

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WOLFGANG HILL, LASZLO MAN, and WOLFGANG REIK

Appeal 2008-1776
Application 10/820,093
Technology Center 3600

Decided: August 11, 2008

Before MURRIEL E. CRAWFORD, JENNIFER D. BAHR, and LINDA E.
HORNER *Administrative Patent Judges.*

BAHR, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Wolfgang Hill et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1, 2, 7, 14-16, 20, 21, 23-25, 35,

and 37. Claims 29-34 have been canceled.¹ We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

The Appellants' invention is drawn towards an electromagnetic friction clutch including a first clutch part 2, a second clutch part 3 rotatably mounted relative to the first clutch part 2 and rotationally fixed to a shaft 4, and a magnetic circuit formed by a coil 17, a soft core 12, and a permanent magnet 14 (Spec. 10, ¶ 32; Spec. 11, ¶ 36; Spec. 12, ¶ 37; and fig. 1). The first clutch part 2 includes an outer clamping jaw 10a and an inner clamping jaw 10b such that when the clutch is engaged the second clutch part 3 is clamped between the clamping jaws 10a and 10b due to a clamping force generated by the magnetic flux flowing through the first and second clutch parts 2, 3 (Spec. 10, ¶ 33 and Spec. 11, ¶ 35). In exemplary embodiments, the magnetic flux traversing the first and second clutch parts 2, 3 changes between the first and second clutch parts 2, 3 at either twelve crossover points (Spec. 12, ¶ 38 and fig. 1) or at twenty crossover points (Spec. 12, ¶ 38 and fig. 2).

¹ Claim 36 has been allowed and claims 3-6, 8-13, 17-19, 22, and 26-28 are objected to by the Examiner as being dependent upon a rejected base claim and otherwise indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim. Claims 3-6, 8-13, 17-19, 22 and 26-28 are not part of the instant appeal.

Claim 1 is illustrative of the claimed invention and reads as follows:

1. An electromagnetic friction clutch comprising:

a first clutch part and a second clutch part mounted so as to be rotatable relative to each other, the first clutch part having a soft magnetic material defining at least part of a magnetic circuit, the magnetic circuit having a magnetic force for pressing the first and second clutch parts together; and

at least one electromagnet being situated in the magnetic circuit to change the magnetic flux in the first and second clutch parts;

the magnetic circuit being guided in the first and second clutch parts in such a way that the magnetic flux changes at at least ten flux crossover points one after the other in a direction of flow of the magnetic circuit between the first and second clutch parts.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Stretch US 6,619,453 B2 Sep. 16, 2003

Claims 1-2, 7, 14-16, 20-21, 23-25, 35, and 37 stand rejected under 35 U.S.C. § 102(e) as anticipated by Stretch.

The Examiner provides reasoning in support of the rejections in the Answer (mailed May 16, 2007). The Appellants present opposing arguments in the Appeal Brief (filed January 8, 2007) and the Reply Brief (filed July 13, 2007).

FACTS

Stretch

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

1. Stretch discloses a torque transfer device 10 (clutch) including a first clutch part (input member 18) and a second clutch part (output member 22) rotatably mounted relative to the first clutch part and coupled to a shaft 16, and an electromagnet 48 (col. 3, ll. 19-27; col. 4, ll. 10-14; and fig. 1).
2. The device of Stretch further includes a first gap 26 holding magnetically reactive medium 28 and a second gap 34 holding a friction plate 30 (col. 3, ll. 33-37 and 41-47, and figs. 1 and 2).
3. The first clutch part (input member 18) and the second clutch part (output member 22) include regions of high magnetic permeability 52 that alternate with regions of low magnetic permeability 54 (col. 4, ll. 29-35 and fig. 4) such that the magnetic flux traverses the first and the second gaps 26 and 34 (col. 5, ll. 40-43 and 50-52 and fig. 4).
4. As the magnetic flux 56 traverses the first gap 26, the magnetically reactive particles 28 lock into chains 60, thereby generating mechanical friction against surfaces 62 and 64 of the first clutch part (input member 18) and the second clutch part (output member 22) resulting in a transfer of torque (col. 4, ll. 50-58 and figs. 2 and 3).
5. As the magnetic flux is increased, the magnetic flux traverses the second gap 34 and attracts friction plate 30 toward the second clutch part (output member 22) resulting in a transfer of torque (col. 5, ll. 50-60 and fig. 4).

6. The magnetic flux traversing the first and second clutch parts 18 and 22 changes between the first and second clutch parts 18 and 22 at fifteen crossover points (fig. 4).

7. The regions of low magnetic permeability 54 are formed by either creating grooves or inserting rings of non-magnetic material (*e.g.*, stainless steel) in the first clutch part (input member 18) and the second clutch part (output member 22) (col. 5, ll. 13-35 and figs. 1 and 5-8)

OPINION

Claims 1-2, 7, 20-21, 23-25, and 37

The Appellants argue the rejection under 35 U.S.C. §102(e) of claims 1-2, 7, 20-21, 23-25, and 37 together as a group. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(vii), we have selected claim 1 as the representative claim to decide the appeal, with claims 2, 7, 20-21, 23-25, and 37 standing or falling with claim 1.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The issue presented in the instant appeal of the rejection of claim 1, and claims 2, 7, 20-21, 23-25, and 37 standing or falling with claim 1, is whether the Appellants have demonstrated that the Examiner erred in determining that the subject matter of claim 1 is anticipated by Stretch.

The Appellants argue that in contrast with the Appellants' claimed invention of an electromagnetic friction clutch, the clutch of Stretch is a

“combination” device (App. Br. 5) including both an electromagnetic particle clutch 68 and an electromagnetic friction clutch 70 (App. Br. 4 and Reply Br. 2). Referring to Figure 4 of Stretch, the Appellants argue that the magnetic flux in the electromagnetic friction clutch 70 does not change “at at least ten flux crossover points one after the other in a direction of flow of the magnetic circuit between the first and second clutch parts” (App. Br. 5).

In response, the Examiner takes the position that the electromagnetic particle clutch 68 and the electromagnetic friction clutch 70 are not “a pair of independent clutches,” as the Appellants argue, but rather constitute regions of a single, unitary clutch. According to the Examiner, when the excitation of the coil occurs, the first clutch part (input member 18) and the second clutch part (output member 22) are both activated, hence operating as one (Ans. 4).

When construing claim terminology in the United States Patent and Trademark Office, claims are to be given their broadest reasonable interpretation consistent with the specification, reading claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004)). A person of ordinary skill in the art would understand a “magnetic circuit” to be a “closed path through the magnetic material and air gaps” traveled by the magnetic flux (*See* U.S. Patent No. 4,306,589, issued Dec. 22, 1981, col. 5, ll. 11-13). When the electromagnet 48 is activated in the clutch of Stretch a magnetic flux is created which traverses the first clutch part (input member 18), the second clutch part (output member 22), and air gaps 26 and 34 throughout both regions 68 and 70 (Findings of Fact 4 and

5), thereby forming a “magnetic circuit.” Since the magnetic circuit forms a continuous, closed path traversing both regions 68 and 70 we agree with the Examiner that the clutch of Stretch operates as one, not two independent clutches (Ans. 4). Furthermore, Figure 4 of Stretch specifically shows a “magnetic circuit” (the dashed lines forming a closed loop) in which the magnetic flux changes between the first and second clutch parts 18 and 22 at fifteen crossover points (Finding of Fact 6). As such, we find that the teachings of Stretch satisfy the limitation of a “magnetic circuit being guided in the first and second clutch parts in such a way that the magnetic flux changes at at least ten flux crossover points one after the other in a direction of flow of the magnetic circuit between the first and second clutch part,” as required by claim 1.

In light of the above, the Appellants’ argument does not demonstrate error in the rejection of claim 1. Thus, the rejection of claim 1, and claims 2, 7, 20-21, 23-25, and 37 standing or falling with claim 1, is sustained.

Claims 14, 15, and 16

The Appellants argue that Stretch does not disclose a first clutch part having a “first clamping jaw and a second clamping jaw,” and the second clutch part being “configured as a disk positioned between the first and second clamping jaws” as called for in claim 14 (App. Br. 5). The Examiner takes the position that the clutch of Stretch includes a first clamping jaw 18 and a second clamping jaw 22 with a disk 30 positioned therebetween (Ans. 4). We disagree. As shown above, with respect to independent claim 1 from

which claim 14 depends, the clutch of Stretch includes a first clutch part (input member 18), a second clutch part (output member 22), and a friction plate 30 located therebetween (Findings of Fact 1 and 2). Contrary to the Examiner's position, the elements referenced by numerals 18 and 22 cannot be interpreted to be both the first and the second clutch parts in independent claim 1, and at the same time be the first and second jaws of the first clutch part in dependent claim 14. Therefore, we agree with the Appellants that Stretch does not disclose all the claim limitations of claim 14 or of claims 15 and 16, which depend from claim 14. In conclusion, because Stretch does not disclose all the claim limitations of claims 14-16, the rejection of claims 14-16 as anticipated by Stretch cannot be sustained.

Claims 35

The Appellants argue that the clutch of Stretch does not teach a "laminated core having layers electrically insulated from each other at right angles to the direction of flow" (App. Br. 6). The Examiner refers to the low magnetic permeability regions 54 as being "laminated layers" (Ans. 3). We note that the clutch in Stretch includes regions of high magnetic permeability 52 that alternate with regions of low magnetic permeability 54 (Finding of Fact 3). However, we do not find that Stretch discloses a "laminated core," as required by claim 35. On the contrary, the low magnetic permeability regions 54 of Stretch are formed by either creating grooves or inserting rings of non-magnetic material (*e.g.*, stainless steel) in the input member 18 and output member 22 (Finding of Fact 7). Further, Stretch is silent with respect to the regions of high magnetic permeability 52. The only indication we

have regarding the structure of the regions of high magnetic permeability 52 is provided by Figures 1, 4, and 5-8 which do not appear to show a “laminated” structure, but rather a monolithic structure. Furthermore, Stretch does not disclose that the layers of the laminated core are “electrically insulated from each other at right angles to the direction of flow.” Therefore, we agree with the Appellants that Stretch does not disclose all the claim limitations of claim 35. In conclusion, because Stretch does not disclose all the claim limitations of claim 35, the rejection of claim 35 cannot be sustained.

DECISION

The decision of the Examiner to reject claims 1, 2, 7, 20, 21, 23, 24, 25, and 37 under 35 U.S.C. § 102(e) as anticipated by Stretch is affirmed.

The decision of the Examiner to reject claims 14, 15, 16, and 35 under 35 U.S.C. § 102(e) as anticipated by Stretch 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

vsh

Appeal 2008-1776
Application 10/820,093

DAVIDSON, DAVIDSON & KAPPEL, LLC
485 7TH AVENUE
14TH FLOOR
NEW YORK, NY 10018