UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DIETMAR BAUMANN, DIRK HOFMANN,
HERBERT VOLLERT, WILLI NAGEL, ANDREAS HENKE,
BERTRAM FOITZIK, and BERND GOETZELMANN

Appeal 2008-0834
Application 10/962,435
Technology Center 3600

Decided: August 27, 2008

Before WILLIAM F. PATE III, JENNIFER D. BAHR, and
JOHN C. KERINS, *Administrative Patent Judges*.

WILLIAM F. PATE III, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF CASE

This is an appeal from the final rejection of claims 1-10. These are the only claims in the application.

We have jurisdiction over the appeal pursuant to 35 U.S.C. §§ 6 and 134.

The claimed invention is directed to an electromechanical disk brake which converts a frictional force exerted in braking by the rotating brake disk into a contact pressure that presses the friction brake lining against the brake disk. This feature is often called self-boosting or self-energizing.

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

> 1. An electromechanical self-boosting disk brake, comprising
>
> an electromechanical actuating device (44), with which a friction brake lining (28, 30) can be pressed for braking against a brake disk (20),
>
> a mechanical self-boosting device, which converts a frictional force, exerted in braking by the rotating brake disk on the friction brake lining pressed against it, into a contact pressure that presses the friction brake lining against the brake disk,
>
> a frame caliper (12), the frame caliper (12) having two brake lining holders (14, 16), between which the brake disk (20) is located, and two tie rods (18), which connect the two brake lining holders (14, 16) outside the brake disk (20),
>
> friction brake linings (28, 30) disposed on sides of the brake lining holders (14, 16) oriented toward the brake disk (20); and
>
> means for mounting one of the brake lining holders displaceably along the tie rods (18), so that a spacing of the brake lining holders (14, 16) from one another can be varied.

REFERENCES

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

Warwick	3,800,920	Apr. 02, 1974
Taig	5,161,648	Nov. 10, 1992
Dietrich	US 6,318,513 B1	Nov. 20, 2001

REJECTIONS

Claims 1, 2 and 4-10 stand rejected under 35 U.S.C. § 103 as unpatentable over Warwick in view of Dietrich.

Claim 3 stands rejected under 35 U.S.C. § 103 as unpatentable over Warwick in view of Dietrich as applied to claim 1 and further in view of Taig.

OPINION

We have thoroughly reviewed the rejections on appeal in light of the arguments of the Appellants and the Examiner. As a result of this review, we have reached the conclusion that the subject matter of claims 1-9 on appeal is prima facie obvious from the applied prior art. Therefore, the rejections of claims 1-9 will be sustained. We will not sustain the rejection of claim 10. Our reasons follow.

Warwick shows a hydraulic brake of the disk caliper type having a mechanical self-boosting parking brake combined therein. Warwick discloses a disk 12 with brake disk pads 68 and 172. See column 2, lines 13-22 and column 4, lines 4-7. The service braking in Warwick is actuated hydraulically by piston 50 movable in cylinder 36 which contacts inner

brake pad assembly 60. We note that the brake pad includes a central section 64 bounded on all sides by the peripheral section 62. See column 2, lines 24-39.

Turning to the parking brake of Warwick, the parking brake includes a screw shaft 118 mounted in aperture 120 formed in the cylinder. The screw shaft 118 has an actuating lever 122 secured to its outer end. The actuating lever is actuated by a parking brake cable tensioned by a suitable pedal or lever accessible to the operator of the vehicle. See column 3, lines 5-15. The parking brake has a mechanical self-boosting device which includes end wall 150 having ramps 168 formed therein, and ramps 112 formed in the inboard side of the central shoe section 70. See column 3, lines 49-53; column 2, line 64 - column 3, line 4. Warwick further discloses means for mounting one of the brake line holders 70 displaceably movable along the tie rods 30 so that the distance between the two inner central sections of the pads can be varied. The description of this movement is in column 4, lines 36-63. As the pads wear, the adjuster nut 136 advances, closing the distance between the two central paths to allow the self energizing in parking brake mode to be self adjusting.

Warwick differs from the claimed subject matter in that it does not disclose an electromechanical actuating device for actuating the parking brake. Instead, Warwick uses the mechanical actuation of lever 122 which is moved arcuately to rotate shaft 118. See column 4, lines 10-15. Dietrich has been cited to show an electromechanical motor that can be used in a motor vehicle to move a brake element. It would have been obvious to replace the lever 122 and parking brake cable that rotates screw shaft 118 of

Warwick with an electric motor to rotate shaft 118 as a simple substitution of one known element for another, that is, a motor substituted for a crank and cable, to obtain predictable results. The substitution of one known element for another to obtain predictable results is likely to be obvious. *See KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007).

Appellants argue that Warwick's service brake is hydraulically actuated and Warwick's parking brake is actuated mechanically. According to Appellants, this is a teaching that the service brake should be non-self energizing. While this may or may not be true, we are in agreement with the Examiner that this is of no moment, since claims 1, 5 and 10 are not necessarily directed to a service brake. Therefore, the inclusion of an electromechanical motor to operate the parking brake of Warwick appears to be merely the substitution of one known element for another. While the Examiner does not have to suggest why the substitution of the electromechanical motor of Dietrich would improve the device of Warwick, several possibilities occur to us, including the conversion of the mechanical parking brake system to a brake-by-wire system wherein an actual mechanical connection to initiate braking is not necessary. Furthermore, the inclusion of an electromechanical system would allow the vehicle's central computer to have input on parking brake actuation and release. Claims 2, 4, 8 and 9 have not been separately argued. They fall with claim 1.

Turning to the arguments in Appellants' Reply Brief, Appellants argue that the Examiner reliance on Dietrich is simply hindsight. We disagree. Here again, we see it as a simple substitution of one known actuating element for another in a braking system.

Turning to claim 5, we agree with the Examiner that the brake mechanism of Warwick is automatically adjusted as the brake shoes wear. We construe this to be a means of mounting one of the brake lining holders displaceably along the tie rods (pins 30 in Warwick) so that the spacing of the brake lining holders can be varied. Furthermore, this mechanical wear adjustment device is actually actuated by shaft 118 as it operates to engage the parking brake. Thus the subject matter of claim 5, along with claims 6 and 7, argued therewith, is prima facie obvious over the applied prior art.

Appellants argue, in the penultimate sentence on page 2 of the Reply Brief, that the Examiner has not shown the prior art to be the equivalent of Appellants' structure. A showing of equivalency is not required in a proper obviousness analysis.

With regard to claim 10, we will not sustain the rejection of this claim. We acknowledge the figure on page 7 of the Examiner's Answer. However, even if we could regard the plane drawn on the figure as a plane that actually satisfies Appellants' claimed relationship, we note that the plane is not disposed approximately in the same imaginary plane as the brake disk. Therefore, the rejection of claim 10 is reversed.

Turning to separately argued claim 3, the Examiner has cited Taig to show a synchronous drive for the nuts that adjust a variable-width caliper. Appellants' argument on the bottom of page 20 and page 21 of the main brief appear to deal with whether Taig suggests placing an electromechanical actuator in a disk brake and do not seem to engage the Examiner's citation of the reference to show the adjustment of the nuts on the rods that varies the width of the calipers. Nothing in Appellants'

arguments convinces us of any error in the Examiner's § 103 rejection of this claim.

SUMMARY

The rejections of claims 1-9 are affirmed. The rejection of claim 10 is reversed.

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) (2007).

AFFIRMED-IN-PART

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RONALD E. GREIGG
GREIGG & GREIGG P.L.L.C.
1423 POWHATAN STREET, UNIT ONE
ALEXANDRIA VA 22314