UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ZF Friedrichshafen AG

Appeal 2008-3905
Application 10/981,169
Technology Center 3600

Decided: November 26, 2008

Before FRED E. McKELVEY, *Senior Administrative Patent Judge* and JAMESON LEE and RICHARD TORCZON, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is a decision on appeal by the real party in interest, ZF Friedrichshafen AG (ZF), under 35 U.S.C. § 134(a) from a final rejection of claims 1, 2, 7, and 11. ZF requests reversal of the Examiner's rejection of those claims. We have jurisdiction under 35 U.S.C. § 6(b).

Reference Relied on by the Examiner

Fenn et al.	2001/0023801	Sep. 27, 2001

The Rejections on Appeal

The Examiner rejected claims 1, 2, 7, and 11 under 35 U.S.C. § 102(b) as anticipated by Fenn et al. (Fenn).

The Invention

The invention relates to a damping valve that enables flow of a damping medium in one direction and blocks the flow in the opposite direction. (Spec. 1:¶ 1.)

Claim 1 is reproduced below (Claims App'x A-1:1-13):

1. A damping valve comprising:

a damping valve body with at least one through channel having an outlet area;

a first cover disk covering the outlet area and having at least one hole;

a nonreturn valve disk supported on the first cover disk and having a clamping surface with at least one notch and a cover area which extends over the at least one hole and is deformable with respect to the clamping surface in a direction away from the first cover disk such that flow of damping medium is enabled in one direction through said at least one hole and flow of damping medium is blocked in the opposite direction through said at least one hole; and

a second cover disk formed as a disk spring which loads the nonreturn valve disk toward the first cover disk, the disk spring and the cover area of the nonreturn valve disk forming a ring-shaped space, the notch forming an outlet connection of the ring-shaped space, wherein the enabled flow of damping medium flows through

the through channel, the at least one hole, the ring-shaped space, and the notch, while the disk spring holds the clamping surface.

B. ISSUES

1) Do Fenn's retaining disk 57 and spring element 59 together form a "disk spring?"

2) Does the relationship between Fenn's clamping surface 49 and recess 53 satisfy the requirement that a clamping surface with at least one notch is held when a damping medium flows through the notch?

3) Does the inner surface of Fenn's changeover disk 31 that defines a rounded opening have a plurality of centering webs that extend radially into that opening?

C. FINDINGS OF FACT

1. Fenn discloses a piston-cylinder unit 1 embodied as a single-tube vibration damper. (Fenn 2: ¶ 22; Figure 1.)

2. In Fenn, the piston-cylinder unit includes a piston 5 with a damping valve 21 that is attached to the end of a piston rod 7. (Fenn 2: ¶24; Figure 1.)

3. In Fenn, when piston rod 7 moves, a flow of damping fluid passes through damping valve 21 between work spaces 11a and 11b. (Fenn 2:¶¶24-26; Figures 1&2.)

4. Fenn's Figure 2 is reproduced below:

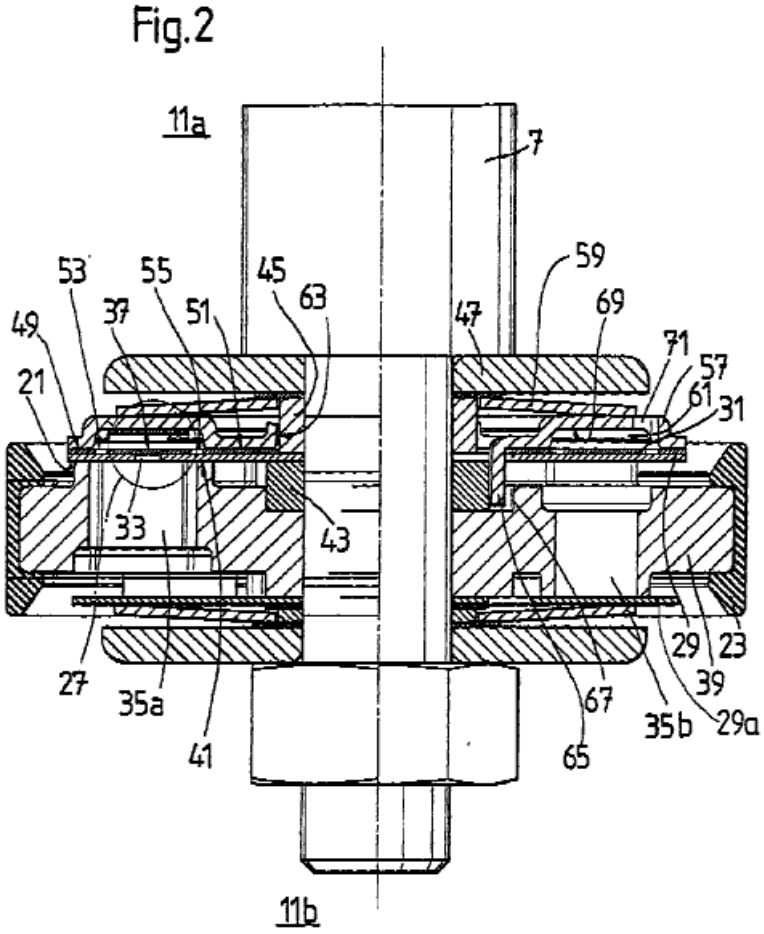


Figure 2 shows a cross-section of a damping valve as a piston. (Fenn 1:¶17.)

5. Fenn's damping valve 21 includes a retaining disk 57 that functions to limit the lift-off movement of a covering surface 37 of a changeover disk 31. (Fenn 2:¶28.)

6. In Fenn, retaining disk 57 is placed on clamping surfaces 49, 51 of changeover disk 31 and then preloaded by spring element 59 toward restrictor disk 29. (Fenn 2:¶28.)

7. In Fenn, due to spring-load of the retaining disk 57, a low pressure flow of damping fluid causes only the covering surface 37 to lift off

the changeover disk 31 creating a passageway for the damping fluid to flow. (Fenn 2:¶¶ 28, 30.)

8. In Fenn, the damping fluid flows into a ring-shaped channel 61 formed between the retaining disk 57 and changeover disk 31 and then into a working space through flow connection 71. (Fenn 2:¶¶ 28, 30.)

9. Fenn discloses that recesses 53 and 55 separate the clamping surfaces 49 and 51 from the covering surface 37. (Fenn 2:¶ 27.)

10. In Fenn, those recesses allow covering surface 37 to lift off restrictor disk 29. (Fenn 2:¶ 27.)

D. PRINCIPLES OF LAW

To establish anticipation under 35 U.S.C. § 102, each and every element in a claim, arranged as is recited in the claim, must be found in a single prior art reference. *Karsten Manufacturing Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

During examination, claim terms are given their broadest reasonable interpretation consistent with the specification. *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989).

E. ANALYSIS

ZF argues claims 1, 2, and 7 collectively. ZF argues claim 11 separately.

Claims 1, 2, and 7

The Examiner rejected claims 1, 2, and 7 as anticipated by Fenn. We focus on the disputed limitations.

ZF first disputes that Fenn satisfies the requirement in claim 1 of (Claims App'x A1:9-11):

> a second cover disk formed as a disk spring, which loads the nonreturn valve disk toward the first cover disk, the disk spring and the cover area of the nonreturn valve disk forming a ring-shaped space.

The Examiner found that in Fenn, spring element 59 and retaining disk 57 together form a disk spring. (Ans. 3:10-12.) The Examiner explained that "[d]isk 57 is loaded by a spring member 59 to bias the non-return valve disk 49." (Ans. 5:3-4.) The Examiner also found that Fenn's channel 61 is a ring-shaped space formed in part by retaining disk 57. (Ans. 4: Annotated copy of Fenn's Figure 2.)

ZF argues that neither of Fenn's retaining disk 57 nor spring element 59 taken individually are properly considered a disk spring. ZF contends that retaining disk 57 is not a disk spring because it requires the operation of the spring member 59 to load the retaining disk 57 against cover surface 37. (App. Br. 6:5-12; Reply Br. 2:1-11.) ZF also contends that spring element 59 does not form a part of a ring-shaped space through which a damping medium flows. According to ZF, any ring-shaped space bounded by spring element 59 does not receive a damping medium flow. (App. Br. 6:16-20; Reply Br. 2:13-3:7.)

Fenn discloses a piston-cylinder unit 1 embodied as a single-tube vibration damper. (Fenn 2: ¶ 22; Figure 1.) The piston-cylinder unit includes a piston 5 with a damping valve 21 that is attached to the end of a piston rod 7. (Fenn 2:¶24; Figure 1.) When piston rod 7 moves, a flow of damping fluid passes through damping valve 21 between work spaces 11a and 11b. (Fenn 2:¶¶24-26; Figures 1&2.)

Fenn's Figure 2 is reproduced below:

Fig.2

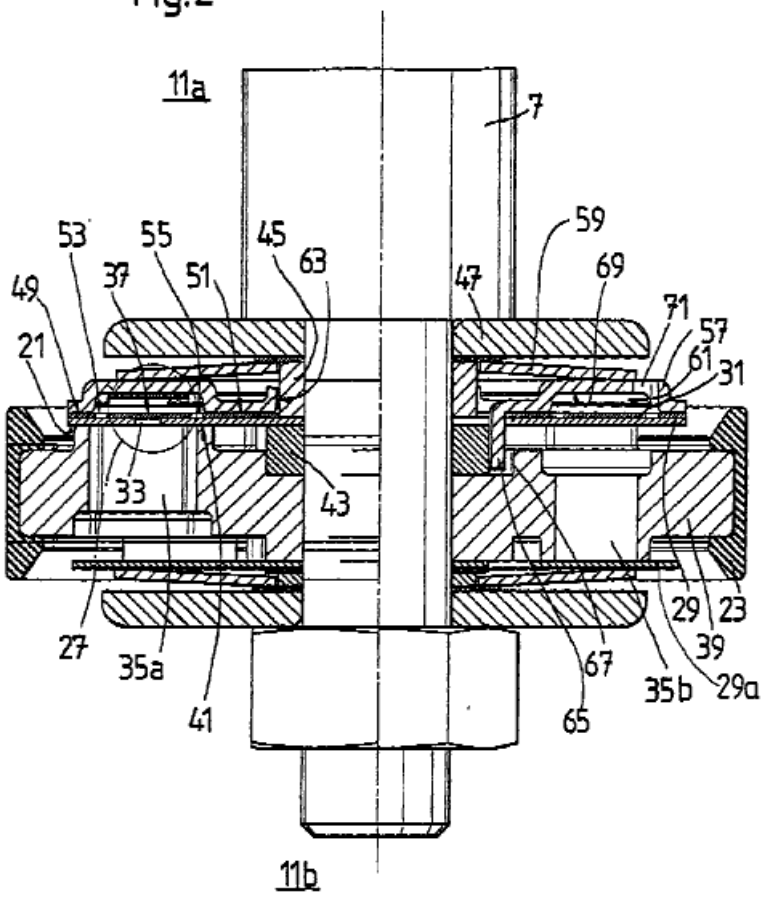


Figure 2 shows a cross-section of a damping valve as a piston. (Fenn 1:¶17.)

Damping valve 21 includes a retaining disk 57 that functions to limit the lift-off movement of a covering surface 37 of a changeover disk 31. (Fenn 2:¶28.) To achieve that function, retaining disk 57 is placed on clamping surfaces 49, 51 of changeover disk 31 and then preloaded by spring element 59 toward restrictor disk 29. (Fenn 2:¶28.) Due to the spring-load of the retaining disk 57, a low pressure flow of damping fluid causes only the covering surface 37 to lift off the changeover disk 31 creating a passageway for the damping fluid to flow. (Fenn 2:¶¶ 28, 30.)

The damping fluid flows into a ring-shaped channel 61 formed between the retaining disk 57 and changeover disk 31 and then into a working space through flow connection 71. (Fenn 2:¶¶ 28, 30.)

Based on the foregoing, the Examiner reasonably determined that Fenn's retaining disk 57 and spring member 59 together satisfy the above-quoted claim limitation. ZF argues only that neither of those elements individually satisfy the spring disk requirement of the claims. ZF does not explain why the retaining disk 57 and spring member 59 do not in combination form the disk spring.

During examination, claim terms are given their broadest reasonable interpretation consistent with the specification. *In re Zletz*, 893 F.2d at 321. Neither ZF's claim nor specification require that a "disk spring" be a structure made up of only a single element. In Fenn, spring member 59 operates to load retaining disk 57 with a spring force. It is not inconsistent with ZF's specification nor unreasonable to regard a spring-loaded disk as a "disk spring." That the spring-loading of the disk is applied by a spring member rather than by intrinsic spring characteristics of the disk is of no moment. We reject ZF's argument that Fenn does not disclose a "disk spring."

ZF also disputes that Fenn satisfies the claim requirement of (Claims App'x A-1:4-13):

> a nonreturn valve disk supported on the first cover disk and having a clamping surface with at least one notch…wherein the enabled flow of damping medium flows through the through channel, the at least one hole, the ring-shaped space, and the notch, while the disk spring holds the clamping surface.

The Examiner found that in Fenn, recess 53 satisfies the notch requirement of claim 1. (Ans. 3:6.)

ZF contends that recess 53 is formed on covering surface 37 of changeover disk 31. (Ans. 7:14-15.) ZF argues that the recess is then disposed adjacent to the clamping surface and is lifted off from the restrictor disk 29 when the covering surface is lifted. (Ans. 7:21-25.) According to ZF, the claim requires a notch that remains stationary when a damping medium flows through it. (Reply Br. 3:13-15.)

ZF's arguments are not convincing. Fenn discloses that recesses 53 and 55 separate the clamping surfaces 49 and 51 from the covering surface 37. The recesses allow covering surface 37 to lift off restrictor disk 29. (Fenn 2:¶ 27.) Recesses 53 and 55 are simply gaps that separate the clamping surfaces 49 and 51 from covering surface 37. Those recesses allow the covering surface to move relative to the clamping surfaces. When covering surface 37 lifts off the restrictor disk 29, the recesses are expanded and operate as gaps that allow the flow of damping fluid into channel 61. The recesses do not move with the covering surface. Rather, the recesses remain associated with their respective clamping surface and simply change shape based on the position of the covering surface.

Moreover, even if recesses 53 and 55 do move with covering surface 37, ZF's claims are not limited to notches that do not move. Claim 1 does not require that the notch be "stationary." Instead, the claim simply requires "a clamping surface with at least one notch" where a "disk spring holds the clamping surface." While the claims require that the clamping surface is held by the disk spring, that is not a requirement that no portion of the clamping surface can move. If recesses 53 and 55 move when covering

surface 37 lifts off, each recess is still associated with its respective clamping surface. The recesses are not part of the covering surface to the exclusion of being part of the clamping surfaces. We reject ZF's argument that Fenn's recess 53 does not satisfy the notch requirement of claim 1.

For all the foregoing reasons, we sustain the rejection of claims 1, 2, and 7 under 35 U.S.C. § 102(b) as anticipated by Fenn.

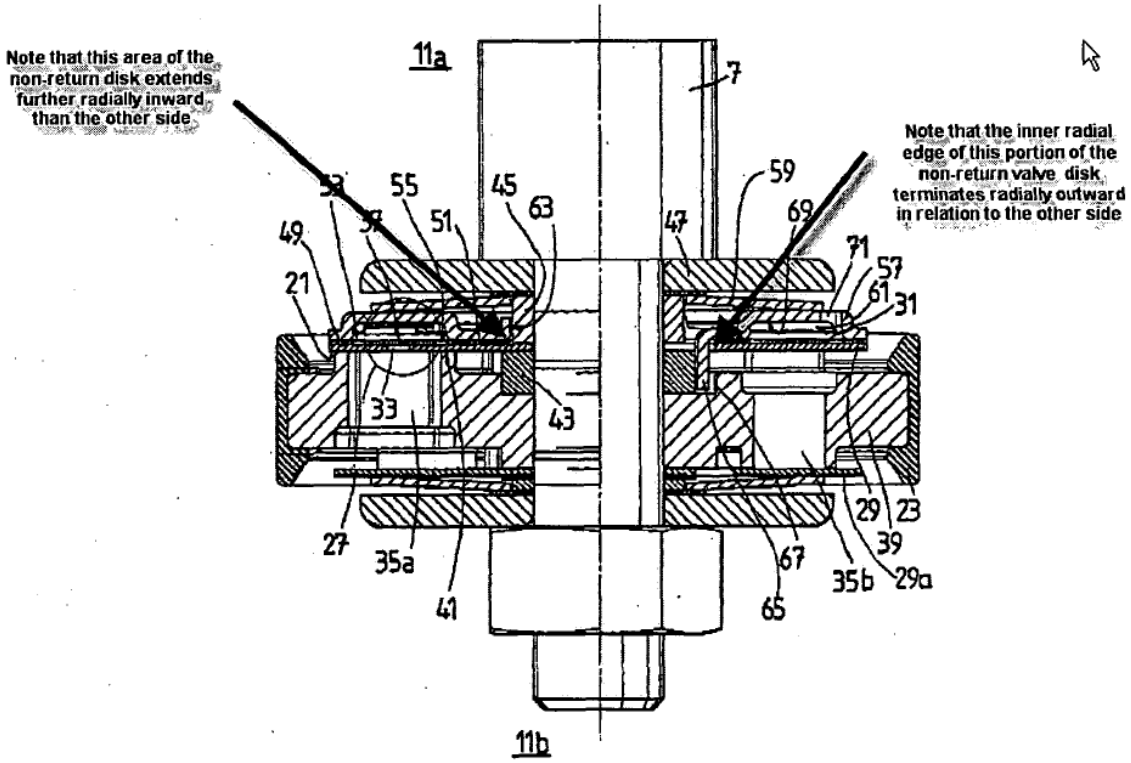
Claim 11

Claim 11 is dependent on claim 1 and adds the limitation (Claims App'x A-2:8-11):

> wherein the nonreturn valve disk comprises a central opening and a plurality of centering webs extending radially into said opening, said centering webs centering said nonreturn valve disk with respect to said damping valve body.

The Examiner rejected claim 11 as anticipated by Fenn. The Examiner found the above-quoted limitation satisfied in Fenn by the inner surface of changeover disk 31 that defines an opening which receives a shaft at the end of piston rod 7.

The Examiner provided an annotated copy of Fenn's Figure 2, which is reproduced below (Ans. 6: Annotated Figure 2.)



A copy of Fenn's Figure 2 as annotated by the Examiner.

According to the Examiner (Ans. 4-9):

> Note that on the left side, the radially inner portion of the non-return valve disk terminates against member 45, while on the right side, the radially inner portion of the non-return valve disk terminates against member 65 which is disposed radially outward of member 45. Because the disk clearly does not have a radially inner surface that is circular in shape, portions can be considered webs.

ZF contends that the inner circumferential edge of the changeover disk 31 defines a round opening and does not show a plurality of webs extending radially into that opening. (App. Br. 9:3-5.)

ZF's argument is persuasive. In Fenn, regardless of whether the inner surface of the changeover disk 31 is oblong or not a perfect circle, it is a

continuous rounded surface that defines a central opening through which a shaft at the end of piston rod 7 extends. (Fenn Figure 2.) The Examiner does not explain how a continuous rounded surface that defines an opening also includes webs that extend radially into that opening. We have not overlooked the Examiner's annotations of Fenn's Figure 2. However, they lack sufficient explanation and, thus, do not provide support for the rejection. We do not find anything as constituting radially extending webs.

We do not sustain the Examiner's rejection of claim 11 under 35 U.S.C. § 102(b) as anticipated by Fenn.

F. CONCLUSION

1) Fenn's retaining disk 57 and spring element 59 together forms a "disk spring."

2) The relationship between Fenn's clamping surface 49 and recess 53 satisfies the claim requirement that a clamping surface with at least one notch is held when a damping medium flows through the notch.

3) The continuous inner surface of Fenn's changeover disk 31 that defines a rounded opening does not have a plurality of centering webs that extend radially into that opening.

G. ORDER

The rejection of claims 1, 2, and 7 under 35 U.S.C. § 102(b) as anticipated by Fenn is **affirmed**.

The rejection of claim 11 under 35 U.S.C. § 102(b) as anticipated by Fenn is **reversed**.

AFFIRMED-IN-PART

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