UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRUCE JEROME SOLDBERG and DAVID KENT MATTHEIS

Appeal 2007-4396
Application 10/461,321
Technology Center 3600

Decided: August 27, 2008

Before WILLIAM F. PATE, III, JENNIFER D. BAHR, and JOSEPH A. FISCHETTI, *Administrative Patent Judges*.

PATE, III, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal from the final rejection of claims 1-18. These are the only claims in the application. We have jurisdiction under 35 U.S.C. §§ 134 and 6(b) (2002).

The claimed invention is directed to a method and apparatus for unwinding a roll of web material while controlling the tension therein.

Claim 1, reproduced below, is further illustrative of the claimed subject matter:

> 1. A method of unwinding a roll of web material, the method comprising steps of:
> a) rotating the roll to unwind the web material at a web material speed,
> b) routing the web material around a perforated air conveyance, whereby the machine direction of motion of the web material is altered,
> c) measuring a web-tension analog value for the web material according to a force acting upon a tension-sensing element said tension-sensing element being responsive to a boundary layer of air proximate to said web material as said web material passes proximate to said tension sensing element,
> d) adjusting the speed of the web material according to the web-tension analog value, and
> e) routing the web material to a downstream process.

The references of record relied upon by the Examiner as evidence of obviousness are:

Rantala	US 5,052,233	Oct. 1, 1991
Rogers	US 5,709,352	Jan. 20, 1998
McGary	US 6,328,852 B1	Dec. 11, 2001

Claims 1-8 stand rejected under 35 U.S.C. § 103 as unpatentable over McGary in view of Rantala.

Claims 9-18 stand rejected under 35 U.S.C. § 103 as unpatentable over McGary in view of Rantala and further in view of Rogers. A rejection of claim 12 under 35 U.S.C. § 112, second paragraph, was withdrawn by the Examiner in the Advisory Action dated January 31, 2006.

FINDINGS OF FACT

McGary discloses a method and apparatus for improving the stability of a moving web when transported at high speed wherein the web comprises material of low tensile strength such as tissue paper. (McGary, col. 1, ll. 8-21.) Thus, McGary's invention is directed to the stabilization of a high speed tissue web at least partially through the use of airfoils 18. (McGary, col. 4, ll. 43-47.) As McGary makes clear in column 1, starting at line 37 and continuing through line 46, the term airfoil as used in the McGary Patent includes active airfoils in which compressed air is used to enhance the airfoil's natural ability to stabilize the moving web. Thus, while the preferred embodiment of McGary is described as using airfoils which are passive and are designed to decrease the size of the boundary layer between the web and the airfoil (McGary, col. 6, ll. 51-61), McGary teaches that it is known in the art to use active airfoils which maintain a boundary layer to stabilize a moving web.

Rantala is directed to a method for measuring the tension in a moving web. According to Rantala, when a web of paper is conveyed from one roll to another, the rotation speeds and the rotating torque of the rolls must be controlled in proper relation to one another because the diameter of the rotating rolls is linearly related to the tangential speed at the roll perimeter. (Rantala, col. 1, ll. 11-16.) Thus, according to Rantala, the web tension must be constantly measured during the wind/unwind operation and the rotation speed adjusted according to the measured tension. (Rantala, col. 1, ll. 21-25.) Thus, Rantala teaches the method of controlling the winding and unwinding speed based on measuring the web tension of the material.

The exact measuring device of Rantala utilizes a gauging bar 1 with a linear array of measurement points 3 which are holes drilled through the bar which connect with independent pressure transducers 2. These transducers communicate with the air cushion formed between the moving web and the gauging bar 1. (See, generally, Rantala col. 2, l. 54 – col. 3, l. 36.) The analog pressure that is sensed by the transducers is converted to a digital signal which is communicated to computer system 6. This web tension is communicated from the computer 6 to the system operator so that the rotation speed of the rolls can be adjusted according to the measured tension. (Rantala, col. 3, l. 49-53, and col. 1, ll. 22-25.)

It is our further finding that the air cushion between an object and the moving web described in Rantala is the same as the boundary layer disclosed in McGary and as such is well known in the art. To this end, we note that Appellant discloses that perforated air conveyances such as air bar 200 disclosed in Appellant's Specification are "well known in the art of web handling." (Specification, 3:7-8.) We further find that Rantala, when it discusses wind/unwind operations, in, for example, line 23 of column 1, comprehends the presence of wind and unwind stands, as such stands would be necessary to wind and unwind a web of materials.

With respect to wind and unwind stands, the Examiner has cited Rogers as disclosing such wind and unwind stands for transport and winding and unwinding of paper tissues and other gossamer web materials. Specifically, Rogers discloses a controller 34 which correlates the unwinding speed of bobbin 16 with the take-up speed of the web handling apparatus. See column 3, lines 33-45.

ISSUE

The sole issue for our consideration is the obviousness of claims 1-18. Appellant's argument is based on the disclosure of the principal embodiment of McGary which Appellant argues is inimical to the teaching of Rantala and the claimed use of perforated air conveyances to guide the web of material.

PRINCIPLES OF LAW

A claimed invention is unpatentable if the differences between it and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (2000); *KSR Int'l v. Teleflex Inc*., 127 S.Ct. 1727, 1729-30 (2007); *Graham v. John Deere Co*., 383 U.S. 1, 13-14 (1966).

In *Graham*, the Court held that that the obviousness analysis is bottomed on several basic factual inquiries: "[(1)] the scope and content of the prior art are to be determined; [(2)] differences between the prior art and the claims at issue are to be ascertained; and [(3)] the level of ordinary skill in the pertinent art resolved." 383 U.S. at 17. *See also KSR* at 1734. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id*, at 1739.

While there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR* 127 S.Ct. at 1741.

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id., at 1740. We must "ask whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.*

Appellants argue that there is no teaching, suggestion, or motivation (TSM) for the combination of references. However, in *KSR* the Supreme Court held that a rigid application of such a mandatory formula as TSM was incompatible with its precedent concerning obviousness. *See KSR* at 1741.

A reference is not limited to its preferred embodiment, but must be evaluated for all of its teachings, including its teachings of non-preferred embodiments. *In re Burckel*, 592 F.2d 1175, 1179 (CCPA 1979).

ANALYSIS

Appellant argues that using a boundary layer tension measuring device as disclosed in Rantala is inimical to the disclosure of McGary in that McGary teaches that the boundary layer should be removed. We acknowledge that McGary, in the description of the preferred embodiment, discusses removing the boundary layer between airfoils and the moving web.

However, Appellant does not acknowledge or discuss the portion of the McGary disclosure that the Examiner is relying on. McGary clearly states that the prior art recognizes the use of active airfoils in guiding and directing a web in industrial processing. Thus, McGary is a disclosure of a recognition in the art of the use of such active airfoils in the processing of moving webs, and we agree with the Examiner that the use of active airfoils in the process of Rantala would have been obvious to one of ordinary skill in the web processing art. We further note Appellant's admission in the Specification that perforated air conveyances are well known in this art. Thus, while McGary's preferred embodiment may be directed to airfoils that eliminate the boundary layer, McGary does acknowledge and state that active airfoils are recognized and used in the art.

As to the combination of the tension measuring device in Rantala, it is clear that the tension measuring device of Rantala that relies on boundary layer or air cushion measurements is a simple substitution for the tension measurement device 24 of McGary. As such, it is seen as merely the substitution of one known element for another that would yield a predictable result. *See KSR* at 1740. Therefore, it is our legal conclusion that the Examiner has established a prima facie case of obviousness of claims 1-8. The rejection of claims 1-8 is sustained.

With respect to claims 9-18, it was our finding that both Rogers and Rantala teach the use of winding and unwinding stands in the processing of web materials. Note that Rogers specifically discloses a data processing system with a controller 34 that adjust the speed of the roll 16 relative to the downstream process, filter maker 12. Accordingly, it is our legal conclusion

that the subject matter of claims 9-18 is also prima facie obvious. Therefore, the rejection of these claims is also sustained.

CONCLUSION

The rejections of claims 1-18 are 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)(1)(iv) (2007).

AFFIRMED

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