

1 UNITED STATES PATENT AND TRADEMARK OFFICE

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3  
4 BEFORE THE BOARD OF PATENT APPEALS  
5 AND INTERFERENCES  
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8 *Ex parte* STEPHEN F. GASS, DAVID A. FANNING,  
9 DAVID J. FULMER and DAVID S. D'ASCENZO  
10

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12 Appeal 2007-4061  
13 Application 10/100,211  
14 Technology Center 3700  
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17 Decided: May 27, 2008  
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20 *Before* WILLIAM F. PATE, III, TERRY J. OWENS, and  
21 JENNIFER D. BAHR, *Administrative Patent Judges*.

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23 PATE, III, *Administrative Patent Judge*.

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25  
26 DECISION ON APPEAL  
27

28 STATEMENT OF CASE

29 The Appellants appeal under 35 U.S.C. § 134 (2002) from a Final  
30 Rejection of claims 1, 22-24 and 30. Claims 11-14, 17-19, 21 and 25-27  
31 were withdrawn from consideration, and claims 2-10, 15, 16, 20, 28 and 29

1 were previously canceled. We have jurisdiction under 35 U.S.C. § 6(b)  
2 (2002).

3 The Appellants claim a machine with a moving cutting tool and a  
4 safety system having a reaction subsystem that stops the moving cutting tool  
5 within 10 milliseconds (ms) after detection of an unsafe condition such as  
6 contact between the cutting tool and the user.

7 The sole independent claim 1 reads as follows:

- 8 1. A machine comprising:  
9 an operative structure adapted to perform a task, where  
10 the operative structure includes a mechanical cutting tool  
11 adapted to move in at least one motion; and  
12 a safety system adapted to detect the occurrence of an  
13 unsafe condition between a person and the cutting tool, where  
14 the safety system includes a detection subsystem adapted to  
15 detect the unsafe condition, and a reaction subsystem adapted to  
16 mitigate the unsafe condition;  
17 where the reaction subsystem includes a brake  
18 mechanism adapted to stop at least one motion of the cutting  
19 tool within 10 milliseconds after detection of the unsafe  
20 condition.

21  
22 The prior art relied upon by the Examiner in rejecting the claims is:

23 Friemann US 3,858,095 Dec. 31, 1974  
24

25 The Examiner rejected claims 1 and 22-24 under 35 U.S.C. § 102(b)  
26 as lacking novelty over Friemann.

27 The Examiner also rejected claim 30 under 35 U.S.C. § 103(a) as  
28 unpatentable over Friemann.

29 In addition to the Appeal Brief and Reply Brief, the Appellants also  
30 rely on Declarations by Dr. David A. Turcic and Stephen F. Gass (one of the  
31 Appellants).

1           We AFFIRM the Examiner's rejections.

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### ISSUES

4           The following issues have been raised in the present appeal<sup>1</sup>.

5           1.       Whether the Appellants have shown that the Examiner erred in  
6 rejecting claims 1 and 22-24 under 35 U.S.C. § 102(b) as lacking novelty  
7 over Friemann.

8           2.       Whether the Appellants have shown that the Examiner erred in  
9 rejecting claim 30 under 35 U.S.C. § 103(a) as unpatentable over Friemann.

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### FINDINGS OF FACT

12           The record supports the following findings of fact (FF) by a  
13 preponderance of the evidence.

14           1.       Friemann discloses a machine (Fig. 2) including an operative  
15 structure adapted to perform a task, where the operative structure includes a  
16 mechanical cutting tool 5 adapted to move in at least one motion and  
17 a safety system (Fig. 1) adapted to detect the occurrence of an unsafe  
18 condition between a person and the cutting tool (Col. 1, l. 44-Col. 2, l. 14),  
19 where the safety system includes a detection subsystem 3 adapted to detect  
20 the unsafe condition (Fig. 1; Col. 2, ll. 6-14; Col. 3, ll. 21-26).

21           2.       Friemann also discloses that the safety system includes a  
22 reaction subsystem adapted to mitigate the unsafe condition, the reaction

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<sup>1</sup> An obviousness-type double patenting rejection of claims 1 and 22-24 has been withdrawn by the Examiner (Ans. 4). Thus, the Appellants' arguments regarding the double patenting rejection are moot.

1 subsystem including a brake mechanism adapted to stop at least one motion  
2 of the cutting tool within 10 ms after detection of the unsafe condition (Figs.  
3 3 to 6; Col. 2, ll. 6-14; Col. 3, ll. 26-36; Col. 3, l. 67-Col. 4, l. 7; Col. 4, ll.  
4 52-53).

5 3. Friemann further specifically discloses that “[e]xperiments have  
6 shown that with a protective circuit arrangement in accordance with the  
7 invention it is possible for a band cutter to be stopped in about 1/200th  
8 second”, i.e. 5 ms (Col. 2, ll. 15-20).

9

#### 10 PRINCIPLES OF LAW

11 “A claim is anticipated only if each and every element as set forth in  
12 the claim is found, either expressly or inherently described, in a single prior  
13 art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d  
14 628, 631 (Fed. Cir. 1987). “To serve as an anticipating reference, the  
15 reference must enable that which it is asserted to anticipate. ‘A claimed  
16 invention cannot be anticipated by a prior art reference if the allegedly  
17 anticipatory disclosures cited as prior art are not enabled.’” *Elan*  
18 *Pharmaceuticals, Inc. v. Mayo Foundation for Medical Education and*  
19 *Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003) *citing Amgen, Inc. v.*  
20 *Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003).

21 Moreover, “[s]ection 103 forbids issuance of a patent when ‘the  
22 differences between the subject matter sought to be patented and the prior art  
23 are such that the subject matter as a whole would have been obvious at the  
24 time the invention was made to a person having ordinary skill in the art to  
25 which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct.

1 1727, 1734 (2007). “References relied upon to support a rejection under 35  
2 USC 103 must provide an enabling disclosure”. *In re Payne*, 606 F.2d 303,  
3 314 (CCPA 1379).

4 Enablement under 35 U.S.C. § 112, first paragraph, requires the  
5 specification to “contain a written description of the invention . . . in such  
6 full, clear, concise, and exact terms as to enable any person skilled in the art  
7 to which it pertains . . . to make and use the same . . .” There is a  
8 presumption that “both the claimed and unclaimed disclosures in a prior art  
9 patent are enabled.” *Amgen*, 314 F.3d at 1355. The burden of rebutting the  
10 presumption of enablement of the cited prior art by a preponderance of the  
11 evidence falls on the applicant. *In re Sasse*, 629 F.2d 675, 681 (CCPA  
12 1980).

13 The test for enablement is whether one skilled in the art would have to  
14 resort to undue experimentation in order to practice the invention. *In re*  
15 *Angstadt*, 537 F.2d 498, 503 (CCPA 1976). Undue experimentation analysis  
16 may include consideration of: (1) the quantity of experimentation necessary,  
17 (2) the amount of direction or guidance presented, (3) the presence or  
18 absence of working examples, (4) the nature of the invention, (5) the state of  
19 the prior art, (6) the relative skill of those in the art, (7) the predictability or  
20 unpredictability of the art, and (8) the breadth of the claims. *In re Wands*,  
21 858 F.2d 731, 737 (Fed. Cir. 1988). These factors are illustrative, and what  
22 is relevant to an enablement determination depends upon the facts of the  
23 particular case. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 727 F.2d  
24 1200, 1213 (Fed. Cir. 1991).

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ANALYSIS

Rejection of claims 1 and 22-24 under 35 U.S.C. § 102(b)

The Examiner rejected claims 1 and 22-24 as lacking novelty over Friemann. The Friemann reference discloses each and every limitation of independent claim 1 including stopping of a band cutter in 10 ms and 5 ms (FF 1 to 3; Ans. 4). In this regard, Friemann discloses that stopping of a band cutter in 5 ms has been experimentally shown, thereby purporting to have actually reduced the invention to practice (FF 2 and 3).

Initially, the Appellants argue the patentability of these claims together as a group in the Appeal Brief. Correspondingly, we select independent claim 1 to decide the appeal of these claims, dependent claims 22-24 standing or falling with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii).

The Appellants contend that statements in Friemann regarding stopping of the band cutter in 10 ms and 5 ms are either mistakes or over statements because it is physically impossible for the machine of Friemann to stop the band cutter within the disclosed time (App. Br. 10). Thus, the Appellants contend that because Friemann does not enable the brake mechanism of claim 1 as established by the Declarations of Stephen F. Gass and Dr. David A. Turcic, Friemann cannot anticipate claim 1 (App. Br. 11 and 12 to 21).

The Examiner states that the Declarations have been considered but that they are insufficient to establish non-enablement because they merely contain the opinions of the declarants on how the device of Friemann operates without conducting any physical tests (Ans. 5). The Examiner also notes that the Declarations do not provide any statements from inventor

1 Friemann as to enablement of the disclosed brake mechanism (Ans. 6).  
2 Furthermore, the Examiner notes numerous prior art references to rebut Dr.  
3 Turcic's statement that there are no relays that can operate to stop the band  
4 cutter of Friemann within the time frame required (Ans. 6).

5 We agree with the Appellants that a physical test is not required to  
6 establish non-enablement (App. Br. 21). Providing statements from the  
7 inventor of the cited prior art invention is also not a requirement to establish  
8 non-enablement. However, we agree with the Examiner that the Appellants  
9 failed to establish non-enablement of Friemann as discussed in further detail  
10 *infra*.

11 Initially, having reviewed the Declarations in evidence, we find them  
12 to be deficient as a matter of law for establishing non-enablement of  
13 Friemann. As explained *supra* in the Principles of Law section, the prior art  
14 reference must enable one of ordinary skill in the art to make or carry out the  
15 claimed invention without undue experimentation. The Declarations of  
16 record do not discuss whether undue experimentation would be required to  
17 implement the protective circuit in the disclosure of Friemann, or discuss the  
18 various factors set forth in *In re Wands*. In addition, the Declaration by Dr.  
19 Turcic focuses on his own personal knowledge rather than the  
20 experimentation necessary for one of ordinary skill to make and use the  
21 invention the reference discloses (Decl. of Turcic ¶¶ 8, 14, 15, 21 and 26).

22 Notwithstanding the noted deficiencies, we will discuss the  
23 Declarations in detail in the interest of a complete record. Although we fully  
24 credit Dr. Turcic as an expert, we view the Declarations as containing  
25 significant assumptions and conjecture regarding the device of Friemann,

1 and do not discuss the factors for establishing non-enablement. For instance,  
2 the declarants assume that Friemann's braking system uses “standard relays”  
3 having certain operational characteristics (Decl. of Turcic ¶ 12; Decl. of  
4 Gass ¶ 9). However, the Examiner has entered into the record, evidence of  
5 relays that can operate much quicker, for instance, within 1 ms (Ans. 6).  
6 The Appellants contend that the relays disclosed in the various patents cited  
7 by the Examiner are not relays used to switch motors or electromagnetic  
8 brakes (App. Br. 25). However, there is insufficient evidence in the record  
9 as to the state of the relay art, that such relays identified by the Examiner  
10 could not be used for the purposes of a braking system of Friemann, or that  
11 their use would require undue experimentation by one of ordinary skill in the  
12 relay art.

13 Dr. Turcic states that even if the relays of Friemann could operate the  
14 motor and brake instantaneously, the motor and brake disclosed cannot stop  
15 the band cutter within 10 ms because motors take time to stop and brakes  
16 take time to engage (Decl. of Turcic ¶ 13). The declarants provide various  
17 calculations in support of this statement (Decl. of Turcic ¶¶ 16 to 20; Decl.  
18 of Gass ¶¶ 7 and 8). While it is true that the motor and the brake each  
19 require time to apply a braking force, the time required is dependent on the  
20 motor and the brake used as well as other factors. The declarants assume a  
21 specific configuration of the motor and the brake in the analyses presented  
22 rather than focusing on the undue experimentation analysis required by the  
23 jurisprudence.

24 Dr. Turcic also states that he does not know of any AC induction  
25 motor capable of stopping Friemann's band cutter within 10 ms by

1 application of DC braking, and that the rotational inertia of the motor  
2 preclude such a result (Decl. of Turcic ¶ 14). However, the question is not  
3 whether a motor is capable of stopping the Friemann's band cutter within 10  
4 ms by DC braking, but rather, whether a combination of DC braking of the  
5 motor and application of the electromechanical brake can be implemented in  
6 view of Friemann by one of ordinary skill, without undue experimentation,  
7 so that stopping of the band cutter within the 10 ms can be attained.

8         Moreover, rotational inertia is dependent on the specifics of the motor  
9 used. Dr. Turcic acknowledges the existence of high performance  
10 components such as a DC motor that have sufficiently low rotational inertia  
11 to stop in 6 ms but states that such motors are too small and too expensive  
12 (Decl. of Turcic ¶ 20). This further demonstrates the limited probative value  
13 of the Declarations which make assumptions regarding specific geometry,  
14 size, and cost of the components of the cutter machine.

15         The declarants also assert that the figures of the Friemann reference  
16 show geometries of the various pulleys that are used in the band cutter, and  
17 based on various calculations showing their rotational inertia, state that it is  
18 impossible for motors to stop themselves as well as the rollers and pulleys in  
19 10 ms (Decl. of Turcic ¶¶ 15-18; Decl. of Gass ¶ 6). However, it is well  
20 established that patent drawings are not to scale and cannot be relied upon  
21 for disclosing specific dimensions unless the specification indicates  
22 otherwise. *See Hockerson-Halberstadt, Inc. v. Avia Group Intern., Inc.*, 222  
23 F.3d 951, 956 (Fed. Cir. 2000). Thus, while Dr. Turcic's extensive  
24 calculations establish his engineering expertise, they do not significantly aid  
25 in establishing non-enablement of Friemann (Decl. of Turcic ¶¶ 16-19).

1           The Declarations further analyze electromagnetic brakes and the time  
2 required for such brakes to apply their braking force (Decl. of Turcic ¶ 21;  
3 Decl. of Gass ¶ 10). However, the evidence of record does not establish that  
4 the disclosed electro-mechanical brake and “magnet brake” refer exclusively  
5 to electromagnetic brakes. In addition, the basis for the requirement of 200  
6 N-m braking force is not clear (Decl. of Turcic ¶ 21). Furthermore, as noted  
7 *supra*, the braking of the combination of the motor and the  
8 electromechanical brake is at issue, not just the braking of the brake.

9           Finally, the declarants state that the rotational inertia associated with  
10 the various guide rollers and the drive pulley further increases the time  
11 required to stop the band cutter and provide calculations of torque or power  
12 required for stopping the rollers (Decl. of Turcic ¶¶ 22 to 24; Decl. of Gass ¶  
13 6). However, this analysis again assumes various characteristics of the  
14 pulleys such as dimension, configuration, mass, etc., and assumes that there  
15 is no slippage between the band cutter and the guide rollers.

16           While we have discussed in some detail the various assumptions and  
17 conjectures the declarations are based upon, we must emphasize that the  
18 principal problem with the declarations is that they fail in recognizing what  
19 must be proved in this instance, i.e., that one of ordinary skill could not  
20 make or use the disclosure of Friemann and successfully stop the saw  
21 disclosed therein in the disclosed time frame without undue experimentation.  
22 We again note that it is the Appellant’s burden to rebut the presumption that  
23 the unclaimed disclosures in a prior art patent are enabled. *See Amgen*, 314  
24 F.3d at 1355; *In re Sasse*, 629 F.2d at 681. In giving more weight to a prior  
25 publication than to subsequent conclusory statements by experts, we are

1 acting well within our discretion as triers of fact. *See Velandar v. Garner*,  
2 348 F.3d 1359, 1371 (Fed. Cir. 2003).  
3 Therefore, based on the totality of the evidence including the Declarations of  
4 record, we find that the Appellants have not satisfied their burden of  
5 establishing the non-enablement of the disclosure of Friemann by a  
6 preponderance of the evidence. Hence, we also find that the Appellants  
7 have not established that the Examiner erred in rejecting claims 1 and 22-24  
8 as lacking novelty over Friemann.

9

10 Rejection of claim 30 under 35 U.S.C. § 103(a)

11 The Examiner rejected claim 30 reciting stopping at least one motion  
12 of the cutting tool in less than 5 ms after detection of the unsafe condition as  
13 unpatentable over Friemann (Ans. 4). The Examiner states that Friemann  
14 discloses the need for fast acting brakes, that it would have been obvious to  
15 decrease the stopping time in order to increase effectiveness, and that  
16 discovering the optimum or workable ranges involves only routine skill  
17 (Ans. 4 and 5).

18 The Appellants initially argue that because Friemann is not enabled  
19 with respect to independent claim 1 from which claim 30 depends, the  
20 Examiner erred in rejecting claim 30 as well (App. Br. 26 and 27).  
21 However, this argument fails because the Appellants have not shown that  
22 independent claim 1 is not enabled by Friemann as discussed *supra*.

23 The Appellants further argue that even if Friemann did enable a brake  
24 mechanism adapted to operate in 5 ms as specifically disclosed (i.e. enabled  
25 with respect to claim 1), it still would not enable a brake mechanism which

1 is adapted to stop a cutting tool in less than 5 ms as recited by claim 30  
2 (App. Br. 27). The Appellants argue that the claimed limitation is not a  
3 variable that can be optimized by the use of routine skill in the art and that it  
4 is a significant and difficult issue to adapt a brake mechanism to operate in  
5 the recited time scale (App. Br. 27). However, the Appellants do not  
6 provide any substantial evidence in support of these arguments, or  
7 supplement the evidence already discussed relative to independent claim 1.

8 Thus, based on preponderance of the evidence of record, we find that  
9 the Appellants have again failed to satisfy the burden of establishing non-  
10 enablement of Friemann with respect to dependent claim 30. Hence, we also  
11 find that the Appellants have not established that the Examiner erred in  
12 rejecting claim 30.

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14

#### CONCLUSIONS

15 1. The Appellants have not shown that the Examiner erred in  
16 rejecting claims 1 and 22-24 as lacking novelty over Friemann.

17 2. The Appellants have also not shown that the Examiner erred in  
18 rejecting claim 30 as unpatentable over Friemann.

19

20

#### ORDER

21 The Examiner's rejections of claims 1, 22-24 and 30 are AFFIRMED.

1           No time period for taking any subsequent action in connection with  
2 this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R.  
3 § 1.136(a)(1)(iv) (2007).

4

5

AFFIRMED

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