

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FELIX TITZ and HANS MOSBURGER

Appeal No. 1998-0514
Application 08/523,907¹

HEARD: OCTOBER 7, 1999

Before COHEN, STAAB and NASE, *Administrative Patent Judges*.

STAAB, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 1-5 and 9. No other claims are currently

¹ Application for patent filed September 6, 1995. According to appellants, the application is a continuation of Application 08/159,140, filed November 30, 1993, now abandoned.

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pending.

The Invention

Appellants' invention pertains to a cross cutter for web stock material such as corrugated cardboard. In devices of this type, cutter holders having cutters fastened thereto are carried by tubular cylinders. The cylinders are mounted for rotation in opposite directions, so that when web stock material is fed between the cylinders, it is cut by the cutters. Counterweights are provided on the cylinders opposite the cutter holders to balance the cylinders as they rotate. Appellants' invention is directed to forming the cylinders, cutter holders and counterweights of composite fiber material having heat expansion coefficients that are selected to improve cutting quality and/or enhance the rigidity of the cylinder/cutter holder/counterweight assembly.

Independent claims 1, 3 and 4, copies of which are found in an appendix to appellants' corrected brief, are illustrative of the appealed subject matter.

The Applied Prior Art

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The references of record relied upon by the examiner in support of a rejection under 35 U.S.C. § 103 are:

Gomi et al. (Gomi)	5,061,533	Oct. 29, 1991
German Patent ²	8,900,516	Apr. 20, 1989

The Examiner's Rejection

Claims 1-5 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over the German reference 8,900,516 (hereinafter, German '516) in view of Gomi.

The rejection is explained in the examiner's answer (Paper No. 22, mailed September 17, 1997).

Discussion of Applied References

German '516, the examiner's primary reference, appears to be appellants' prior art jumping off point and is discussed in the "Background of the Invention" section of the specification (pages 1-2). This discussion is reproduced below for the reader's convenience:

A cross cutter is known in the art from German Utility Model DE-GM 89 00 516, wherein pipe-shaped

² Our understanding of this German language reference is derived from a discussion of this reference in the "Background" section of appellants' specification, and from a translation of this reference prepared in the Patent and Trademark Office, a copy of which is appended to this opinion.

cutter cylinders formed of a composite carbon fiber material are rotatably seated in pairs above each other in a machine frame. The cutter holders fastened on each cutter cylinder, along with the cutters and the oppositely located counterweight, are still made of metal.^[3] In this case it is disadvantageous that the mass inertia moment of the rotating cutter cylinder system does not allow the highest operational rpm with reduced energy absorption. Furthermore, such a cross cutter does not produce the optimum cutting quality for the web because of the flexing of the cutter cylinders during cutting.

Gomi, the examiner's secondary reference, is directed to an improved laminated roll formed from carbon fiber composite materials (CFRP). Gomi indicates (column 1, line 64 through column 2, line 15) that because carbon fibers have highly anisotropic Young's modulus and linear expansion coefficients, it is difficult to fabricate high precision laminated rolls formed from CFRP because unbalanced stress is produced in the interior of the lamination structure. In particular, Gomi states that "if the design of the lamination structure is not correct, a stretching stress acts in the radial direction in

³ The aforementioned translation of German '516 indicates that cutter holders 10 are formed from metal (translation, page 6, lines 8-10). However, the translation makes no mention whatsoever of counterweights, or of the material from which any such counterweights may be formed.

the interior of the molded article and cracking occurs therein" (column 4, lines 1-4). Gomi's solution to this prior art problem is to carefully select the orientation angle, the orientation order, and the thickness of each layer of the laminate so that a compressive

stress always occurs, whereby interlaminar cracking or a generation of strain is controlled (column 2, lines 25-34; column 4, lines 9-13). In addition, "by making the linear expansion coefficient in the axial direction of the CFRP outer layer much smaller than the average linear expansion coefficient in the axial direction of other layers except the CFRP outer layer, the linear precision of the formed roll after the peripheral polishing is greatly improved" (column 2, lines 34-39). Gomi states that the roll may be used as "a delivery roll, guide roll or printing roll for use during the processing of a film, foil, paper, cloth or the like" (column 1, lines 9-11).

Independent Claim 1

Considering first the rejection of claim 1, this

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independent claim calls for a cross cutter comprising, inter alia, a frame having fixed bearings, a pair of cutter cylinders rotatably mounted in opposed parallel relationship in said bearings, with each of the cutter cylinders having a cutter holder and a counterweight secured thereto. Claim 1 further sets forth that the cutter cylinders are formed of a composite fiber material having a heat expansion coefficient substantially equal to or

less than 0 mm/K, and that the cutter holders and counterweights are formed of "said" composite fiber material. Thus, claim 1 requires that the cutter cylinders, cutter holders and counterweights are all formed of the same composite fiber material, and that this material has a heat expansion coefficient substantially equal to or less than 0 mm/K.

The differences between German '516 and claim 1 are as follows:⁴

⁴ In light of the above noted discussion of German '516 found in the "Background" section of appellants'

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- 1) German '516 does not disclose that the cutter holders and counterweights are formed of composite fiber material;
- 2) German '516 does not disclose that the cutter holders and counterweights are made of the same composite fiber material as the cutter cylinders; and
- 3) German '516 does not disclose that the composite fiber material in question has a heat expansion coefficient substantially equal to or less than 0 mm/K.

Even if we were to agree with the examiner that one of ordinary skill in the art would have turned to Gomi in an attempt to improve upon the German '516 cross cutter, it is our opinion that, at best, the ordinarily skilled artisan would have viewed Gomi as merely suggesting that the cutter cylinders of the German '516 cross cutter should be formed as a laminate structure in accordance with Gomi's teachings in order to thereby improve the rigidity of the cutter cylinders.

specification, we presume that the cutter cylinders of this prior art cross cutter include counterweights.

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However, this would not have resulted in a cross cutter having any of the enumerated differences noted above. In particular, we find no disclosure, suggestion, or inference in the teachings of German '516 and Gomi, taken either alone or collectively, that the cutter holders and/or the counterweights of German '516 should be formed from composite fiber material, much less that they should be formed from the same composite fiber material as the cutter cylinders, or from the composite fiber material should have a heat expansion coefficient substantially equal to or less than 0 mm/K.

Where prior art references require a selective combination to render obvious a claimed invention, there must be some reason for the combination other than hindsight gleaned from the

invention disclosure, *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). In the fact situation before us, we are unable to agree with the examiner that one of ordinary skill in the art would have been motivated by the teachings of Gomi to form the cutter

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cylinders, cutter holders and counterweights of German '516 from the same composite fiber material having a heat expansion coefficient substantially equal to or less than 0 mm/K, as now claimed. Accordingly, we will not sustain the standing rejection of claim 1, or claim 2 that depends therefrom, as being unpatentable over the collective teachings of German '516 and Gomi.

Independent Claim 3

Claim 3 calls for a cross cutter comprising, inter alia, cutter cylinders formed of a composite fiber material having a heat expansion coefficient A, and cutter holders formed of a composite fiber material having a heat expansion coefficient B, with A being different than B, such that the difference in heat expansion coefficients

creat[es] an expansion differential between said cutter cylinders and said cutter holders at elevated temperatures resulting in the stress of both the cutter cylinder and the cutter holder thereby increasing the rigidity of the cutter holder.

German '516 does not disclose that the cutter holders are formed of composite fiber material, or that the heat expansion coefficients of the cutter cylinders and cutter holders differ

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such that at elevated temperatures, stress results in both the cutter cylinder and the cutter holder to increase the rigidity of the cutter holder.

We are aware that Gomi teaches that the average linear expansion coefficients of the inner layers should be made larger than the linear expansion coefficient of the outermost layer to provide high rigidity in the axial direction (column 5, lines 50-58). However, we once again view this as suggesting, at best, that the cutter cylinders of German '516 should be so constructed to provide for improved rigidity of the cutter cylinders. Accordingly, we will not sustain the rejection of claim 3, or claim 5 that depends therefrom, as being unpatentable over the collective teachings of German '516 and Gomi.

Independent Claim 4

Claim 4 calls for a cross cutter comprising, inter alia, cutter cylinders formed of a composite fiber material having a heat expansion coefficient "a", cutter holders formed of a

composite fiber material having a heat expansion coefficient

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"b", cutters formed of a material having a heat expansion coefficient "c", and counterweights formed of a material having a predetermined heat expansion coefficient "d", wherein the relationship between the heat expansion coefficients is such that both "c" and "b" are greater than both "a" and "d".

German '516 does not disclose that the cutter holders are formed of composite fiber material, or that the heat expansion coefficients of the cutters, cutter holders, cutter cylinders, and counterweights are such that the heat expansion coefficients of both the cutters and cutter holders are greater than the heat expansion coefficients of both the cutter cylinders and the counterweights.

For the reasons discussed above, we view Gomi as suggesting, at best, that the cutter cylinders of German '516 should be constructed in accordance with Gomi's teachings to provide for improved rigidity of the cutter cylinders. We find no suggestion whatsoever in the combined teachings of the applied references that the cutter holders of German '516 should be formed of composite fiber material, or that the heat expansion coefficients of the cutters, cutter holders, cutter cylinders, and counterweights should be selected to provide

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for the relationship thereof called for in the last paragraph of claim 4. Therefore, we also will not sustain the rejection of claim 4, or claim 9 that depends therefrom, as being unpatentable over the collective teachings of German '516 and Gomi.

Summary

The decision of the examiner is reversed.

REVERSED

IRWIN CHARLES COHEN)	
Administrative Patent Judge)	
)	
)	
LAWRENCE J. STAAB)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
JEFFREY V. NASE)	
Administrative Patent Judge)	

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