

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILHELM AICHELE

Appeal 2007-3162
Application 09/947,007
Technology Center 3700

Decided: January 31, 2008

Before TERRY J. OWENS, JENNIFER D. BAHR, and ANTON D.
FETTING, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant appeals from a rejection of claims 1-24, which are all of the pending claims.

THE INVENTION

The Appellant claims a rotary cutting device. Claim 1 is illustrative:

1. A rotary cutting device comprising:
 - a machine frame;
 - a cutting tool which is rotatable about a rotational axis on the machine frame;
 - an anvil roller with a cutting support which is rotatable about a rotational axis;
 - a cutting edge being arranged on said cutting tool for cutting a web of material that is fed between said cutting tool and said anvil roller and which co-operates with said cutting support, wherein said cutting edge and said cutting support comprise, at least in the surface regions thereof, at least one of tungsten carbide, titanium carbide, tantalum carbide, and titanium nitride;
 - at least one support ring with a support surface mounted on said cutting tool for supporting said cutting tool relative to said anvil roller;
 - wherein:
 - in a non-loaded state said cutting edge is set back relative to the support surface to provide a spacing therebetween in a radial direction with respect to said rotational axis of said cutting tool, the radial spacing between said cutting edge and said support surface in said non-loaded state being formed in dependence on the modulus of elasticity of said at least one support ring in such a manner that said cutting edge almost touches said cutting support in a loaded state when a bias force effective between said cutting tool and said anvil roller is exerted, and
 - in the loaded state, said cutting edge does not project beyond the support surface.

THE REFERENCES

Aichele	US 5,174,185	Dec. 29, 1992
Buck	US 5,388,490	Feb. 14, 1995
Ishibuchi	US 2002/0184985 A1	Dec. 12, 2002 (filed Jul. 31, 1998)

THE REJECTIONS

The claims stand rejected as being unpatentable under 35 U.S.C. § 103 as follows: claims 1-12 over Buck in view of Ishibuchi; claims 13-21, 23, and 24 over Buck in view of Aichele; and claim 22 over Buck in view of Ishibuchi and Aichele.

OPINION

The rejections are affirmed as to claims 1-22 and reversed as to claims 23 and 24. The application is remanded to the Examiner.

Rejection of claims 1-12

Claims 1-9

The Appellant does not provide a substantive argument as to the separate patentability of claims 2-9 (Br. 22-23). We therefore limit our discussion of claims 1-9 to claim 1, the sole independent claim among those claims. Claims 2-9 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007).

Buck discloses “rotary die systems for cutting repetitive shapes from sheet metal” (col. 1, ll. 11-12). The systems comprise a rotary press (10) including a die roller (20) with a central cylindrical body (21) having thereon a protruding cutting blade (22) in a pattern of the shape to be cut (col. 2, l. 68 – col. 3, l. 7). Die roller 20 also has a pair of conical bearer surfaces (23, 24) concentric with cylindrical body 20’s central axis, one of bearer surfaces 23, 24 being disposed at each end of central cylindrical body 21 (col. 7, ll. 12-15). Roller die 20 is made of “[a] tool steel that is of high chrome content and through hardened, is substantially stiffer than other materials, and preferred for ‘zero tolerance’ and kiss cutting operations”

(col. 11, ll. 7-11).¹ Below roller die 20 and parallel to it is a rotary, laterally adjustable anvil (28) having a cylindrical central region 29 opposing cutting blade 22 (col. 7, ll. 25-28). At each end of central region 29 is one of a pair of conical bearer surfaces (30, 31) that registers in load bearing relationship with die 20's bearer surfaces 23, 24 (col. 7, ll. 28-31). The bearer surface pairs 23, 24 and 30, 31 have radial dimensions relative to cylindrical central region 29 such that a given clearance exists between cutting blade 22's tips and anvil 28's cylindrical surface 29 (col. 7, ll. 48-52). "Pressure rollers [62] are urged against the conical bearers from a virtually non-deflecting pressure bridge, to preload the die and anvil and alter the clearance by compression of the bearers within their yield limits" (col. 4, ll. 40-44).

Ishibuchi discloses a rotary apparatus for cutting band shaped material such as corrugated fiberboard sheet (§ 0002). The apparatus includes a knife (2) on a rotating cylinder (1), and the cutting is achieved by successively bringing knife 2 into contact with an anvil (7) (§0039). Knife 2 may be made of "a WC-Co base hard material (Hv = about 1,000 to about 1,400)" (§ 0042). Anvil 7 may be coated with a hard material such as a carbide cermet composed of a WC-Co base material or a ceramic formed of an Al₂O₃ base material (§ 0051).

The Examiner contends that it would have been obvious to a person of ordinary skill in the art to use WC-Co as taught by Ishibuchi to make the cutting edge and cutting support of Buck to prolong their service life (Ans.

¹ Zero tolerance cutting cuts entirely through the sheet material such that the blade tip must lightly contact or be very slightly spaced from the anvil (col. 1, ll. 34-37). Kiss cutting cuts through only the adhesive backed surface layer of a laminate, with the underlying substrate remaining uncut (col. 1, ll. 37-40).

4).

The Appellant, Aichele, relies (Br. 16-21) upon his Rule 132 Declaration (filed Sep. 21, 2006) wherein he states:

Hard metal cutting edges of the type used with the present invention have a lower elasticity and are more brittle when compared to the steel cutters used in prior art devices. It is therefore crucial that the cutting edge will not extend beyond the support surface of the support ring(s) when hard metal is used. Otherwise, the hard metal cutting edge would be immediately destroyed upon contact with the hard metal cutting support on the anvil roller. [¶ 6]

* * *

[P]rior to the present invention, it was generally believed that hard metal cutting edges could not be successfully used in rotary cutting devices of the type shown in the Patent Application, due to their brittleness. Nothing known to me at the time of the invention would have led me to overcome this conclusion. [¶ 12]

Buck discloses the use of the system for kiss cutting wherein cutting edge 22 is spaced from anvil 28 by slightly less than the thickness of the substrate (col. 10, ll. 1-7; fig. 7). Thus, cutting edge 22 almost touches the cutting support in a loaded state as required by the Appellant's independent claim 1. Because cutting edge 22 does not contact the anvil, the destruction of the cutting edge caused by such contact referred to in the Declaration would not occur. Also, Buck teaches that in zero tolerance cutting the blade tip may be very slightly spaced from the anvil (col. 1, ll. 34-37). Due to that spacing the cutting edge destruction discussed in the Declaration would not occur. Moreover, common sense would have told one of ordinary skill in the art that there would be less wear on the cutting edge if it were spaced slightly from the anvil surface rather than being in contact with that hard surface. *See KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007) ("When

there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense”).

The Appellant argues that Buck’s device is not designed for zero tolerance cutting (Br. 20). Buck indicates that the system can be used for zero tolerance cutting as well as kiss cutting (col. 9, ll. 21-24).

The Appellant argues (Br. 17) that Ishibuchi discloses that when no spring is used and, instead, the main body of the knife cylinder provides the load of the nipping engagement between the knife and the anvil, there is damage to the knife and deep damage to the anvil (¶¶ 0057-59). Ishibuchi also discloses that the use of a spring makes possible setting the load level of nipping engagement between the knife and the anvil below the anvil-damage-free higher limit, thereby protecting the anvil from damage (¶ 0060). Regardless, the use of a slight clearance between the knife and the anvil would have been rendered obvious to one of ordinary skill in the art by Buck, as discussed above, to prevent wear damage to the knife and the anvil. Accordingly, the Appellant’s argument that Ishibuchi relies only upon a spring constant, not spacing, to overcome wear damage (Br. 17-18) is not persuasive.

The Appellant argues (Br. 18) that the Aichele Declaration states that the Appellant has satisfied a long felt need by providing a device that has survived over 92 million cuts without needing to be sharpened or replaced (¶ 10), and that the over 92 million cuts is an unexpected result (¶ 8). Since Aichele provides no support for these assertions, they are of little probative

value. *See In re Altenpohl*, 500 F.2d 1151, 1158 (CCPA 1974).

Claim 10

The Appellant argues that Ishibuchi does not disclose the Vickers hardness of anvil 7's coating (Br. 24). Ishibuchi discloses that anvil 7's coating can be a WC-Co base material (§ 0051) which, Ishibuchi discloses with respect to knife 2, has a Vickers hardness of about 1,000 to about 1,400 (§ 0042). Hence, Ishibuchi would have led one of ordinary skill in the art, through no more than ordinary creativity, to use, as anvil 7's coating, WC-Co having a Vickers hardness of at least 700 as required by the Appellant's claim 10. *See KSR*, 127 S.Ct. at 1741 (In making the obviousness determination one "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ").

Claim 11

The Appellant argues that Ishibuchi does not disclose that the WC-Co is sintered (Br. 24). In the absence of a disclosure of how Ishibuchi's WC-Co knife material and anvil coating are formed, one of ordinary skill in the art would have used conventional techniques. The Appellant's statement that the sintered metal is produced using powder metallurgical techniques (Spec. 4) indicates that those techniques were known prior to the Appellant's invention. Consequently, one of ordinary skill in the art would have been led by Ishibuchi, through no more than ordinary creativity, to use sintering as the technique for forming the WC-Co knife material and anvil coating.

Claim 12

The Appellant argues that the applied references do not disclose a titanium carbide hard material (Br. 24-25). Ishibuchi's disclosure that the WC-Co is exemplary (§§ 0042, 0051) would have led one of ordinary skill in

the art, through no more than ordinary creativity, to use, instead of the disclosed tungsten, other hard metals such as titanium.

For the above reasons we are not convinced of reversible error in the rejection of claims 1-12.

Rejection of claims 13-21, 23 and 24

The Appellant does not provide a substantive argument as to the separate patentability of claims 14-19 and 21 (Br. 30-32). Those claims, therefore, stand or fall with independent claim 13 from which they depend. *See* 37 C.F.R. § 41.37(c)(1)(vii)(2007).

Aichele discloses a material web cutting device having a cutting edge (13) and a counter plate (14) that “consist of hard wear resistant material such as, for example, hard metal, zirconium oxide or aluminum oxide ceramic” (col. 2, ll. 15-18).

The Examiner contends that it would have been obvious to a person of ordinary skill in the art to use hard metal as taught by Aichele to manufacture the cutting edge and cutting support of Buck to prolong their life (Ans. 5).

The Appellant argues that Aichele’s disclosure would have indicated, to one of ordinary skill in the art, that cutting plate 12 and counter plate 14, but not cutting plate 12’s hard metal edge 13, could be hard metal (Br. 28). Aichele’s disclosure that “[t]he cutting plate **12** with the cutting edge **13** and counter plate **14** consist of hard wear resistant material” (col. 2, ll. 15-18) indicates that cutting plate 12, its cutting edge 13, and counter plate 14 all consist of hard wear resistant material. Aichele’s teaching that the hard wear resistant material can be a hard metal (col. 2, ll. 16-17) would have led one of ordinary skill in the art, through no more than ordinary creativity, to use a

hard metal as the material of both the cutting edge and the cutting support as required by the Appellant's claim 13.

The Appellant argues that the statement in the Aichele Declaration that "prior to the present invention, it was generally believed that hard metal cutting edges could not be successfully used in rotary cutting devices of the type shown in the Parent Application, due to their brittleness" (§ 12) indicates that the Aichele patent's disclosure that "[t]he cutting plate **12** with the cutting edge **13** and counter plate **14** consist of hard wear resistant material" (col. 2, ll. 15-18) means that the cutting plate, but not its edge, is hard wear resistant material (Br. 28). Aichele's Declaration does not refer to the Aichele patent, and the patent clearly states that the cutting plate with its cutting edge consists of hard wear resistant material (col. 2, ll. 15-18). The Appellant's argument, therefore, is not persuasive.

The Appellant repeats the arguments set forth above with respect to long felt need and unexpected results and relies upon the Aichele Declaration in support of those arguments (Br. 25-26). Those arguments are not convincing as pointed out above regarding the rejection of claims 1-9.

Claim 20

The Appellant argues that Buck's figure 1 does not disclose or suggest a support sleeve that surrounds a base body of anvil roller 28 (Br. 31-32). Buck does not state that anvil 28's cylindrical central region (29) is a sleeve (col. 7, ll. 25-31). However, Buck's teaching that in zero tolerance cutting the cutting blade can lightly contact the anvil (col. 1, ll. 34-37) would have led one of ordinary skill in the art to make the anvil surface contacted by the cutting blade out of a hard, wear resistant material as taught by Aichele (col. 2, ll. 15-18) to resist wear caused by the cutting blade. Aichele's disclosure

of the use of a counter plate (14) that surrounds a counter roller (11) but is only large enough to match the size of a cutting plate (12) that supports a blade's cutting edge (13) (fig. 1) would have led one of ordinary skill in the art, through no more than ordinary creativity, to make Aichele's counter plate, as well as Buck's anvil 28's cylindrical central region 29, in the form of a sleeve of that size so that only the sleeve, and not the entire roller, needs to be made of the relatively expensive wear resistant material and, when replacement is required due to wear, expense is reduced because only the sleeve, not the entire roller, needs to be replaced. *See KSR*, 127 S.Ct. at 1741 (In making the obviousness determination one "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ").

For the above reasons we are not persuaded of reversible error in the rejection of claims 13-21.

Claims 23-24

For a disclosure of the sintered materials required by claims 23 and 24 the Examiner relies upon Ishibuchi (Ans. 12). Ishibuchi, however, is not applied to claims 23 and 24. We therefore reverse the rejection of those claims.

Rejection of claim 22

The Appellant relies, with respect to claim 22, upon the argument set forth with respect to claim 10 (Br. 32-33). That argument is not persuasive for the reason given above regarding the rejection of that claim.

Remand

We remand the Application for the Examiner and the Appellant to address on the record, considering our above discussion of the rejection of

claims 11 and 12, whether the inventions claimed in the Appellant's claims 23 and 24 would have been obvious to one of ordinary skill in the art under 35 U.S.C. § 103 over Buck in view of Aichele and Ishibuchi.

DECISION

The rejections under 35 U.S.C. § 103 of claims 1-12 over Buck in view of Ishibuchi and claim 22 over Buck in view of Ishibuchi and Aichele are affirmed. The rejection under 35 U.S.C. § 103 of claims 13-21, 23 and 24 over Buck in view of Aichele is affirmed as to claims 13-21 and reversed as to claims 23 and 24. The application is remanded to the Examiner.

In addition to affirming the examiner's rejection of one or more claims, this decision contains a remand. 37 CFR § 41.50(e) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)) provides that

[w]henver a decision of the Board includes a remand, that decision shall not be considered final for judicial review. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board may enter an order otherwise making its decision final for judicial review.

Regarding any affirmed rejection, 37 CFR § 41.52(a)(1) provides "[a]ppellant may file a single request for rehearing within two months from the date of the original decision of the Board."

The effective date of the affirmance is deferred until conclusion of the proceedings before the examiner unless, as a mere incident to the limited proceedings, the affirmed rejection is overcome. If the proceedings before the examiner do not result in allowance of the application, abandonment or a

Appeal 2007-3162
Application 09/947,007

second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejections, including any timely request for rehearing thereof.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART and REMANDED

hh

Lipsitz & McAllister, LLC
755 MAIN STREET
MONROE, CT 06468