

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte WILFRIED GIERING, ERWIN MICHELS, BENEDIKT OHLIG,
and HERBERT STEINHEUER

Appeal 2007-1005
Application 11/151,142
Technology Center 3600

Decided: February 29, 2008

Before DONALD E. ADAMS, ERIC GRIMES, and JEFFREY N.
FREDMAN, *Administrative Patent Judges*.

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DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a pedal simulation device, which the Examiner has rejected under 35 U.S.C. § 102(b). We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

BACKGROUND

The Specification teaches that “pedal simulation devices are already used in vehicles where an electrohydraulic brake system or an electromotive brake system is uncoupled from the brake force generation by means of a

brake pedal” (Spec. 1). According to the Specification, “[s]uch brake systems are referred to as ‘brake-by-wire’ vehicle brake systems since the actual electrohydraulic or electromotive brake system that produces the braking effect is mechanically uncoupled from the brake pedal that initiates the braking operation” (Spec. 1).

Appellants teach a

pedal simulation device for simulating the reaction behaviour of a pedal, in particular of a brake pedal of a vehicle brake system, comprising a cylinder, a piston disposed displaceably inside the cylinder and coupled to the pedal and delimiting a working chamber inside the cylinder, a resetting element capable of exerting a resetting force on the pedal, and a modelling device, which is fluidically connected to the working chamber, for influencing the reaction behaviour of the pedal. With this pedal simulation device, according to the invention it is provided that, upon an actuation of the pedal, a vacuum builds up in the working chamber.

(Spec. 3.)

The Claims

Claims 1-16 are on appeal. The claimed subject matter is reflected in representative claims 1, 3, and 9, which read as follows:

1. Pedal simulation device for simulating the reaction behaviour of a pedal, in particular of a brake pedal of a vehicle brake system, comprising

- a cylinder,

- a piston disposed displaceably inside the cylinder and coupled to the pedal and delimiting a working chamber inside the cylinder,

- a resetting element capable of exerting a resetting force on the pedal, and

- a modelling device, which is fluidically connected to the working chamber, for influencing the reaction behaviour of the pedal,

wherein, upon an actuation of the pedal, a vacuum builds up in the working chamber.

3. Pedal simulation device according to claim 1, wherein the modelling device connects the working chamber to a fluid reservoir that is separated or separable from the ambient atmosphere.

9. Pedal simulation device according to claim 1, wherein the cylinder is closed at its end remote from the working chamber and together with the piston encloses a complementary working chamber and that, upon an actuation of the pedal, fluid flows out of the complementary working chamber through the modelling device.

The Issues

The Examiner relies on the following prior art reference to show unpatentability:

Bock et al., EP 771,705 B1, August 31, 1996 (hereafter “Bock”). All citations to Bock’s text are referenced from Appellants’ certified translation; citations to Bock’s figures refer to the original document.

The rejection as presented by the Examiner is as follows:

Claims 1-16 stand rejected under 35 U.S.C. § 102(b), as being anticipated by Bock.

35 U.S.C. § 102(b) over Bock

The Examiner’s position is that Bock teaches the entire claimed structure (Ans. 3). The Examiner notes that “Bock et al. clearly disclose on page 5 lines 1-5 that the fluid used in the pedal damping apparatus can be an

oil as well as air” (Ans. 4). The Examiner therefore reasons that the “use of an oil would require that chamber 28 be sealed from the ambient atmosphere in order to prevent the oil from escaping the cylinder, thus rendering the apparatus useless” (Ans. 4).

Appellants contend “there is no teaching in [Bock] that the chamber 28 of Fig. 1 is sealed off from the surrounding atmosphere” (App. Br. 8). Appellants respond to the Examiner’s reasoning by arguing that the “hypothetical development of any vacuum in the chamber 28 is mere speculation by the Examiner” (App. Br. 8).

In view of these conflicting positions, we frame the issue before us as follows:

Does Bock teach a pedal simulation device comprising a cylinder with a piston which comprises a working chamber where a vacuum builds up in the working chamber upon actuation of the pedal?

Findings of Fact

1. Bock teaches a pedal simulation device since “good simulation is particularly desirable because then there is no need to readapt to operation of an electric braking system” (Bock 2: 1-7; fig. 1).
2. Bock teaches a cavity cylinder 18 (Bock 9: 8; fig. 1).
3. Bock teaches that “the piston rod 20 fastened to the rod 8 is situated and subdivides the cavity cylinder 18 into the chambers 28 and 30” (Bock 8: 12-14; fig. 1).
4. Bock teaches a resetting element where “[o]n completion of the braking operation, i.e. upon removal of the foot force from the foot-operated

plate 4, the cup spring stack 12 relaxes so that the foot-operated plate 4 moves back into its initial position” (Bock 8: 26-30; fig. 1).

5. Bock teaches a modelling device, which is the bore 22, that is connected to chamber 28 where bore 22 fluidically connects chamber 30 to chamber 28 and which influences the reaction behaviour of the pedal (Bock 8: 14-18; figs. 1 and 2).

6. Bock teaches that “gas damping, preferably air damping is used” (Bock 4: 17-18).

7. Bock teaches “[a]lternatively, it is possible to use oil damping, which may as such be of an identical construction to gas damping, wherein the housing, in which the damping is produced, is filled with oil instead of gas” (Bock 5: 1-5).

8. Bock teaches operation of the piston 20 in figure 1 such that when the piston moves, “air is pressed from the chamber 30 into chamber 28, thereby effecting a damping of the brake pedal 2” (Bock 8: 17-19; fig. 1).

9. The instant Specification states in reference to figure 2 that when the piston 136 moves, the “volume of the working chamber 144 is therefore increased, so that a vacuum arises therein” (Spec. 9: 31-32).

Discussion of § 102(b) over Bock

In analyzing claims 1 and 3, we first interpret the meaning of the limitation “wherein, upon an actuation of the pedal, a vacuum builds up in the working chamber” (Claim 1). In interpreting this limitation, we must determine what is meant by the term “vacuum”. The Specification does not

provide a specific definition of the term “vacuum”. However, the Specification does state in reference to figure 2 that when the piston 136 moves, the “volume of the working chamber 144 is therefore increased, so that a vacuum arises therein” (Spec. 9: 31-32). Here the Specification is using the term vacuum to mean a reduction in pressure (since based upon the ideal gas law $PV=nRT$, when the V (volume) increases, all else held constant, the P (pressure) must be reduced). The Specification states that the result of this change is that “the working chamber 144 takes in air from the ambient atmosphere” (Spec. 10: 1). This statement clearly shows that Specification has no requirement for the working chamber to be entirely cut off from the ambient atmosphere in order for a vacuum to form, only that there is some delay which will result in a damping or resistance so that a temporary vacuum condition will exist (*see* Spec.10: 2-11).

We therefore interpret the term “vacuum” as simply requiring a partial reduction in pressure in the chamber. *See, e.g., In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000) (“[D]uring examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.”).

We also need to interpret the term “modelling device” as it is used in claim 1. The Specification does not directly define the term “modelling device”. However, the Specification does state that “the term modelling device is intended to be a generic term for components that may influence the reaction behavior of the pedal, irrespective of whether they are combined in a common assembly group or associated in each case separately with the working chamber or the complementary working chamber” (Spec. 5: 23-27). The Specification is therefore broadly inclusive and any element which

influences the reaction behaviour of the pedal functions as a “modelling device” within the ambit of the Specification.

Claim 1 - § 102(b) over Bock

We find that Bock teaches a pedal simulation device comprising all of the required elements of claim 1 including a movement of a piston to alter the pressure in one chamber of a cylinder relative to a different chamber (*see* FF 1-8). In particular, Bock teaches that “air is pressed from the chamber 30 into chamber 28, thereby effecting a damping of the brake pedal 2” (Bock 8:17-19; fig. 1).

Bock also teaches a bore 22, which fluidly connects a complementary chamber 30 to the working chamber 28 and which influences the reaction behaviour of the pedal. The bore 22 therefore functions as the “modelling device” (*see* FF 5).

We reject Appellants’ argument that Bock does not teach a sealed chamber or that Bock operates in a manner in which no vacuum will be produced (*see* App. Br. 7-8). We note that the translation of Bock states that “gas damping, preferably air damping is used” (Bock 4, ll. 17-18). Bock also teaches “[a]lternatively, it is possible to use oil damping, which may as such be of an identical construction to gas damping, wherein the housing, in which the damping is produced, is filled with oil instead of gas” (Bock 5, ll. 1-5). When Bock states that the housing “is filled with oil instead of gas” (Bock 5: 4-5), a reasonable interpretation of this phrase requires that either a gas or oil is being placed into the housing. If the chamber is filled with oil, we agree with the Examiner that the “use of an oil would require that chamber 28 be sealed from the ambient atmosphere in order to prevent the

oil from escaping the cylinder, thus rendering the apparatus useless” (Ans. 4). Thus, since Bock states that the same construction can be used for either gas damping or oil damping, we agree with the Examiner that it is reasonable to conclude that the cylinder in Bock’s device is sealed (Bock 5:1-5). The court noted “when the PTO shows sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.” *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Appellants have not provided any showing that the apparatus of Bock will not create a vacuum within the scope of Appellant’s claimed invention.

We are also not persuaded by Appellants’ argument regarding the relative size of the chambers in Bock and the current invention (*see* Reply Br. 6). The vacuum requirement in claim 1 does not provide any degree or size of vacuum that must be produced. Relying upon our earlier interpretation of the term “vacuum”, we note that some level of vacuum exists at least temporarily in one chamber of the Bock device after pedal 4 is depressed (FF 6-9). The Specification does not provide any support for a narrower reading (Spec. 9, ll. 31-32). *See, e.g., In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000) (“[D]uring examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.”).

We therefore find that the presence of a damping vacuum is not merely speculation, but is an inherent result of operating the device of Bock (FF 6-9).

Therefore, we conclude that Bock anticipates claim 1.

Claim 3 - § 102(b) over Bock

We also find that claim 3 is also anticipated by Bock. Claim 3 is drawn to the device of claim 1 in which the “modelling device connects the working chamber to a fluid reservoir that is separated or separable from the ambient atmosphere” (claim 3). Consistent with our interpretation of the term “modelling device” above, the Specification notes that the “modelling device” may “be associated in each case separately with the working chamber” (Spec. 5: 26-27). We therefore interpret the bore 22 as functioning as the “modelling device” consistent with our interpretation for claim 1.

This complementary chamber of Bock, which is functioning as a “fluid reservoir” is necessarily “separated” from the ambient atmosphere in order for the same construction to be used with gas or oil (FF 6-7). As we noted previously, when Bock states that the housing “is filled with oil instead of gas” (Bock 5: 4-5), a reasonable interpretation of this phrase requires that oil is being placed into housing of the working and complementary chambers. If the chamber is filled with oil, we agree with the Examiner that the “use of an oil would require that chamber 28 be sealed from the ambient atmosphere in order to prevent the oil from escaping the cylinder, thus rendering the apparatus useless” (Ans. 4). Therefore, when Bock teaches the use of oil in the working and complementary chambers, those chambers are separated from the ambient atmosphere, resulting in the “fluid reservoir”, as interpreted above, necessarily being separated from ambient atmosphere.

For the foregoing reasons, we affirm the rejection of claims 1 and 3 under 35 U.S.C. § 102(b) as being unpatentable over Bock. Claims 2 and 4-8 fall together with claims 1 and 3.

Claim 9 - § 102(b) over Bock

Appellants' argument toward claim 9 is that Bock does not teach a cylinder that "is closed at its end remote from the working chamber and together with the piston encloses a complementary working chamber and that, upon an actuation of the pedal, fluid flows out of the complementary working chamber through the modelling device" (Claim 9). Appellants point out that Bock teaches the flow of air from chamber 30 to chamber 28, so that if chamber 30 is the "working chamber", chamber 28 must be the complementary chamber. Appellants then point out that Bock teaches that air is pressed into chamber 28, arguing that "this arrangement clearly cannot anticipate the claimed structure where fluid flows out of the complementary chamber upon actuation of the pedal" (App. Br. 12).

We do not find Appellants' logic persuasive because Bock discloses the three different elements – a working chamber, a complementary working chamber, and a modelling device – required by claim 9 (*see* FF 5). Consequently, when Bock teaches that air is pressed into chamber 28 from chamber 30, this is the same type of movement as required by claim 9, which is that fluid (or air) flows through bore 22 (which we interpret as the modeling device) from chamber 30. Bock therefore teaches all of the three required elements; where chamber 28 is the working chamber, chamber 30 is the complementary chamber, and bore 22 is the modelling device (FF 5).

We agree with the Examiner's argument that "[u]pon actuation of the pedal the fluid flows from the compl[e]mentary chamber 30 through the modelling device 22, see page 8, lines 14-19" (Ans. 5). Bock teaches a modelling device at page 8, which is bore 22. The Examiner equates the modelling device with the bore 22, and Bock clearly teaches that when the pedal is depressed, the gas or fluid flows from the working chamber 30 into the complementary working chamber 28 via bore 22 (Bock 8: 14-19; fig. 1). Bock's teaching therefore satisfies the requirement of claim 9 that the fluid flows from the complementary working chamber through the modelling device (*see* claim 9). "[A]nticipation requires that all of the elements and limitations of the claim are found within a single prior art reference." *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). The Bock reference teaches a modelling device (bore 22) which operates consistent with the requirements of claim 9 that the fluid flow from the complementary working chamber through the modelling device (FF 5). We therefore conclude that Bock anticipates claim 9.

For the foregoing reasons, we affirm the rejection of claim 9 under 35 U.S.C. § 102(b) as being unpatentable over Bock. The rejection of claims 10-16 are also affirmed in view of the affirmance of claim 9.

SUMMARY

We affirm the rejections of claims 1 and 3 as anticipated by Bock. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the 35 U.S.C. § 102(b) rejection of claims 2 and 4-8, as these claims were not argued separately. We affirm the rejection of claim 9 under 35 U.S.C. § 102(b) as being unpatentable over Bock. Pursuant to 37 C.F.R.

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§ 41.37(c)(1)(vii)(2006), we also affirm the 35 U.S.C. § 102(b) rejection of claims 10-16, as these claims were not argued separately.

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)(2006).

AFFIRMED

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