outlet for an aircraft ground power unit (Finding of Fact 4). Enriquez teaches that a rigid-type electrical outlet is damaged when the electrical cord is pulled from the outlet with a force in a direction not perpendicular to the receptacles (Finding of Fact 7). Hence, the outlet of Enriquez includes a tension-activated release coupling. As previously stated, we agree with the Examiner that one ordinarily skilled in the art would recognize that the outlets of Sargent and Enriquez are NEMA 5-15 outlets (Findings of Fact 4 and 8). Therefore, because the outlets of Sargent and Enriquez are of the same type and have a similar electrical configuration, we find that Sargent teaches a “tension-activated release coupling.”

Appellants then contend that Sargent does not teach (1) a tension-activated quick-disconnect coupling for the electrical cables (App. Br. 10-12); (2) cables between the aircraft and the ground power unit (App. Br. 12); and (3) an aircraft (App. Br. 12). It is elementary that to support an obviousness rejection, all of the claim limitations must be taught or suggested by the prior art applied (*see In re Royka*, 490 F.2d 981, 984-85

(CCPA 1974)) and that all words in a claim must be considered in judging the patentability of that claim against the prior art (*In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970)). Here, we disagree with Appellants on all counts because Sargent specifically teaches an aircraft ground power unit that provides electrical inputs to an aircraft (Finding of Fact 1). As such, because the AGPU system of Sargent provides electrical power to an aircraft the AGPU system must have cables connecting the AGPU to the aircraft and it must include an aircraft in order to function as described.

Appellants further argue that a tension-activated release coupling would be unworkable and hazardous with the outlet of Sargent because a spark may be created when electrical coupling 245 is released and the neighboring nitrogen will create combustion (App. Br. 12-13). We find Appellants argument unpersuasive. After reviewing the Nitrogen Standards provided by the Examiner, we agree that nitrogen is a non-combustible gas, specifically an inert gas, and as such a spark cannot create combustion.

Finally with respect to the teachings of Sargent, Appellants note that tension does not develop between the aircraft and the ground power source but rather between a user's hand and the couplings (App. Br. 12). Once again, Appellants appear to be arguing against the references individually. We disagree with Appellants' position because the outlet of Sargent as modified by Enriquez allows for tension to develop between a "user," situated at a distance from the outlet, and pulling on the electrical cable. That is, the "user" is the "aircraft" which is pulling on the electrical cable (Ans. 10).

For the foregoing reasons, Appellants' arguments do not persuade us the Examiner erred in rejecting claims 8 and 20 as unpatentable over Sargent in view of Enriquez. The rejection of claims 8 and 20 is sustained.

Claims 15, 16, 38, 44, and 47

Appellants argue that neither Sargent nor Enriquez teaches that the “automatic release” is triggered by tension in the power cable resulting from motion between the aircraft and the ground power source (App. Br. 15-22). We disagree because this limitation appears to be a functional limitation. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78 (Fed. Cir. 1997). “[A]pparatus claims cover what a device is, not what a device does.” *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990). Therefore, as long as tension is generated between the aircraft and the ground power system, the coupling of Sargent in view of Enriquez will release automatically. Furthermore, the outlet of Sargent as modified by Enriquez allows for tension to develop between a “user,” situated at a distance from the outlet, and pulling on the electrical cable. That is, the “user” is the “aircraft” which is pulling on the electrical cable (Ans. 10). Therefore, the rejection of claims 15, 16, 38, 44, and 47 is sustained.

Appeal 2007-4345
Application 10/199,657

SUMMARY

The decision of the Examiner to reject claims 2-10, 12-27, 38-44, and 47 is affirmed.

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) (2006).

AFFIRMED

vsh

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