

Substitute Claims

Roadmap

Piepho is non-analogous art

There is no motivation to combine

Claims 16 and 24 are patentable

Claim 15 (Revised MTA)

15. (Substitute for claim 1, if found unpatentable) A gyratory crusher main shaft of a crusher comprising:

[15a] a shaft body having a radially outward facing external surface, and a first end and a second end, wherein the second end is an uppermost extremity of the shaft body;

[15b] an axial region of the shaft body extending from the second end and being tapered relative to a longitudinal axis of the shaft body such that a cross sectional area of the shaft body at the tapered axial region decreases in a direction from the first end to the second end;

[15c] a shaft sleeve mounted on the tapered axial region; and

[15d] ~~at least one groove~~ a plurality of grooves indented at the external surface and positioned at the tapered axial region, the ~~at least one groove~~ plurality of grooves being arranged to receive a pressurized fluid to facilitate mounting and dismounting of the shaft sleeve at the shaft body.

Aqua Products: Burden on Petitioner

United States Court of Appeals
for the Federal Circuit

AQUA PRODUCTS, INC.,
Appellant

v.

JOSEPH MATAI, PERFORMING THE FUNCTIONS
AND DUTIES OF THE UNDER SECRETARY OF
COMMERCE FOR INTELLECTUAL PROPERTY
AND DIRECTOR, U.S. PATENT AND TRADEMARK
OFFICE,
Intervenor

2015-1177

Appeal from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in No. IPR2013-
00159.

Decided: October 4, 2017

JAMES R. BARNEY, Finnegan, Henderson, Farabow,
Garrett & Dunner, LLP, Washington, DC, argued for
appellant. Also represented by TIMOTHY P. MCANULTY,
DAVID MROZ, ANTHONY A. COPPOLA, ANTHONY J. DIFILIPPI,
JEFFREY A. SCHWAR, Abelman Frayne & Schwab, New
York, NY.

weight. The only legal conclusions that support and define the judgment of the court are: (1) the PTO has not adopted a rule placing the burden of persuasion with respect to the patentability of amended claims on the patent owner that is entitled to deference; and (2) in the absence of anything that might be entitled deference, the PTO may not place that burden on the patentee. All the rest of our cogitations, whatever label we have placed on them, are just that—cogitations. Even our discussions on whether the statute is ambiguous are mere academic exercises.

Aqua Prod., Inc. v. Matai, 872 F.3d 1290, 1327 (Fed. Cir. 2017)

Analogous Art

In re Clay: Analogous Art Criteria

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966 FEDERAL REPORTER, 2d SERIES

In justifying the Board's procedures, this court criticizes Mrs. Mendoza for not repeating the information that she had already filed. The court states: "in spite of a specific Order from the Administrative Judge requesting evidence showing that good cause existed for the delay, Mrs. Mendoza never once thereafter referred to timeliness, waiver, or good cause." This court fatally faults Mrs. Mendoza for not "thereafter" referring to "timeliness" and "waiver" or the reasons for her delay, although these precise words and her reasons had already been filed, in accordance with the Board's instructions for untimely appeals.

This court does not explain why the administrative judge's lack of responsiveness to Mrs. Mendoza's request for waiver must be twice excused, while placing the burden of prescience on Mrs. Mendoza. Mrs. Mendoza was apparently supposed to grasp that the administrative judge had failed to read her initial submission, and therefore that she was obliged to repeat it. However, even the Board does not now argue in favor of the procedure followed in this case.

C

The issuance of form "orders" in inapplicable circumstances can only confuse the public that OFPM and the Board are designed to serve. The Board recognizes that its *pro se* petitioners are "entitled to some leniency with respect to court-type formalities." *Black v. Dep't of Hous. and Urban Dev.*, 42 M.S.P.R. 83, 86 n. 2 (1989). See also *Hughes v. Rose*, 449 U.S. 5, 9, 101 S.Ct. 175, 176, 66 L.Ed.2d 163 (1980) (recognizing needs of *pro se* petitioners). The Board regulations state that "The judge will provide the party with an opportunity to show why the appeal should not be dismissed as untimely." 5 C.F.R. § 1201.22(c). The opportunity here provided was flawed, for Mrs. Mendoza's excuse was not considered by the Board, and she now is receiving from this court an adverse decision based on the Board's newly presented

From P. Breida *A Guide to Merit Systems Protection Board Law & Practice*, 244 (9th ed. 1992)

information and argument, to which she had no opportunity to respond.

I fully agree that it is improper for a court to intrude into an agency's routine operations. See *Phillips v. United States Postal Service*, 695 F.2d 1389, 1390 (Fed. Cir.1982) (Board authorized to control its operations through prescribed regulations). However, the issuance by an administrative judge of two non-responsive form "orders", not addressing the petitioner's request on its merits, followed by forfeiture of substantive legal rights, is not a routine operation. Judicial correction of legal error is not micromanagement of operations. It is our responsibility. See 5 U.S.C. § 7703(c) (Federal Circuit shall "set aside any agency action . . . found to be . . . obtained without procedures required by law, rule or regulation having been followed").



In re Carl D. CLAY.

No. 91-1492.

United States Court of Appeals,

Federal Circuit.

June 10, 1992.

Appeal was taken from decision of Board of Patent Appeals and Interferences affirming rejection of claims of patents for process for storing refined liquid hydrocarbon product in storage tank having dead volume between tank bottom and outlet port as being unpatentable because of obviousness. The Court of Appeals, *Lourie*, Circuit Judge, held that patent was not rendered obvious by prior invention using gel to channel flow of petroleum in naturally occurring underground reservoirs.

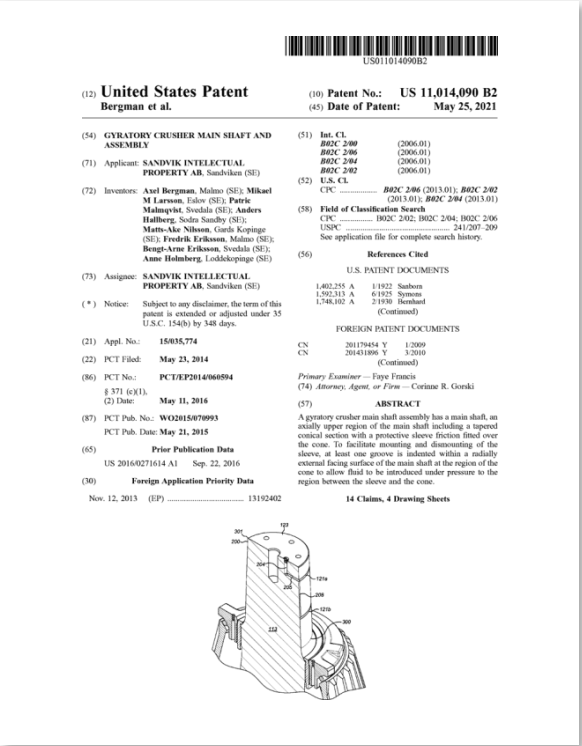
Reversed.

(Citing Chap. 3 of the Board's *Judge's Handbook*.)

[3] Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed.Cir.1986); *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979).

Field of Endeavor

'090 Patent's Subject Matter



(12) United States Patent Bergman et al.

(54) GYRATORY CRUSHER MAIN SHAFT AND ASSEMBLY

Ex. 1001

'090 Patent's Subject Matter

FIELD OF INVENTION

The present invention relates to a gyratory crusher main shaft and main shaft assembly for positioning within a gyratory crusher and in particular, although not exclusively, to a main shaft having an axial upper end region that tapers radially inward and comprises at least one groove to receive a pressurised fluid to facilitate mounting and demounting of a sleeve at the shaft.

Ex. 1001:10-20

United States Patent
Bergman et al.

(10) Patent No.: US 11,014,090 B2
(45) Date of Patent: May 25, 2021

(54) GYRATORY CRUSHER MAIN SHAFT AND ASSEMBLY

(71) Applicant: SANDVIK INTELLECTUAL PROPERTY AB, Sandviken (SE)

(72) Inventors: Axel Bergman, Molnäs (SE); Mikael M Larsson, Falun (SE); Patrik Malmqvist, Svedala (SE); Anders Hallberg, Solna Sandby (SE); Matts-Ake Nilsson, Gårda Koppinge (SE); Fredrik Eriksson, Molnäs (SE); Bengt-Arne Eriksson, Svedala (SE); Anne Holmberg, Lohkoppinge (SE)

(73) Assignee: SANDVIK INTELLECTUAL PROPERTY AB, Sandviken (SE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 348 days.

(21) Appl. No.: 15/035,774

(22) PCT Filed: May 23, 2014

(86) PCT No.: PCT/EP2014/060594
§ 371 (c)(1),
(2) Date: May 11, 2016

(87) PCT Pub. No.: WO2015/070993
PCT Pub. Date: May 21, 2015

(65) Prior Publication Data
US 2016/0271614 A1 Sep. 22, 2016

(30) Foreign Application Priority Data
Nov. 12, 2013 (EP) 13192402

(51) Int. Cl.
B02C 2/06 (2006.01)
B02C 2/06 (2006.01)
B02C 2/04 (2006.01)
B02C 2/02 (2006.01)
(52) U.S. Cl.
CPC B02C 2/06 (2013.01); B02C 2/02 (2013.01); B02C 2/04 (2013.01)
(58) Field of Classification Search
CPC B02C 2/02; B02C 2/04; B02C 2/06
USPC 241/207-209
See application file for complete search history.

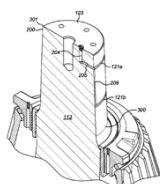
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1,746,102 A 2/1929 Stenlund
(Continued)

FOREIGN PATENT DOCUMENTS
CN 20179454 Y 1/2009
CN 20431896 Y 1/2010
(Continued)

Primary Examiner — Faye Francis
(74) Attorney, Agent, or Firm — Corinne R. Gorki

(57) ABSTRACT
A gyratory crusher main shaft assembly has a main shaft, an axially upper region of the main shaft including a tapered conical section with a protective sleeve friction fitted over the cone. To facilitate mounting and dismounting of the sleeve, at least one groove is indented within a radially external facing surface of the main shaft at the region of the cone to allow fluid to be introduced under pressure to the region between the sleeve and the cone.

14 Claims, 4 Drawing Sheets



'090 Patent's Subject Matter

- **Every reference cited in the background is *gyratory crusher art*.**

BACKGROUND ART

Gyratory crushers are used for crushing ore, mineral and rock material to smaller sizes. Typically, the crusher comprises a crushing head mounted upon an elongate main shaft. A first crushing shell is mounted on the crushing head and a second crushing shell is mounted on a frame such that the first and second crushing shells define together a crushing chamber through which the material to be crushed is passed.

The gyratory pendulum movement of the crushing head is supported by a lower bearing assembly positioned below the crushing head and a top bearing into which an upper end of the main shaft is journaled. Typically, the main shaft upper end is protected against wear by a sleeve. Commonly, the protective sleeve comprises a cylindrical geometry and is held at the main shaft via an interference or friction fit. Example protective sleeves are disclosed in U.S. Pat. Nos. 1,402,255; 1,592,313; 1,748,102; RU 718160; U.S. Pat. No. 4,027,825; RU 940837 and U.S. Pat. No. 5,934,583.

'090 Patent's Subject Matter

- **Prosecution:** Examiner cited only gyratory crusher references.

Notice of References Cited			Application/Control No. 15/035,774	Applicant(s)/Patent Under Reexamination BERGMAN ET AL.	
			Examiner FAYE FRANCIS	Art Unit 3725	Page 1 of 1

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*	B	US-RE27,970 E	04-1974	Johnson	B02C2/04	241/202
*	C	US-3,891,153 A	06-1975	Decker; Hanns	B02C2/047	241/208
*	D	US-5,718,391 A	02-1998	Musil; Joseph E.	B02C2/045	241/207
*	E	US-5,944,265 A	08-1999	Ganser, IV; William A.	B02C2/00	241/207
*	F	US-6,213,418 B1	04-2001	Gabriel; Michael R.	B02C2/04	241/207
*	G	US-7,048,214 B2	05-2006	Johnson; Louis Wein	B02C2/00	241/207
*	H	US-2009/0008489 A1	01-2009	Nieminen; Iipo K.	B02C2/047	241/207
*	I	US-7,922,109 B2	04-2011	Persson; Sebastian	B02C2/047	241/209
	J	US-				
	K	US-				
	L	US-				
	M	US-				

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20180919

Ex. 1001-1, References Cited
(September 25, 2018)

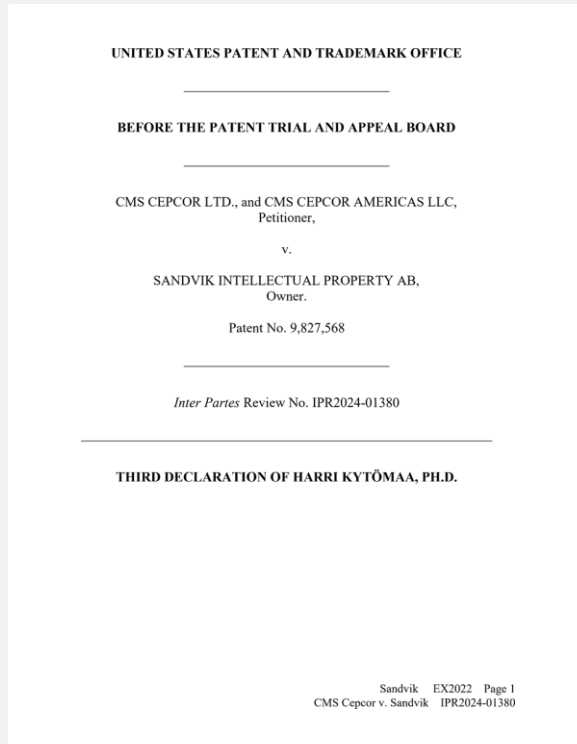
Piepho's Subject Matter

1. Field of the Invention

The present invention relates in general to an improved main shaft for a coal pulverizer, and more particularly to an improved main shaft for use in B&W Type E and EL pulverizers

Ex. 1018, 1:3-7

Dr. Kytömaa on Piepho's Subject Matter



15. In contrast, Piepho is not directed to a gyratory crusher at all. Piepho instead relates “to an improved main shaft for a coal pulverizer, and more particularly to an improved main shaft for use in B&W Type E and EL pulverizers.” (Ex. 1016, 1:5–8; see also Ex. 2006, 57:17–20.) Moreover, its purported invention is not a sleeve, but a coating layer for a coal pulverizer shaft: “the present invention comprises an intervening layer of a material such as a thermal sprayed ceramic coating . . . for reducing local stresses in the shaft within the joint by reducing the relative movement.” (Ex. 1016, 2:16–25; see also 2:55–

Ex. 2022, ¶ 15

In Re Bigio

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his phone call with Marmer, Marmer "retrieved records pertinent to [his] purchase from [the] Pagosa Ct. address." *Id.*

We conclude that this evidence was sufficient to support AT&T's request for an *ex parte* seizure order encompassing Marmer's residence. Accordingly, we hold that the district court's issuance of the order authorizing AT&T to search and seize property from Marmer's home—and its subsequent denial of Marmer's motion for return of the seized property—was not an abuse of discretion.¹⁴

III. CONCLUSION

Marmer challenged the district court's imposition of, and refusal to modify, an *ex parte* order authorizing Marmer's assets to be frozen and certain of his business property to be seized under the CCPA. We hold that the district court had legal authority to issue both the asset freeze and the seizure order. We also hold that, in this case, issuance of both orders was a proper exercise of the district court's discretion. Accordingly, the orders of the district court are AFFIRMED.



In re Alberto Lee BIGIO.
No. 03-1358.

United States Court of Appeals,
Federal Circuit.

DECIDED: Aug. 24, 2004.

Background: Inventor appealed after Patent and Trademark Office Board of

¹⁴ Regarding the district court's refusal to return seized property, Marmer did not argue, as he had regarding dissolution of the asset freeze, that the court's refusal was improper

Patent Appeals and Interferences affirmed rejection, based on obviousness, of application for patent for hair brush featuring an allegedly unique shape.

Holdings: The Court of Appeals, Rader, Circuit Judge, held that:

(1) "hair brush," as used in patent claims, was not limited to brushes for use only on human scalp hair, and also encompassed brushes that could be used on other parts of human or animal bodies;

(2) toothbrush art was analogous art, for purposes of obviousness determination; and

(3) combination of three toothbrush references rendered invention obvious.

Affirmed.

Pauline Newman, Circuit Judge, dissented and filed opinion.

1. Patents ©=324.5

Patent claim construction is a matter of law that Court of Appeals reviews without deference.

2. Patents ©=101(2)

During prosecution, Patent and Trademark Office (PTO) gives patent claims their broadest reasonable interpretation, and accordingly, Court of Appeals reviews the reasonableness of the PTO's disputed claim term interpretations.

3. Patents ©=324.5

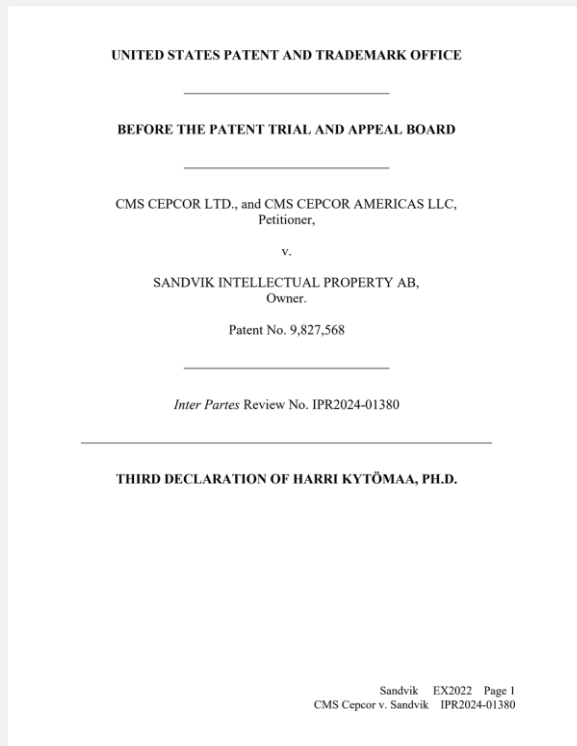
Court of Appeals reviews the ultimate conclusion of obviousness with respect to patent claims without deference, and the factual predicates for that legal conclusion for substantial evidence.

in the face of the agreed preliminary injunction. Issues not raised on appeal are considered abandoned. *United States v. Ford*, 270 F.3d 1346, 1347 (11th Cir.2001).

This test for analogous art requires the PTO to determine the appropriate field of endeavor by reference to explanations of the invention's subject matter in the patent application, including the **embodiments, function, and structure** of the claimed invention. *See Wood*, 599 F.2d at

In re Bigio, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (citation omitted)

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments



17. A coal pulverizer and a gyratory crusher are very different machines.

The embodiments, functions, and structure of the coal pulverizer described in

Piepho are not analogous to the embodiments, functions and structure of the

gyratory crusher as described in the '568 patent. For example, the size of the coal

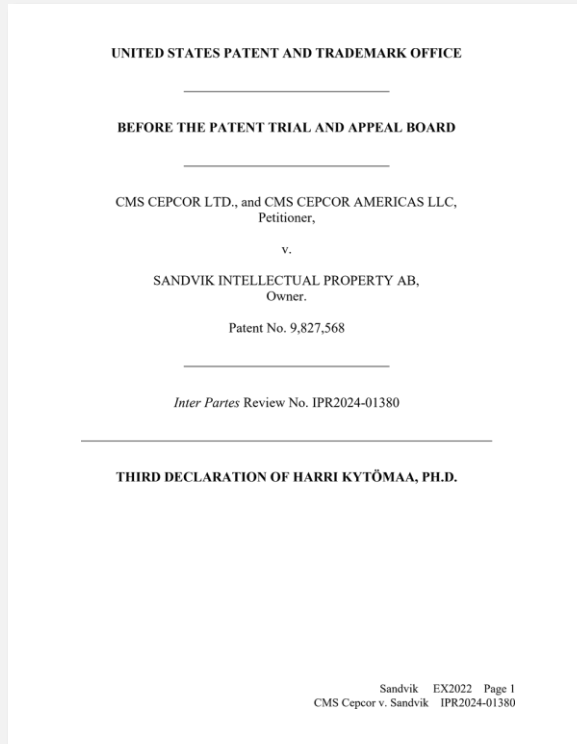
supplied to a B&W Type EL coal pulverizer, the type described in Piepho, should

ideally be 0.75 to 1 inch and the output pulverized coal particle sizes should be

0.003-0.012 inches. (*See* Ex. 2024.)

Ex. 2022, ¶ 17

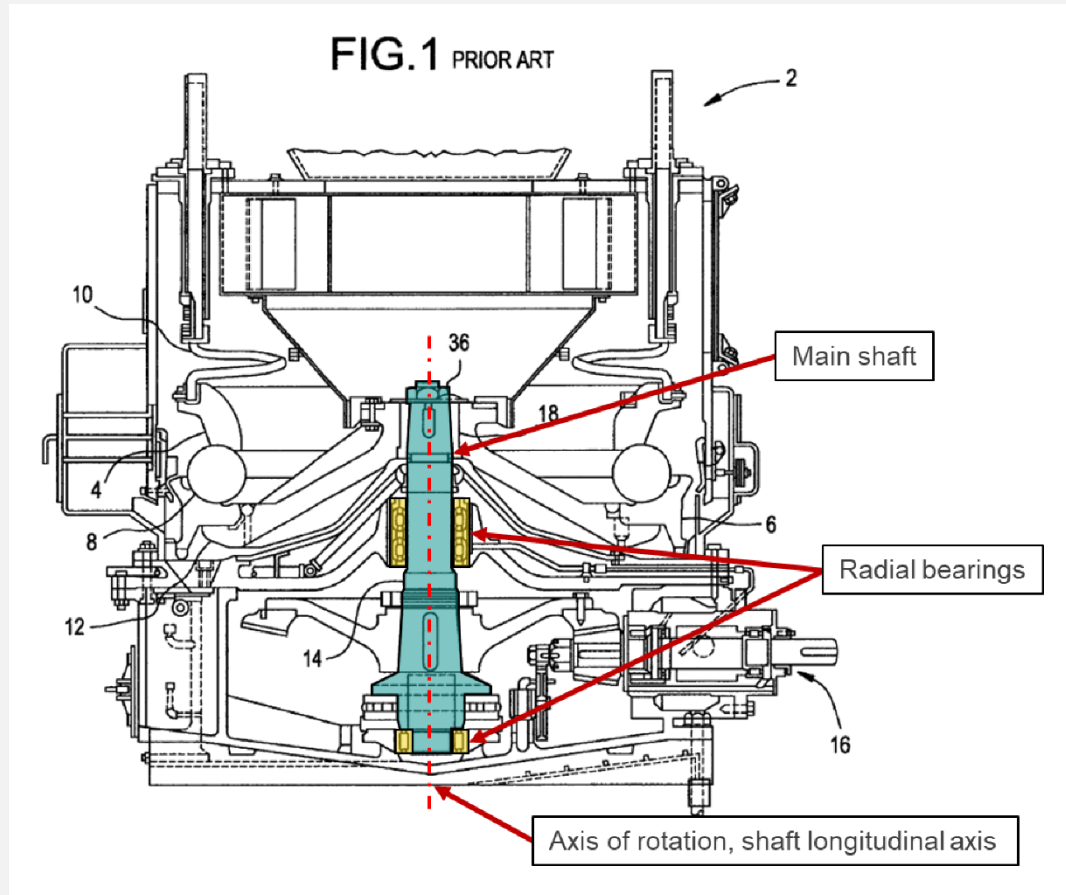
Input and Output Rock Size



19. Turning back to the size of the pulverized coal, it is so small that it can be entrained in air flow and removed out the top of the coal pulverizer. A Sandvik CH440 cone crusher accepts rock up to 9.8 inches wide and has an adjustable output size of 0.3 to 1.8 inches. (*See Ex. 2024.*) It must handle much larger input material with a wide range of sizes. The coal pulverizer requires a relatively small range of input sizes and coal itself is relatively soft compared to rocks such as granite. Below, I set forth additional significant distinctions between a coal pulverizer, as described in Piepho, and a gyratory crusher.

Ex. 2022, ¶ 19

'090's Gyrotory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments



Ex. 1018, FIG. 1

20. **First, operation.** A major distinction between the coal pulverizer described in Piepho and a gyrotory crusher is the design and behavior of the main shaft in each machine. The main shaft of the coal pulverizer is designed to rotate concentrically about the longitudinal axis of the shaft, and the longitudinal axis of the shaft is therefore nominally stationary and always aligned with the longitudinal axis of the coal pulverizer itself. (See Ex. 1018, 1:38–44; FIG. 1.) The concentrically rotating shaft of a coal pulverizer allows the use of conventional anti-friction bearings (i.e., roller bearings or ball bearings) to allow the shaft to rotate while constraining the shaft in all other directions, as illustrated in annotated FIG. 1 of Piepho, below.

Ex. 2022, ¶ 20

'090's Gyrotory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

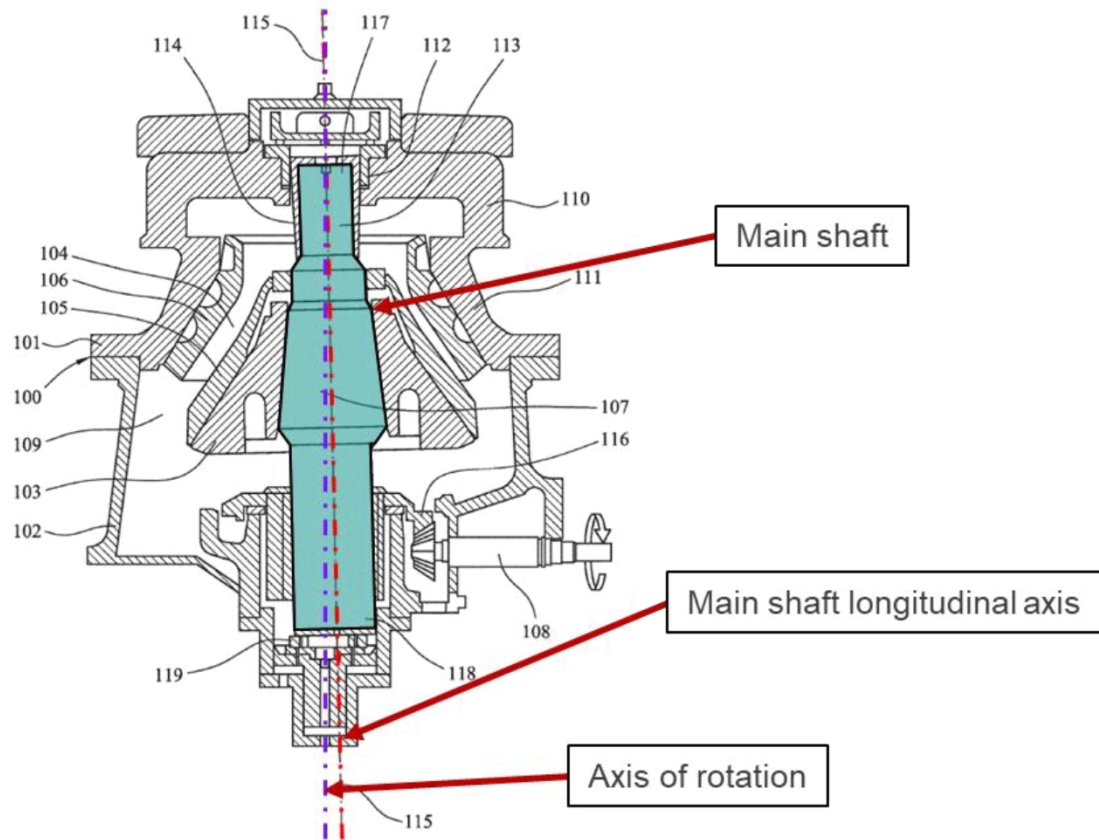


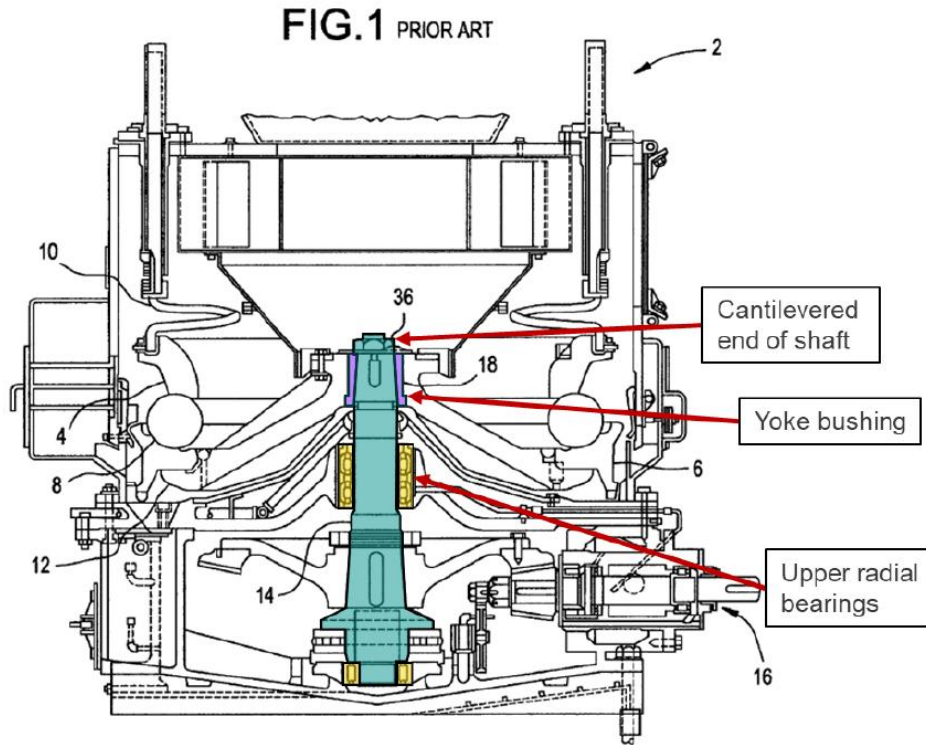
FIG. 1

Ex. 1001, FIG. 1 (Annotated)

21. The shaft of a gyrotory crusher, on the other hand, is designed to rotate eccentrically, that is, gyrate, with the longitudinal axis of the main shaft angled relative to the longitudinal axis of the rock crusher itself. (Ex. 1001, 3:59–63.) The axis of main shaft sweeps a conical pattern as the crusher operates, shifting the location of the main shaft in a pendulum motion relative to the outer crushing shell. The eccentric rotation of the gyrotory crusher shaft means that the shaft axis must move and requires that the upper bearing be capable of allowing tilting of the main shaft axis. The lower end of the gyrotory crusher shaft is mounted in an eccentric bushing to control the amount of eccentric motion, whereas the coal pulverizer shaft uses conventional anti-friction bearings for radial support at upper and lower bearing locations. The main shaft of the gyrotory rock crusher is free to rotate about its longitudinal axis as a consequence of interactions with the material being processed. This gyrating motion is illustrated in annotated FIG. 1 of the '568 patent, below.

Ex. 2022, ¶ 21

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments



Ex. 1018, FIG. 1 (Annotated)

22. The main shaft of the coal pulverizer in Piepho is also supported with a different configuration than the main shaft of the gyratory crusher described in the '090 patent. The main shaft 14 of the coal pulverizer in Piepho has an upper bearing located roughly in the middle of shaft with the upper end of the shaft cantilevered above the upper bearing. (Ex. 1018, FIG. 1.) The yoke 12 and yoke bushing 18 are attached to the cantilevered end of the shaft 14 as illustrated below.

Ex. 2022, ¶ 22

'090's Gyrary Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

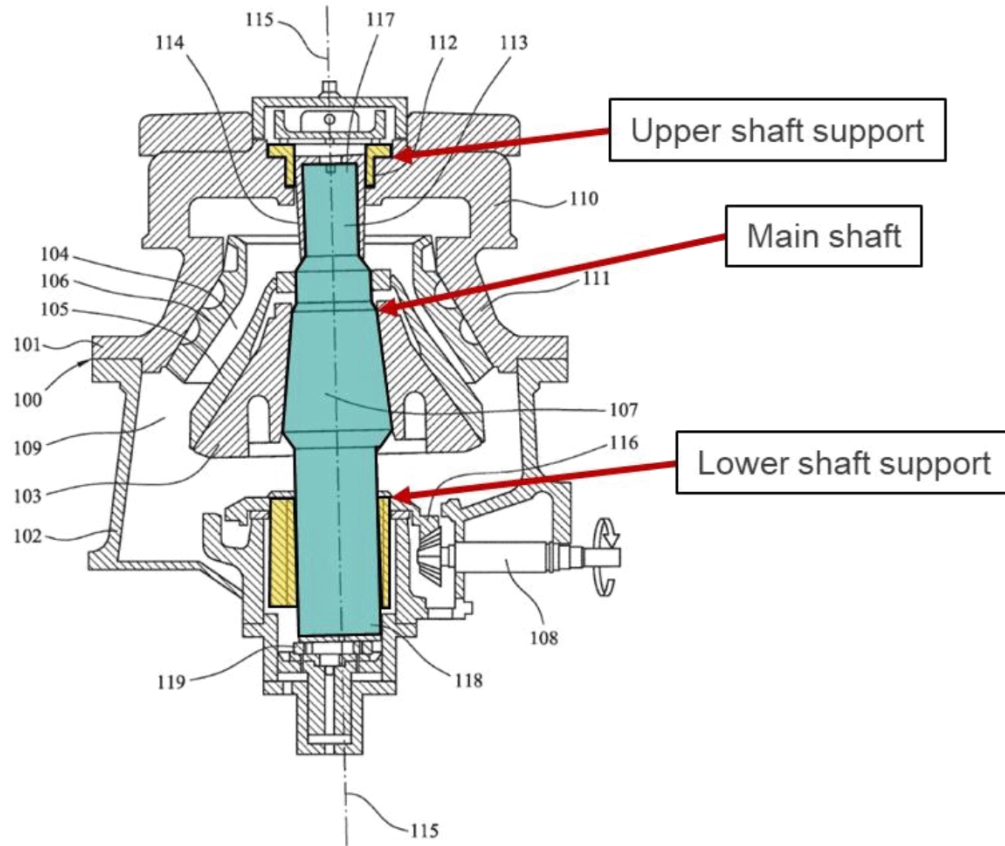


FIG. 1

Ex. 1001, FIG. 1 (Annotated)

23. The main shaft of the gyrary crusher of the '568 patent is not cantilevered. Rather, it is supported by bearings near each end of the shaft and is therefore simply supported, (Ex. 1001, 3:67–4:3), as illustrated below.

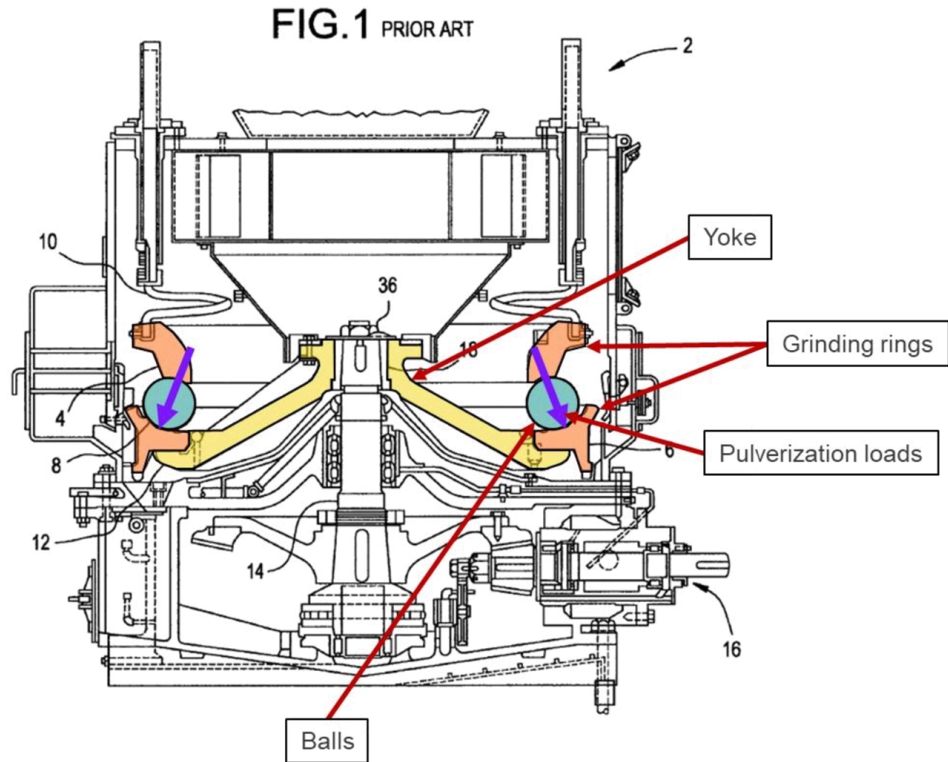
Ex. 2022, ¶ 23

Dr. Kytömaa on Shaft Support Configuration

24. The difference in shaft support configuration results in a significant difference in dynamic behavior, loading, and stress for the shaft and attached components. The main shaft sleeve for the gyratory crusher of the '568 patent is aligned with the upper shaft support point (bearing assembly 112), so it predominately supports radial loads and is intended to minimize the transmission of torsional loads, whereas in Piepho the upper end region of the shaft primarily transmits torsional loads to drive the yoke while accepting bending, axial, and radial loads. (Ex. 1001, FIG. 1.)

Ex. 2022, ¶ 24

'090's Gyrotory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments



Ex. 1018, FIG. 1 (Annotated)

25. **Second, loading.** In the coal pulverizer described in Piepho, coal is pulverized by balls that roll in grinding rings which extend around the entire circumference of the yoke. The grinding loads are therefore applied around the entire circumference of the yoke as illustrated below.

Ex. 2022, ¶ 25

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

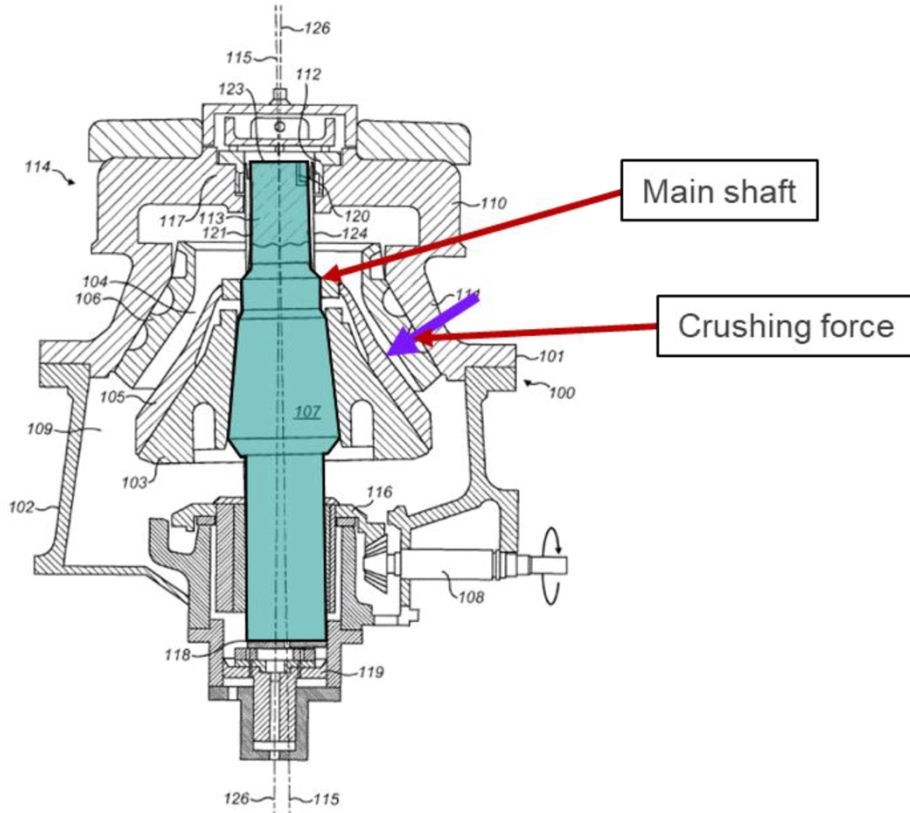


FIG. 1

Ex. 1001, FIG. 1 (Annotated)

26. In contrast, in the gyratory crusher described in the '090 patent, crushing force is only applied on one side of the shaft when the gyratory motion reduces the size of the crushing zone between the opposing crushing shells. Unlike the coal pulverizer, crushing forces are always concentrated on one side of the shaft and not distributed around the circumference, as illustrated below.

Ex. 2022, ¶ 26

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

27. **Third, wear environment.** The yoke bushing described in Piepho is not directly exposed to the coal being processed and the resulting abrasive environment. In contrast, the main shaft sleeve described in the '090 Patent is directly exposed to the materials being processed and the resulting abrasive environment.

Ex. 2022, ¶ 27

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

28. **Fourth, rotation.** The purpose of the yoke bushing in Piepho is to secure the yoke to the main shaft. (Ex. 1018, 3:6–7.) The yoke bushing must be able to transmit torque between the shaft and the yoke. Consequently, there is not intended to be any relative motion between the yoke and the yoke bushing or the yoke bushing and the shaft. This is in contrast with the main shaft sleeve of a gyratory crusher described in the '090 patent, which is intended to slide within the bearing assembly as the main shaft moves. (See Ex. 1001, 5:11–15.)

Ex. 2022, ¶ 28

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

29. **Fifth, assembly and disassembly.** The yoke bushing is not a wear component in the coal pulverizer and, as such, a POSITA would recognize that the yoke bushing would not be expected to require regular replacement. The main wear components in the coal pulverizer in Peipho are in the grinding zone including the balls and the grinding rings, not the yoke bushing. (See Ex. 1018, 1:62–64.) The main shaft sleeve of the '090 patent, in contrast, is a wear component in a gyratory crusher, and Sandvik recommends that the main shaft sleeve for its CH440 rock crusher be replaced annually or after 2000 hours of operation. (See Ex. 2026.)

Ex. 2022, ¶ 29

'090's Gyratory Crusher v. Piepho's Coal Pulverizer: Structure, Function, Embodiments

	Gyratory Crusher	Coal Pulverizer
Eccentric Rotation	✓	✗
Cantilevered Shaft	✗	✓
Load Distributed Around Main Shaft	✗	✓
Load Concentrated On One Side of Shaft	✓	✗
Main Shaft Wear Sleeve Replacement	✓	✗
Torque Transmission	✗	✓

In re Clay

656

966 FEDERAL REPORTER, 2d SERIES

In justifying the Board's procedures, this court criticizes Mrs. Mendoza for not replying to the information that she had already filed. The court states: "In spite of a specific Order from the Administrative Judge requesting evidence showing that good cause existed for the delay, Mrs. Mendoza never once thereafter referred to timeliness, waiver, or good cause." This court fatally faults Mrs. Mendoza for not "thereafter" referring to "timeliness" and "waiver" or the reasons for her delay, although these precise words and her reasons had already been filed, in accordance with the Board's instructions for untimely appeals.

This court does not explain why the administrative judge's lack of responsiveness to Mrs. Mendoza's request for waiver must be twice excused, while placing the burden of prosequence on Mrs. Mendoza. Mrs. Mendoza was apparently supposed to grasp that the administrative judge had failed to read her initial submission, and therefore that she was obliged to repeat it. However, even the Board does not now argue in favor of the procedure followed in this case.

C

The issuance of form "orders" in inapplicable circumstances can only confuse the public that OPM and the Board are designed to serve. The Board recognizes that its *pro se* petitioners are "entitled to some leniency with respect to court-type formalities." *Black v. Dep't of House and Urban Dev.*, 42 M.S.P.R. 83, 86 n. 2 (1989). See also *Hughes v. Rowe*, 449 U.S. 5, 9, 101 S.Ct. 173, 175, 56 L.Ed.2d 153 (1980) (recognizing needs of *pro se* petitioners). The Board regulations state that "The judge will provide the party with an opportunity to show why the appeal should not be dismissed as untimely." 5 C.F.R. § 1.201-22(e). The opportunity here provided was flawed, for Mrs. Mendoza's excuse was not considered by the Board, and she now is receiving from this court an adverse decision based on the Board's newly presented

From P. Brevida *A Guide to Merit Systems Protection Board Law & Practice*, 244 (9th ed. 1992)

information and argument, to which she had no opportunity to respond.

I fully agree that it is improper for a court to intrude into an agency's routine operations. See *Phillips v. United States Postal Service*, 695 F.2d 1389, 1390 (Fed. Cir.1982) (Board authorized to control its operations through prescribed Regulations). However, the issuance by an administrative judge of two non-responsive form "orders", not addressing the petitioner's request on its merits, followed by forfeiture of substantive legal rights, is not a routine operation. Judicial correction of legal error is not micromanagement of operations. It is our responsibility. See 5 U.S.C. § 7703(c) (Federal Circuit shall "set aside any agency action . . . found to be . . . obtained without procedures required by law, rule or regulation having been followed").



In re Carl D. CLAY.
No. 91-1492.

United States Court of Appeals,
Federal Circuit.

June 10, 1992.

Appeal was taken from decision of Board of Patent Appeals and Interferences affirming rejection of claims of patents for process for storing refined liquid hydrocarbon product in storage tank having dead volume between tank bottom and outlet port as being unpatentable because of obviousness. The Court of Appeals, Lourie, Circuit Judge, held that patent was not rendered obvious by prior invention using gel to channel flow of petroleum in naturally occurring underground reservoirs.

Reversed.

(citing Chap. 3 of the Board's *Judge's Handbook*).

The PTO argues that Sydansk and Clay's inventions are part of a common endeavor—"maximizing withdrawal of petroleum stored in petroleum reservoirs." However, Sydansk cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry. Sy-

In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992)

Wang Lab'ys Inc. v. Toshiba Corp.

The '392 patent is entitled "Memory Circuit for Programmable Machines"; it discloses a SIMM containing nine memory chips, eight for storing data and one for error detection, mounted in a single row. In the late 1970's, Allen-Bradley manufactured and sold the X9 SIMM for use in its 9-bit programmable controller. This product consisted of nine memory chips encapsulated in ceramic dual in-line packages (ceramic DIPs) mounted on an epoxy-glass printed circuit board substrate.

The Allen-Bradley art is not in the same field of endeavor as the claimed subject matter merely because it relates to memories.

Wang Lab'ys, Inc. v. Toshiba Corp.,
993 F.2d 858, 864 (Fed. Cir. 1993)

858

993 FEDERAL REPORTER, 2d SERIES

[United States] commerce" (emphasis added). The Section 45 definitions of "mark," "trademark," and "service mark" have also been amended to include words or other trade symbols intended to be used in commerce as well as those which have been used. This is the meaning now to be given to "mark" whether in the statute or treaty.

Finally, the amendments to Section 1 clarify that Section 44 is not independent from the requirements of Section 1. Section 1 now specifically references Section 44 and excepts a Section 44 application only from the requirements therein that an intent to use application must be timely followed with evidence of actual use in commerce before a registration may issue. 15 U.S.C. § 1051(b)(1)(A) (1988). The imposition of a requirement of a declaration of an intent to use in commerce on all treaty applicants under Section 44 is directly contrary to the *Merry Cow/Crocker Bank* rationale that the Paris Convention limits the grounds for rejection to those set forth in the Convention. Congress does not agree with that broad interpretation of the effect of the treaty provisions. In view of the definitive position taken by Congress, the various provisions of the treaty need not be examined further. The *Merry Cow/Crocker Bank* interpretation must be overturned.

VI

The Commissioner of Patents and Trademarks acted beyond his statutory authority in accepting the subject submissions as applications and forwarding them for examination. Because applicant has no application for a mark which meets the statutory requirements, applicant is not entitled to registrations either on the Principal or Supplemental Register.



WANG LABORATORIES, INC.,
Plaintiff/Cross-Appellant,

v.

TOSHIBA CORPORATION; Toshiba
America Electronic Components, Inc.;
Toshiba America Information Systems,
Inc., Defendants-Appellants,

and

NEC Corporation; NEC Electronics Inc.
and NEC Technologies, Inc.,
Defendants-Appellants,

and

Molex Incorporated, Defendant.
Nos. 92-1006, 92-1008 and 92-1025.

United States Court of Appeals,
Federal Circuit.

May 10, 1993.

Rehearing Denied; Suggestion for
Rehearing In Banc Declined
June 28, 1993.

Manufacturer of computer memory modules brought patent infringement action against two competitors. The United States District Court for the Eastern District of Virginia, Thomas Selby Ellis, III, J., entered judgment for patentee and awarded reasonable royalty as damages. Competitors appealed issues of validity and infringement, and patentee cross-appealed to amend judgment as to damages. The Court of Appeals, Lourie, Circuit Judge, held that: (1) competitors failed to show that claimed subject matter would have been obvious to person having ordinary skill in art at time inventions were made; (2) substantial evidence supported verdict that written description requirement for patents was met; (3) prosecution history estoppel barred patentee from enforcing its claims to infringement under doctrine of equivalents as applied to lateral and three-packed memory modules; and (4) district court abused its discretion in determining reasonable royalty rate from date of notice, rather than from date patent was issued.

Affirmed in part, reversed in part, and remanded in part.

Reasonably Pertinent to the Problem Solved by '090 Patent

B. Reasonably Pertinent To The Problem

32. A POSITA would not view Piepho as reasonably pertinent to the problem solved by the '090 patent. The '090 patent and Piepho are directed to different problems. The '090 patent concerns the problem of assembling and disassembling a wear sleeve from a main shaft of a gyratory crusher. (Ex. 1001, 1:51–2:9; *see also* Ex. 2027 (video showing the benefits provided by aspects of the invention, including increased safety and efficiency); *see also* Ex. 2011, 21:9–22:1 (Mr. Smith stating that the problem addressed by the '090 Patent is “the best ways for seating or assembling of the sleeve over the conical section of the main shaft.”).)

33. Piepho, on the other hand, addresses the problem of a coal pulverizer shaft failing due to fretting-induced bending fatigue at the joint between the yoke bushing and the main shaft. (Ex. 1018, 1:45–2:14.) As I discussed above, the wear components in Piepho are its balls and rings—not a sleeve (which Piepho does not disclose) or even its yoke bushing. There is also no discussion in Piepho on the yoke bushing being disassembled from the shaft or the yoke. Indeed, the reason that Piepho is concerned with *fretting-induced* fatigue is because the yoke bushing remains assembled with the main shaft, such that fretting wear would not be readily identifiable during machine maintenance.

Ex. 2022, ¶ 33

Mr. Smith

Q. Okay. I guess my question was a little bit different. It was, in your opinion, what problem is addressed by the invention of the 090 patent?

A. On a broad scale, I would probably say, that it's talking about how the -- what are the best ways for seating or assembling of the sleeve over the conical section of the main shaft.

Ex. 2011, 21:20-22:1

Piepho Interchangeability

The present invention provides an intervening material between the shaft end (25) and the mating bore in yoke bushing (18) fitted within the bore of yoke (12) to prevent fretting damage. For accurate alignment and for reliable support of the yoke, this joint (21) must be capable of accepting radial, axial, and bending or overturning loads. Preferably, the joint (21) is a tapered joint with the tapered end (25) of shaft (14). The yoke bushing (18) has a mating bore similarly tapered. Shaft end (25) may be constructed for either a keyless or a keyed fit. Also, shaft end (25) alternatively may be cylindrical rather than tapered as seen in FIG. 4.

Ex. 1018, 3:33-35

Mr. Smith: “Interchangeability”

36. Piepho teaches the interchangeability between a cylindrical joint and a tapered joint. Piepho also teaches that a tapered joint is preferable.

“The present invention provides an intervening material between the shaft end (25) and the mating bore in yoke bushing (18) fitted within the bore of yoke (12) to prevent fretting damage. For accurate alignment and for reliable support of the yoke, this joint (21) must be capable of accepting radial, axial, and bending or overturning loads.

Ex. 1051, ¶ 36

'090 Patent Conventional Mounting and Dismounting

and this cutting operation can be time and labour intensive with the added risk of potential damage to the shaft. Conventional mounting and dismounting procedures, due to the design of the main shaft and sleeve, are therefore disadvantageous in that they pose a risk of damage to the main shaft (and other components), injury to personnel and unacceptably long downtime of the crusher during repair and maintenance. Accordingly, what is required is a main shaft and main shaft assembly having a sleeve that addresses the above problems.

Ex. 1001, 1:51-59

'090 Patent Assembly and Disassembly

SUMMARY OF THE INVENTION

It is an objective of the present invention to provide a gyratory crusher main shaft and a main shaft assembly (having a sleeve) that enables convenient mounting and dismounting of the protective sleeve at the upper end of the shaft that obviates a requirement for excessive heating of the main shaft and the use of grinding and cutting apparatus that otherwise carries a risk of damage to the main shaft and injury to service personnel.

It is a further specific objective of the present invention to provide a main shaft and sleeve assembly that facilitates mounting and dismounting of the sleeve at the shaft via control of a pressurised fluid delivered to the region of an axially upper end of the shaft radially between the shaft and the sleeve.

Ex. 1001,
1:62-2:9

Piepho's Problem

Currently, there is some concern as to main shaft 14 failure. It is believed that the failures occur because of bending fatigue originating at fretted surfaces in the lower contact land with the yoke bushing bore. Fretting damage, sometimes referred to as fretting corrosion, is a condition of surface deterioration brought on by very small relative movements between bodies in contact. The fit between the yoke bushing and main shaft is an interference type fit. This type fit generates a stress concentration or multiplier. The pulverizer design generates cyclic or alternating type bending loads in the top end of the main shaft. Because the loads are cyclic, rubbing or fretting corrosion will occur. Also of concern is fatigue failure when stress concentration, cyclic loading and fretting corrosion are combined. Like fretting, fatigue has a definite set of characteristics which combine to identify this failure phenomenon. Pulverizer vibration usually results in high shaft stress levels and may have a role in main shaft failures. Vibration may be caused by abnormal grinding element wear such as out-of-round wear of balls or rings. Pulverizer vibration also will occur if proper air/fuel regulation for the burners is not provided.

Ex. 1018,
1:45-65

Piepho's Problem

Because of the foregoing, there have been many attempts to correct main shaft failure frequency such as employing an anti-seize compound at the taper joint, using a bushing with a undercut center portion, using full contact bushings with no undercut center portion, shot peening, and nitriding as a surface hardening process. Remedial efforts notwithstanding, even carefully fitted taper joints, when subjected to cyclic bending forces often exhibit vulnerability to fatigue failure of shafts because of fretting and strain produced within the assembly.

Ex. 1018, 1:65-2:8

Piepho's Problem

There still exists a need for an improved main shaft assembly for these types of pulverizers, one that will provide improved fretting resistance to reduce shaft failure due to fretting-induced bending fatigue on ball-race coal pulverizers.

Ex. 1018, 2:9-14

Alignment in Piepho

The present invention provides an intervening material between the shaft end (25) and the mating bore in yoke bushing (18) fitted within the bore of yoke (12) to prevent fretting damage. For accurate alignment and for reliable support of the yoke, this joint (21) must be capable of accepting radial, axial, and bending or overturning loads. Preferably, the joint (21) is a tapered joint with the tapered end (25) of shaft (14). The yoke bushing (18) has a mating bore similarly tapered. Shaft end (25) may be constructed for either a keyless or a keyed fit. Also, shaft end (25) alternatively may be cylindrical rather than tapered as seen in FIG. 4.

Ex. 1018, 3:27-29

Alignment in Piepho

elements. The pressure required for efficient grinding is obtained from externally adjustable dual purpose springs 10. The bottom ring 6 is driven by the yoke 12 which is attached to a vertical main shaft assembly 14 of the pulverizer. The top ring 4 is held stationary by the dual purpose springs 10. Raw coal is fed into the grinding zone where it mixes with partially ground coal that forms a circulating load. Pulver-

Ex. 1018, 1:25-26

Alignment in Piepho

35. Petitioner and Mr. Smith also emphasize that a tapered shaft aids in sleeve-shaft alignment. (Paper 33, 13; Ex. 1051, p. 67.) But fretting-induced fatigue—not yoke bushing-shaft alignment—is the problem on which Piepho focuses. Piepho does describe “accurate alignment” but that is with respect to the yoke—not the yoke bushing. (Ex. 1018, 3:27–29 (“For accurate alignment and for reliable support of the yoke, this joint (21) must be capable of accepting radial, axial, and bending or overturning loads.”).) The yoke must be aligned accurately to drive the pulverizer’s balls. (Ex. 1018, 1:25–26.) The yoke also has a much greater inertia than the yoke bushing, so the yoke is more susceptible to dynamic imbalance, and the resulting undesired vibration, than the yoke bushing. A cylindrical interference fit is at least equally capable of accurate alignment and load capacity as compared to the tapered fit. As discussed in my previous declaration, a tapered fit, in fact, has less load capacity for upward axial loads than a cylindrical interference fit. (See e.g., Ex. 2020, ¶¶ 16–35.) Thus, under either test, Piepho is not analogous art.

Ex. 2022, ¶ 35

Petitioner's Failure to Establish Analogous Art

Mr. Smith's Declaration Accompanying Opposition

13. In determining the scope and content of the prior art, I understand a reference is considered prior art for the obviousness analysis if it falls within the inventors' field of endeavor. Additionally, a reference is prior art for the obviousness analysis, even if from a different field of endeavor, if it is reasonably pertinent to the particular problem for which the invention was made. A reference is reasonably pertinent if it is something a person of ordinary skill in the art would have looked to when attempting to solve the problem.

Ex. 1051, ¶ 13

Must Compare Reference to Challenged Patent



“In evaluating whether a reference is analogous, we have consistently held that a patent challenger must compare the reference to the challenged patent.”

Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.,
66 F.4th 1373, 1377 (Fed. Cir. 2023)

Petition Compares to Polinski

As a rock crushing apparatus, Piepho is in the same field of endeavor as Polinski and thus (being analogous art) would easily be within the purview of a POSITA. Ex. 1002, at ¶ 85. Further, Piepho teaches the interchangeability between a cylindrical joint and a tapered joint. Ex. 1002, at ¶ 85. Piepho also teaches that a tapered joint is preferable. Ex. 1002, at ¶ 85.

Petition (Paper 2), 12

Mr. Smith's First Declaration: Comparing Piepho and Polinski

85. As a rock crushing apparatus, Piepho is in the same field of endeavor as Polinski and thus (being analogous art) would easily be within the purview of a POSITA. Further, Piepho teaches the interchangeability between a cylindrical joint and a tapered joint. Piepho also teaches that a tapered joint is preferable.

Ex. 1002, ¶ 85

Mr. Smith's Declaration Accompanying Opposition

US 8,302,754 to Yagi

46. US 8,302,754 to Katsuki Yagi (hereafter, the '754 patent, or Yagi) filed on July 23, 2009. This is also well in advance of the priority date of the '090 patent. Yagi is reasonably pertinent to one of the problems the inventor was trying to solve and is thus in the same field of endeavor.

Ex. 1051, ¶ 46

High Level Industry Label Insufficient



In *Clay*, the Court held that the prior art reference (Sydansk) “cannot be considered to be within Clay’s field of endeavor merely because both relate to the petroleum industry.”

In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992)



Allen-Bradley was not in the same field of endeavor “merely because it relates to memories.”

Wang Lab’ys, Inc. v. Toshiba Corp., 993 F.2d 858, 864 (Fed. Cir. 1993)

Mr. Smith's Assertion That Other References Were Reasonably Pertinent to the Problem Solved

US 8,302,754 to Yagi

46. US 8,302,754 to Katsuki Yagi (hereafter, the '754 patent, or Yagi) filed on July 23, 2009. This is also well in advance of the priority date of the '090 patent. Yagi is reasonably pertinent to one of the problems the inventor was trying to solve and is thus in the same field of endeavor.

Ex. 1051, ¶ 46

Mr. Smith's Assertion That Other References Were Reasonably Pertinent to the Problem Solved

US 2,381,697 to Shepard

56. US 2,381,697 to F. B. Shepard (hereinafter “Shepard”) was filed April 27, 1944 and is titled HUB STRUCTURE. Shepard relates to using a tapered sleeve to lock a pulley, gear, or the like onto a shaft and to facilitate release therefrom as well. Shepard is reasonably pertinent to the problem the inventor was trying to solve and is prior art.

Ex. 1051, ¶ 56

Mr. Smith's Assertion That Other References Were Reasonably Pertinent to the Problem Solved

US 2,377,046 to Siegerist

60. The US Patent 2,377,046 to Siegerist (hereinafter Siegerist) was filed on February 23, 1944. Siegerist is titled “Mounting for Sheaves and the Like” and is directed to ways of mounting and demounting components, such as a sleeve, on a shaft, and is reasonably pertinent to the problem the inventor of the '090 patent was trying to solve. Siegerist is prior art to the '090 Patent.

Ex. 1051, ¶ 60

Mr. Smith's Assertion That Other References Were Reasonably Pertinent to the Problem Solved

US 2,519,958 to Firth

64. The US Patent 2,519,958 to Firth (hereinafter Firth) was filed on November 21, 1947. Firth is titled “Wheel Mounting” and is directed to ways of mounting and demounting wheels or pulleys on a shaft, and is reasonably pertinent to the problem the inventor of the '090 patent was trying to solve. Firth is prior art to the '090 Patent.

Ex. 1051, ¶ 64

Mr. Smith's Assertion That Other References Were Reasonably Pertinent to the Problem Solved

US 2,668,454 to Schumb

68. The US Patent 2,668,454 to Schumb (hereinafter Schumb) was filed on October 22, 1952. Firth is titled “Mounting for Sprockets, Pinions or the Like” and is directed to ways of mounting and demounting sprockets or pinions on a shaft. Schumb specifically discloses mounting a pinion (Figure 4) on a tapered bushing on a shaft (Figure 5) and is reasonably pertinent to the problem the inventor of the '090 patent was trying to solve. Schumb is prior art to the '090 Patent.

Ex. 1051, ¶ 68

Mr. Smith's Limited Knowledge

Q. Okay. I want to ask you, as an expert in this field, how do you understand what happens to the coal once it exits the hopper, and goes towards the balls 8?

MR. SANKS: Objection; form.

THE WITNESS: So I'm not terribly familiar with that particular coal pulverizer. I've never seen one in person. I've used this particular reference to talk about the main shaft, and the tapered section of the main shaft. So I don't want to guess, and I don't particularly know. I don't specifically know exactly how it works, because it's not described in great detail in this reference.

Mr. Smith's Limited Knowledge

Q. (BY MR. ARJOMAND) Okay. All right. Let's direct your attention to the main shaft 14, since you just referenced that in your previous response. How does the main shaft 14 rotate in Piepho Figure 1? Maybe I should ask that question a little differently, because that was a little vague.

Looking at picture Piepho Figure 1, would a POSITA understand that the shaft 14 rotates about its longitudinal axis?

A. I don't think the Piepho referenced one way or the other. And I don't want to speculate as to whether it does or not. It's not something that I've actually looked at.

Ex. 2021,
65:23-66:4

Mr. Smith's Limited Knowledge

Q. So would it be fair to say, as you sit here today, you don't know what the role of yoke bushing 18 is, in Figure 1, in Piepho?

A. I don't know exactly how it's used in the prior art that's referenced in Piepho.

Ex. 2021, 71:11-15

No Motivation to Combine

Coxhill and Piepho

Non-Analogous Art → Hindsight



“The combination of elements from nonanalogous sources, in a manner that reconstructs the applicant’s invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness.”

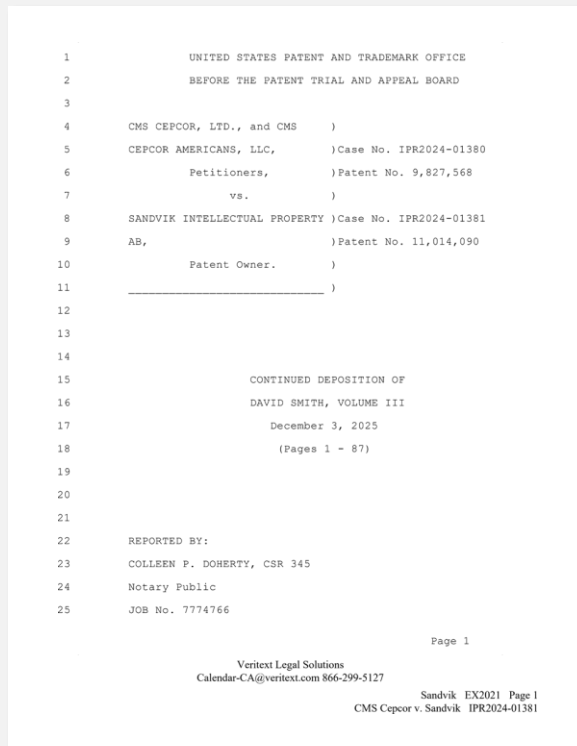
In re Oetiker, 977 F.2d 1443, 1447 (Fed. Cir. 1992)



“If [the reference] is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.

In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992)

Mr. Smith: Hindsight Driven Selection of Piepho



- Q.** Okay. I want to ask you, as an expert in this field, how do you understand what happens to the coal once it exits the hopper, and goes towards the balls 8?
- A.** So I'm not terribly familiar with that particular coal pulverizer. I've never seen one in person. I've used this particular reference to talk about the main shaft, and the tapered section of the main shaft. So I don't want to guess, and I don't particularly know. I don't specifically know exactly how it works, because it's not described in great detail in this reference.

Ex. 2021, 65:5-16

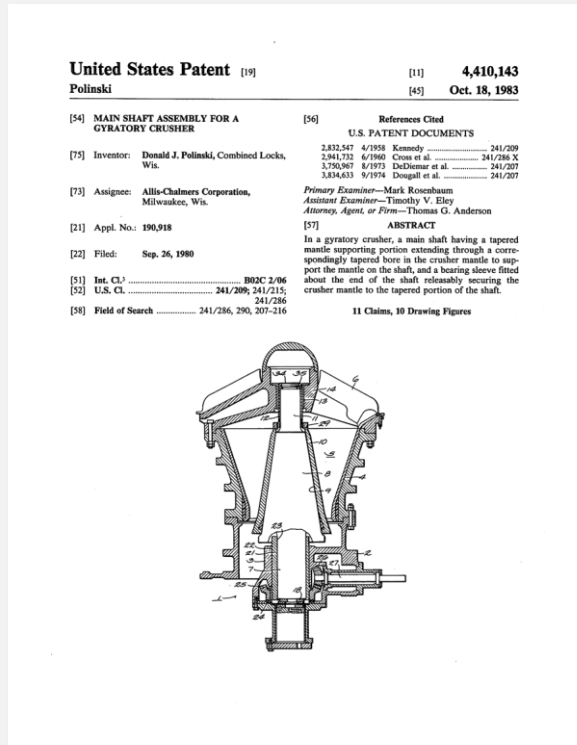
Piepho

The present invention provides an intervening material between the shaft end (25) and the mating bore in yoke bushing (18) fitted within the bore of yoke (12) to prevent fretting damage. For accurate alignment and for reliable support of the yoke, this joint (21) must be capable of accepting radial, axial, and bending or overturning loads. Preferably, the joint (21) is a tapered joint with the tapered end (25) of shaft (14). The yoke bushing (18) has a mating bore similarly tapered. Shaft end (25) may be constructed for either a keyless or a keyed fit. Also, shaft end (25) alternatively may be cylindrical rather than tapered as seen in FIG. 4.

Ex. 1018, 3:23–35

Fatigue Failure in Coxhill

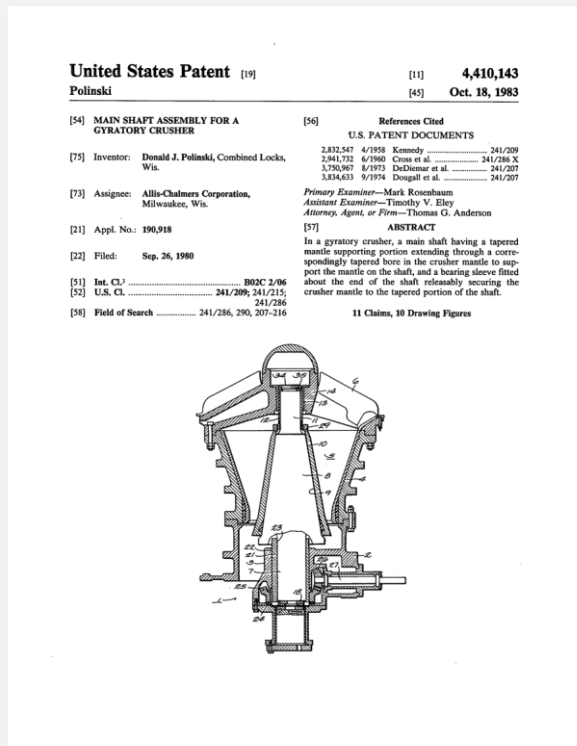
Coxhill Shaft Prone to Fatigue Failure



DESCRIPTION OF THE PRIOR ART

As exemplified by U.S. Pat. Nos. 2,883,218 and 4,034,922, a gyratory crusher typically includes a main shaft provided with a tapered portion which supports the crusher head or mantle through a correspondingly tapered internal bore extending through the mantle. To secure the mantle to the shaft, a threaded section has generally been provided on the shaft immediately above the tapered portion supporting the mantle for receiving a head nut which forces the mantle against the tapered portion of the shaft. While this type of arrangement has proven to be satisfactory for most crusher installations, experience has indicated that the relatively abrupt changes in the cross-sectional area of the shaft above and below the threaded section have resulted in high local stress concentrations in these regions of the shaft.

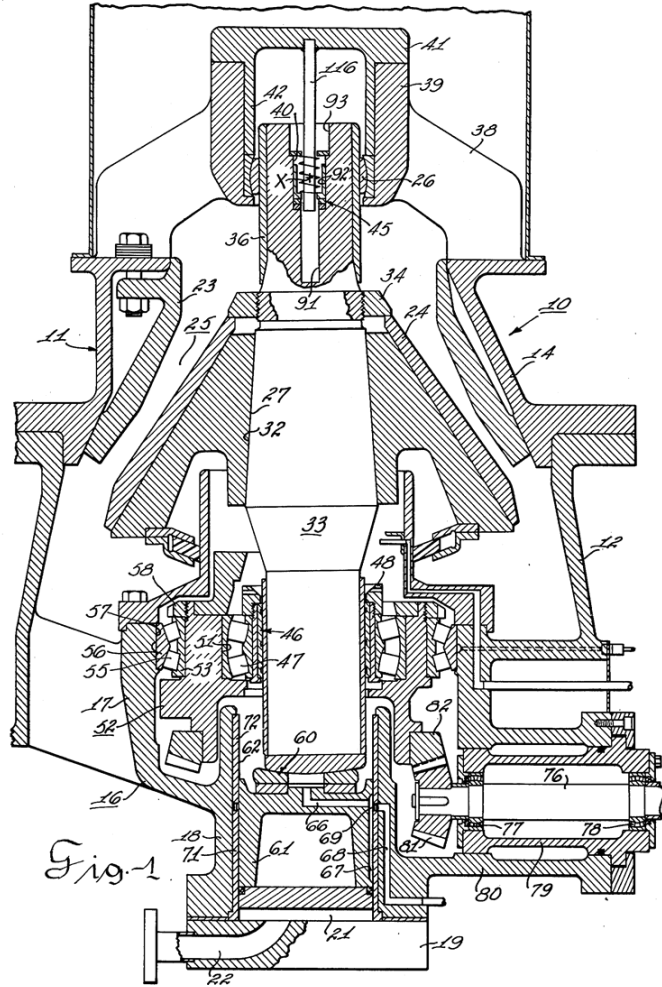
Coxhill Shaft Prone to Fatigue Failure



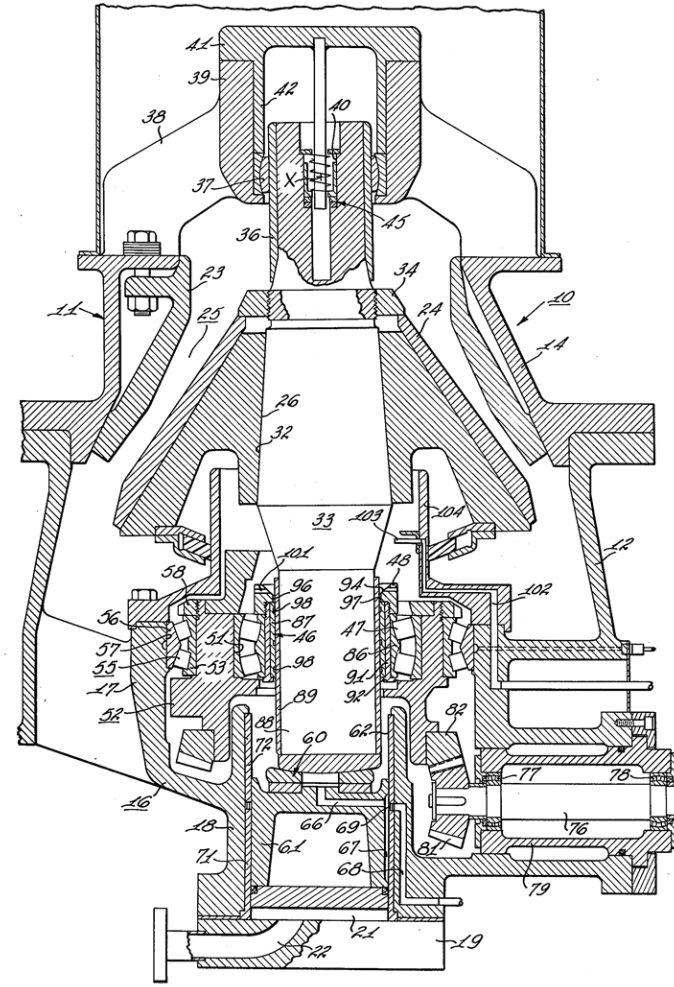
These stress concentrations are in addition to the substantial stresses generated by the cyclic bending loads applied to the shaft by the mantle during operation of the crusher. The result has been the development of fatigue cracks or fractures in the threaded section of the shaft as well as immediately above and below it where the highest stresses occur due to the abrupt changes in the cross-sectional area of the shaft. Over a period of time the cracks continue to grow and ultimately render the shaft unserviceable requiring that the crusher be taken out of service and the shaft replaced before crushing operations can be resumed. Similarly, if the manganese steel mantle works loose on the shaft due to localized work hardening which causes it to expand about the axis of the shaft, the rocking motion of the mantle can shear off the threads securing it to the shaft.

Ex. 1017, 1:11-37

Coxhill '922 & Coxhill '800



Ex. 1053, FIG. 1



Ex. 2023, FIG. 1

Mr. Smith Contradicting Polinski

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3
4
5 CMS CEPOR LTD., and CMS)
6 CEPOR AMERICAS LLC,) Case No. IPR2024-01380
7 Petitioner,) Patent No. 9,827,568
8 vs.)
9 SANDVIK INTELLECTUAL)
10 PROPERTY AB,) Case No. IPR2024-01381
11 Patent Owner.) Patent No. 11,014,090
12)
13
14
15
16 REMOTE DEPOSITION OF DAVID SMITH
17
18 VOLUME II
19
20 October 24, 2025
21
22
23
24
25 Reported by:
Vanessa S. Gosney, CSR #752, RPR
Page 1
Veritext Legal Solutions
Calendar-CA@veritext.com 866-299-5127
Sandvik EX2019 Page 1
CMS Cepcor v. Sandvik IPR2024-01381

Q. Mr. Smith, would a person of ordinary skill in the art understand that whatever forces are being exerted on the shaft via crushing head through nut 34 would result in failure of the shaft 33?

A. I haven't seen anything in Coxhill that 24 would suggest that this invention is prone to 25 failure. I would think it's been designed in a way that it works properly.

Ex. 2019, 61:18-62:1

B. A POSITA Would Not Be Motivated To Cut Oil Groove(s) Into Coxhill's Main Shaft

38. Petitioner's and Mr. Smith's proposed combination of Coxhill and

Yagi would require a POSITA to machine oil grooves into the external surface of

Coxhill's main shaft. A POSITA, however, would have understood that

introducing additional grooves into the Coxhill shaft could increase the risk of

catastrophic fatigue failure—a modification that a POSITA would not undertake

given his or her experience level. Thus, a POSITA would not have been motivated

to machine oil grooves into the external surface of Coxhill's main shaft.

Ex. 2022, ¶ 38

Dr. Kytömaa

39. As I have discussed at length in my previous declarations, Polinski—previously relied upon by Petitioner—describes that connecting a crushing head directly to the crusher main shaft via threads cut into the shaft has led to fatigue failure of the shaft. (Ex. 1017, 1:11–37.) Petitioner and Mr. Smith now rely upon U.S. Patent No. 4,037,800 to Coxhill (Ex. 1053, “Coxhill ’800”) as the base reference, as discussed above. Notably, however, the arrangement criticized by Polinski as leading to fatigue failure is identical to the shaft configuration disclosed in Coxhill ’800. More precisely, the criticized arrangement in Polinski corresponds to U.S. Patent No. 4,034,922 to Coxhill (“Coxhill ’922”). Coxhill ’922 and Coxhill ’800 disclose an essentially identical gyratory crusher, as shown by the substantially identical FIG. 1 embodiments in each patent, shown below. (See Ex. 1053; Ex. 2023.)

40. Additionally, the two patents share the same filing date, inventor, and assignee. A POSITA would have understood that the shaft-failure issues Polinski describes with respect to Coxhill '922 are equally present in Coxhill '800. Thus, as of the '090 Patent's filing date, it was already known that the shaft disclosed by Coxhill '800 was prone to fatigue failure. (Ex. 1017, 1:11–37.)

Ex. 2022, ¶ 40

Dr. Kytömaa

42. Although Mr. Smith, relied on Polinski as his primary reference in his first two declarations, he indicated that he had not “seen anything in Coxhill that would suggest that this invention is prone to failure,” and that he “would think it's been designed in a way that it works properly.” (Ex. 2019, 61:18-62:1.) However, Smith also noted that he understood Polinski’s discussion to indicate that “[i]n some instances, if it’s not designed properly, [using threads to attach the mantle] can result in fatigue cracking.” (Ex. 2011, 52:23-53:15.) Thus, Mr. Smith recognizes that Polinski teaches that some shafts may be designed such that fatigue cracking can arise due to stresses from attaching the mantle to the shaft via threads. Mr. Smith simply fails to recognize that Coxhill ’800 *is* such a shaft design criticized by Polinski. Thus, Mr. Smith’s assertions that a POSITA would modify Coxhill ’800 fail to account for the fact that Coxhill ’800’s shaft is prone to fatigue failure.

Coxhill '825 Considered by Examiner

United States Patent [19] **4,027,825**
Coxhill [45] **June 7, 1977**

[54] **GYRATORY CRUSHER ECCENTRIC ASSEMBLY REMOVAL SYSTEM**
[75] **Inventor:** Major Coxhill, Appleton, Wis.
[73] **Assignee:** Allis-Chalmers Corporation, Milwaukee, Wis.
[22] **Filed:** June 8, 1976
[21] **Appl. No.:** 693,781
[52] **U.S. Cl.:** 241/213; 241/215
[51] **Int. Cl.:** B02C 2/06
[58] **Field of Search:** 241/37.5, 207-216

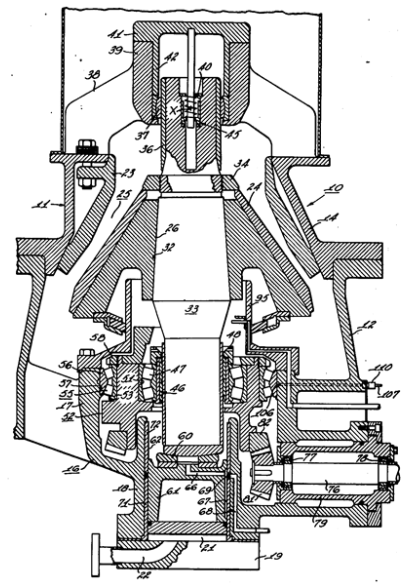
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2,833,486 5/1958 MacLeod 241/216 X
3,133,707 5/1964 Zimmerman 241/213 X
3,140,834 7/1964 Symons 241/216
3,539,119 11/1970 Cook 241/215

Primary Examiner—Roy Lake
Assistant Examiner—Howard N. Goldberg
Attorney, Agent, or Firm—Robert C. Jones

[57] **ABSTRACT**
Eccentric assembly removal is accomplished by operation of the crusher head shaft piston exerting an upward pushing force on the eccentric assembly and simultaneously applying high pressure fluid to the eccentric outer bearing housing.

9 Claims, 2 Drawing Figures



44. Although my previous testimony addressed the lack of motivation to add grooves to Polinski (E.g., Ex. 2020, ¶¶ 67–75), a POSITA—being aware of Polinski—would be more wary of adding grooves to the Coxhill shaft. Again, Polinski teaches that the Coxhill shaft was prone to fatigue failure. Polinski took steps to mitigate those failure problems, alleviating the risk of fatigue failure for the shaft in Polinski. (Ex. 1017, 61–67.) The shaft in Coxhill '800—lacking such mitigations—was at higher risk of failure than the shaft in Polinski, making the addition of oil grooves to the shaft a riskier endeavor in the eyes of a POSITA.

Ex. 2022, ¶ 44

46. However, the advantages of hydraulic processes Petitioner and Mr. Smith point to, in my opinion, would not have been sufficient to motivate a POSITA to introduce oil grooves into the main shaft disclosed by Coxhill in view of the known fatigue failure risk of the particular shaft in Coxhill. Indeed, during

Ex. 2022, ¶ 46

35 U.S.C. § 325(d)

(d) MULTIPLE PROCEEDINGS.—Notwithstanding sections 135(a), 251, and 252, and chapter 30, during the pendency of any post-grant review under this chapter, if another proceeding or matter involving the patent is before the Office, the Director may determine the manner in which the post-grant review or other proceeding or matter may proceed, including providing for the stay, transfer, consolidation, or termination of any such matter or proceeding. In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.

Claims 16 and 24

Claim 16

16. (Substitute for claim 2, if found unpatentable) The main shaft as claimed in claim 15, wherein the plurality of grooves comprise a first groove and a second groove, wherein the first groove is positioned closer to the second end relative to the second groove, and wherein the shaft body further comprises an oil path consisting of:

a fluid inlet positioned at the second end;

the first groove;

the second groove;

an axially extending channel indented at the external surface of the shaft body to couple the first groove and the second groove in fluid communication; and

an internal oil path extending within the shaft body only to the first groove, the internal oil path consisting of:

a first conduit extending axially toward the first end from the fluid inlet; and

a second conduit extending from the first conduit toward the radially outward facing external surface of the shaft body to the first groove

~~further comprising a fluid inlet conduit extending axially from the second end and provided in fluid communication with the at least one groove to allow a fluid to be supplied to the at least one groove from the second end.~~

Paper 28, 44

Claim 24

24. (Substitute for claim 12, if found unpatentable) The assembly as claimed in claim [[9]]21, wherein the at least one groove comprises a first groove and a second groove, wherein the first groove is positioned closer to the second end relative to the second groove, and wherein the shaft body further comprises an oil path consisting of:

a fluid inlet positioned at the second end;

the first groove;

the second groove;

an axially extending channel indented at the external surface of the shaft body to couple the first groove and the second groove in fluid communication; and

an internal oil path extending within the shaft body only to the first groove, the internal oil path consisting of:

a first conduit extending axially toward the first end from the fluid inlet; and

a second conduit extending from the first conduit toward the radially outward facing external surface of the shaft body to the first groove

~~further comprising a fluid inlet conduit extending axially from the second end of the shaft body in fluid communication with the at least one groove to allow a fluid to be supplied to the at least one groove from the second end of the shaft body.~~

Paper 28, 47-48

Fluid Flow Path

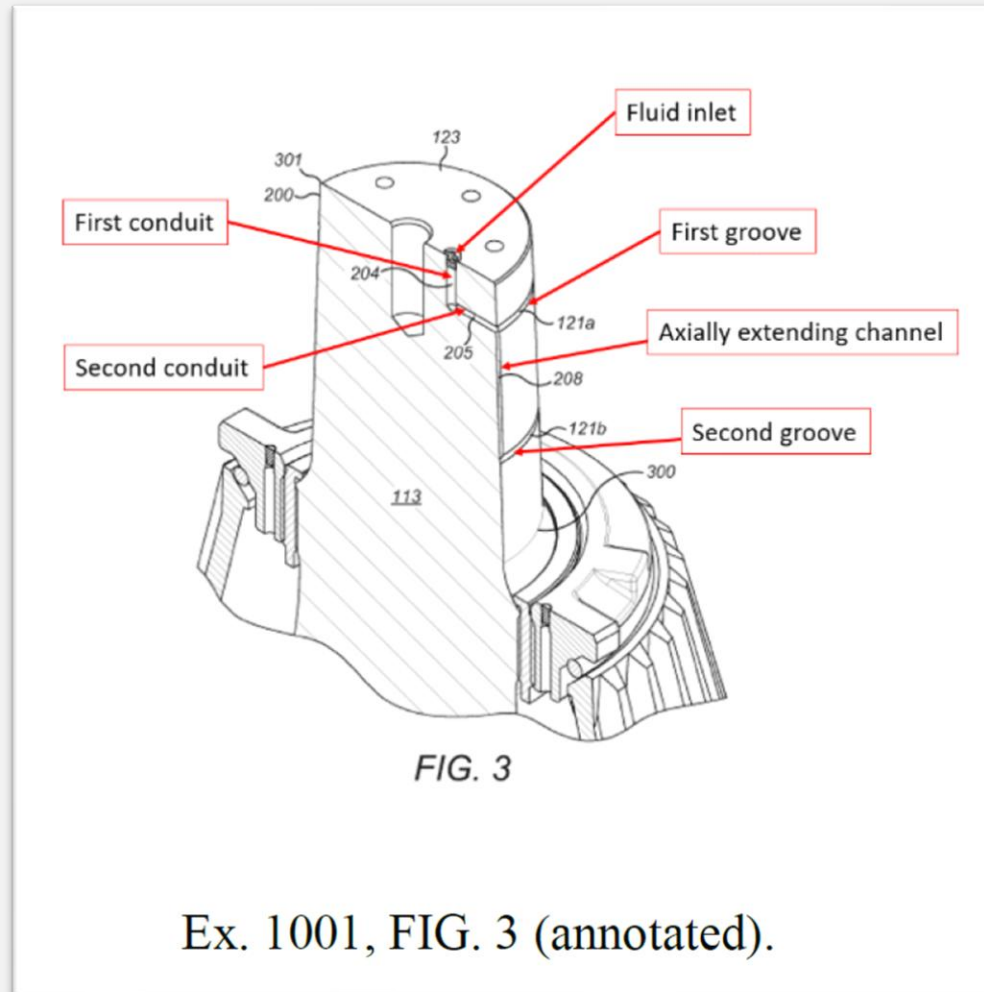


FIG. 1B

PRIOR ART

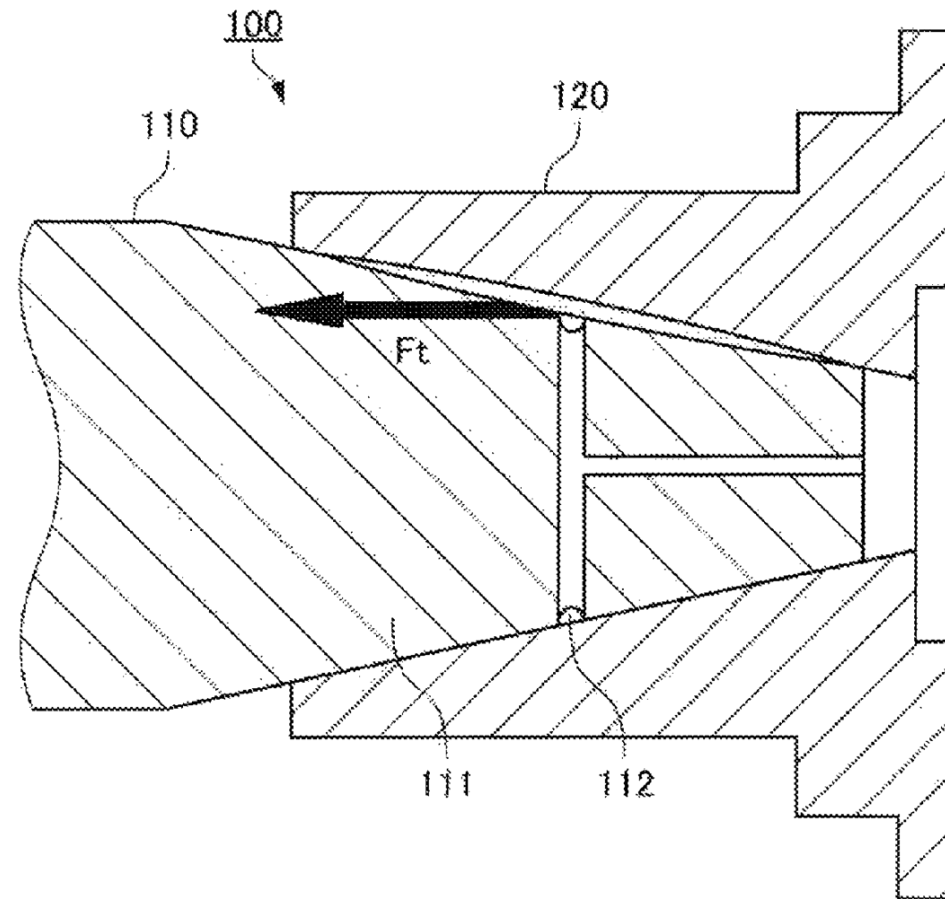


FIG. 3A

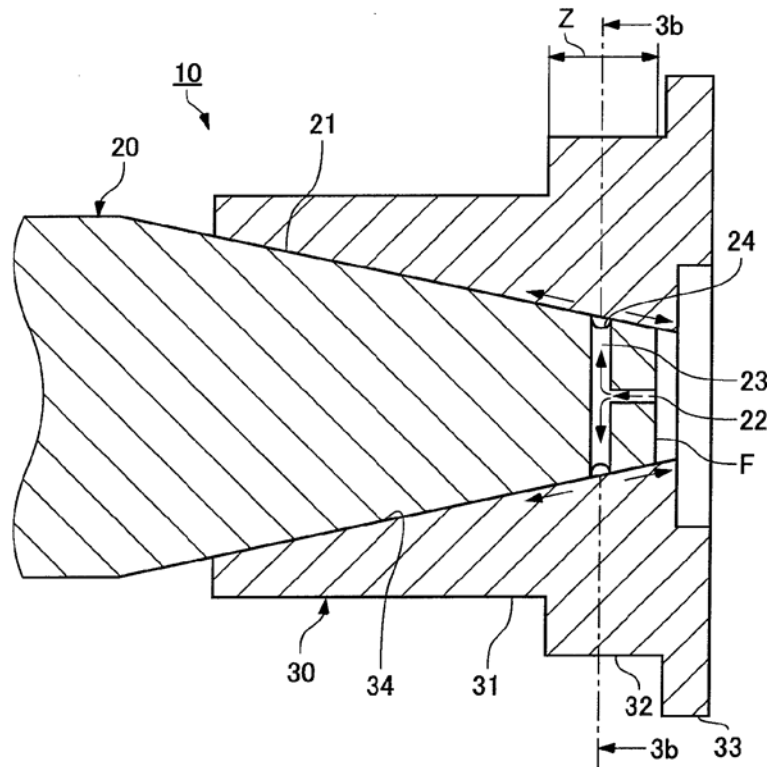
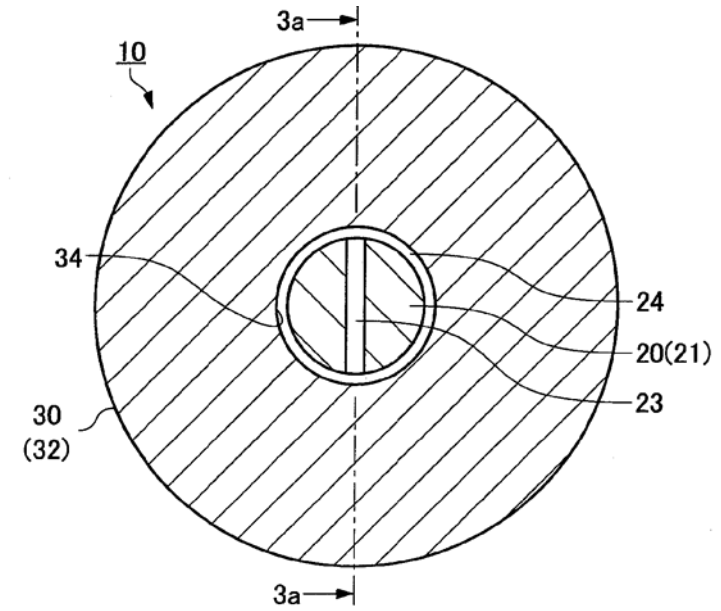
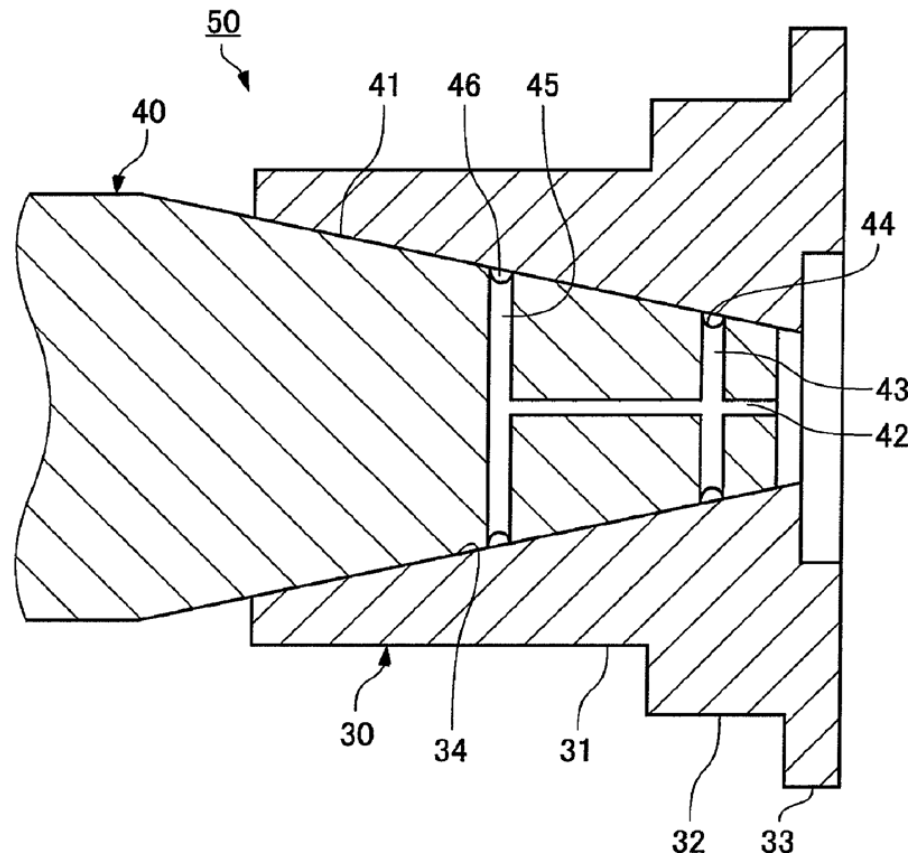


FIG. 3B



Ex. 1040, FIGS. 3A-3B

FIG. 4



Ex. 1040, FIG. 4

Yagi

FIG. 5A

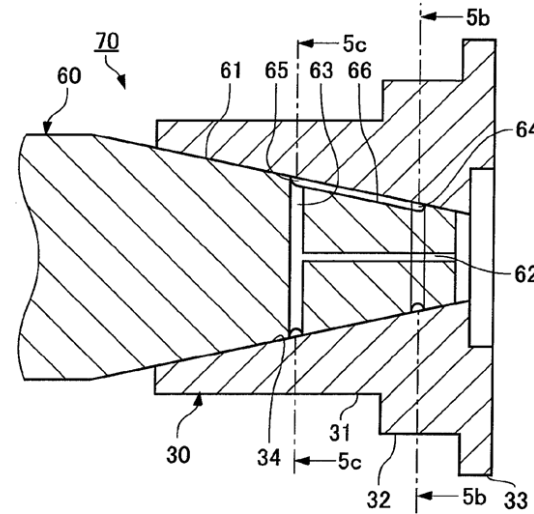


FIG. 5B

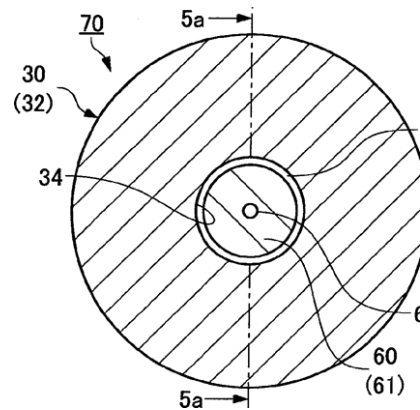
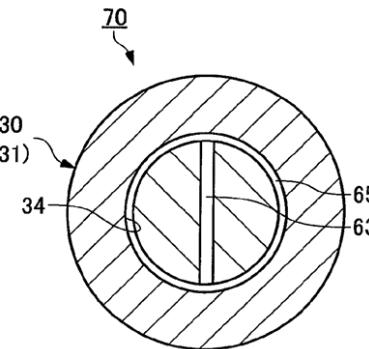


FIG. 5C



Ex. 1040, FIGS. 5A-5C

Petitioner on Yagi

Claim 16 has been revised, in part, shown in Ex. 1055. In general, a POSITA would recognize that Coxhill in view of Piepho and Yagi renders this limitation obvious. Yagi discloses an oil path consisting of a fluid inlet positioned at the second end, the first groove, the second groove, an axially extending channel indented at the external surface of the shaft body to couple first groove and the second groove in fluid communication. In one embodiment Yagi teaches an internal oil path that extends only to the first groove, and in another embodiment teaches an internal oil path that extends to the second groove. The design choice to port to one or the other grooves does not make any material difference to the functionality of the device and is merely a design decision. At the very least the specific oil path described in this element would be obvious to try as it is choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

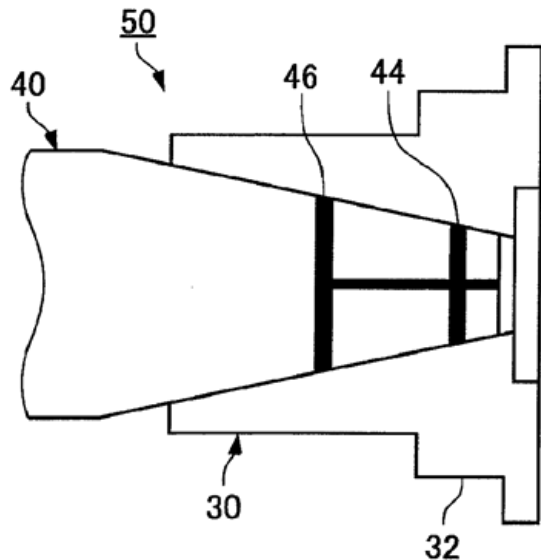
Dr. Kytömaa on Yagi

52. Petitioner’s suggestion that Yagi “includes each feature in the claim, but ports to the second groove rather than the first” is an admission that the Yagi’s internal path terminates in a different groove than the one claimed—Yagi’s structure is thus inconsistent with the claimed “consisting of” limitation. Importantly, neither Petitioner nor Mr. Smith identifies any figure or passage in Yagi that actually discloses an internal passage routed to only the first groove, as claimed. Petitioner’s assertion that “[i]n one embodiment Yagi teaches an internal oil path that extends only to the first groove” is unsupported by any citation to such an embodiment because none exists where Yagi also contemplates multiple grooves. (Paper 33, 15.) Where Yagi contemplates multiple grooves, it always teaches to include a fluid path to the second groove.

Dr. Kytömaa on Yagi

53. Petitioner and Mr. Smith also rely on Yagi’s FIG. 6B and the statement that “oil is fed from the first oil groove 44 only.” But FIGS. 6A–6C do not depict a new shaft fluid-path architecture. They depict a procedure for decoupling the tapered shaft 40 from the hub 30 in the second embodiment (the embodiment having two radial passages 43 and 45 that each port to a respective one of the two circumferential grooves). (See Ex. 1040, 7:37–57.) This procedure does not meet the claim limitations. The claims recite a specific structure, not a procedure. They require that the internal oil path itself extend “only to the first groove” and “consist of” a single axial conduit and a single radial conduit to that groove. The second embodiment of Yagi, even when used according to the FIG. 6B procedure, still has an internal path extending to both grooves, does not have an axial channel connecting the grooves at the shaft surface, and thus cannot satisfy claim 16 or 24.

FIG. 6A



Ex. 1040, FIG. 6A

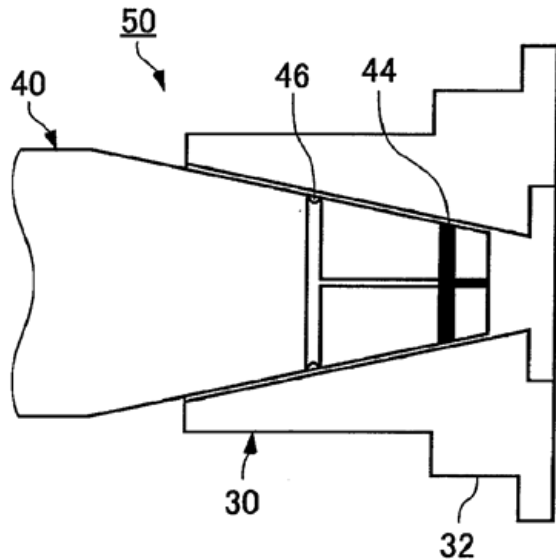
Fourth Embodiment

Regarding the coupling structure **50** shown as the second embodiment, a preferred procedure for decoupling the tapered shaft **40** from the hub **30** is explained with reference to FIGS. 6A, 6B and 6C.

The coupling structure **50** comprises the first oil groove **44** and the second oil groove **46**. When the tapered shaft **40** is decoupled from the hub **30**, oil can be fed from both of the first oil groove **44** and the second oil groove **46** from beginning to end of the decoupling, and also the feed of oil from the first oil groove **44** or the second oil groove **46** can be stopped depending on the stage of decoupling.

As shown in FIG. 6A, at the decoupling start time, since the surface pressure P received from the hub **30** by the tapered shaft **40** is the highest, oil is fed from both of the first oil groove **44** and the second oil groove **46**. By doing this, the tapered shaft **40** and the hub **30** are moved relatively in the decoupling direction. In FIGS. 6A, 6B and 6C, the region to which oil is fed is painted over in black.

FIG. 6B

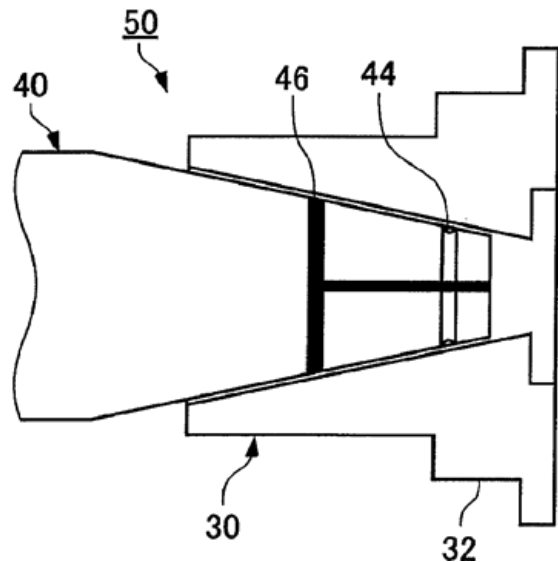


Ex. 1040, FIG. 6B

Next, as shown in FIG. 6B, the feed of oil from the second oil groove 46 is stopped, and oil is fed from the first oil groove 44 only. After oil has been fed from both of the first oil groove 44 and the second oil groove 46, decoupling can be performed relatively easily. However, to the region corresponding to the high-rigidity part 32, oil is fed from the first oil groove 44 because the surface pressure P thereof is high.

Ex. 1040, 7:44-50

FIG. 6C



Ex. 1040, FIG. 6C

Next, as shown in FIG. 6C, the feed of oil from the first oil groove 44 is stopped, and the feed of oil from the second oil groove 46 is restarted. As the tapered shaft 40 and the hub 30 move relatively in the decoupling direction, the surface pressure P from the high-rigidity part 32 decreases. Therefore, to give priority to the permeation of oil in the axial direction as far as possible, oil is fed from the second oil groove 46.

Ex. 1040, 7:51-57

Design Choice

Claim 16 has been revised, in part, shown in Ex. 1055. In general, a POSITA would recognize that Coxhill in view of Piepho and Yagi renders this limitation obvious. Yagi discloses an oil path consisting of a fluid inlet positioned at the second end, the first groove, the second groove, an axially extending channel indented at the external surface of the shaft body to couple first groove and the second groove in fluid communication. In one embodiment Yagi teaches an internal oil path that extends only to the first groove, and in another embodiment teaches an internal oil path that extends to the second groove. The design choice to port to one or the other grooves does not make any material difference to the functionality of the device and is merely a design decision. At the very least the specific oil path described in this element would be obvious to try as it is choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Design Choice

Optionally, at least a part of the conduit is indented and extends axially at the external surface as a channel. The channel may preferably extend axially at the external surface between a plurality of grooves to couple the grooves in fluid communication. Such an arrangement is advantageous to reduce the axial length of any internal bore through the main shaft. Minimising an axial length of an internally extending fluid supply conduit is advantageous during manufacture as the use of very long and thin drills should be avoided. A channel or groove indented on the external surface of the main shaft is therefore more convenient and efficient for manufacture.

Ex. 1001, 3:2-13

Dr. Kytömaa on Design Choice

B. The Claimed Oil Path Is Not A Mere Design Choice

54. Petitioner asserts that “the design choice to port to one or the other grooves does not make any material difference to the functionality of the device and is merely a design decision.” (Paper 33, 15.) Mr. Smith similarly asserts that “the choice to run the fluid path to either the first or second grooves is merely a design decision,” reasoning that the “choice will not affect the intended purpose to assist in removal of the sleeve in any way.” (Ex. 1051, 77–81.) In so concluding, Petitioner and Mr. Smith fail to acknowledge the significant improvement in manufacturability provided by the claimed oil path. In addition to the fact that “[m]inimizing an axial length of an internally extending fluid supply conduit is advantageous during manufacture as the use of very long and thin drills should be avoided” (Ex. 1001, 3:6–9), the shorter internal bore also provides additional functional benefits by requiring less oil volume is to fill the system.

Dr. Kytömaa on Design Choice

55. An internal oil flow path that extends only to the topmost groove, as recited in claims 16 and 24, would have less internal volume relative to an oil path that extends to the lower groove and then feeds the upper groove downstream via an axial channel in the external surface of the shaft. Consequently, the total amount of residual oil to be cleaned up following separation of the sleeve would also be less than for an oil path in which the internal flow path extends to the lower groove. In addition to the reduced oil cleanup, a smaller oil volume reduces the time to fill the oil grooves with the manual pump (hydraulic oil pump 11) shown in Sandvik's Maintenance Instructions below. Both of these benefits combine to reduce the time required to replace the shaft sleeve.

Dr. Kytömaa on Design Choice

57. Moreover, in concluding that the claimed configuration of the internal oil path is merely a “design choice,” Mr. Smith has failed to satisfy his own criteria that the claim recites a “known way[] that [has] been used in prior art.” Neither Mr. Smith nor Petitioner have identified anything in the relied upon art that discloses the claimed configuration—thus, Mr. Smith and Petitioner have not demonstrated that the claimed configuration was a “known way[] that [has] been used in prior art.”

Ex. 2022, ¶ 57

Design Choice



FEDERAL REPORTER, 3d SERIES

and required that both plates be made by sequentially interposing colored filters.

Donnelley argues that the prosecution history of the '241 patent shows that Mark I surrendered claim coverage for a process not involving sequential interposition of colored filters. We agree. The prosecution history demonstrates that Mark I was unsuccessful in obtaining allowance of the claims until they were narrowed to require that both the first and the second printing plates be made by sequentially interposing particular combinations of colored filters. Moreover, during prosecution Mark I asserted that the claims were patentably distinguishable over the prior art based on these process steps. Thus, in our view a competitor reviewing the prosecution history of the '241 patent reasonably would conclude that, in order to procure issuance of the patent, Mark I surrendered claim coverage to a process not involving sequential interposition of filters.

[9] The fact that the claims of the '859 application were not themselves rejected by the Patent Office or amended by Mark I does not call for a different result. Mark I chose to file continuing applications with successively narrower claims in lieu of otherwise responding to the PTO's rejections, but an estoppel is not avoided by failing to respond to a rejection and instead meeting the substance of the rejection by filing a narrower continuing application. Rather, the prosecution history must be viewed as a whole to determine whether and what subject matter was surrendered to procure issuance of the patent. Viewed in its entirety, the prosecution history of the '241 patent clearly shows that Mark I surrendered claim coverage in order to obtain an allowance of the claims.

[10] Mark I argues that, at a minimum, the question of prosecution history estoppel raises genuine issues of material fact precluding a grant of summary judgment. We disagree. The relevant facts here are undisputed; the prosecution history of the '241 patent is a matter of public record. Moreover, the meaning of the prosecution history is clear. A competitor reviewing the '241 patent's prosecution history would not have to go beyond the public record to reasonably conclude that Mark I had relinquished claim

coverage for a process not involving sequentially interposing colored filters.

[11] We therefore hold that Mark I is estopped from asserting infringement by any process that does not involve a sequential interposition of colored filters. The accused process indisputably does not involve the sequential interposition of filters; rather, three light beams are simultaneously filtered through red, green, and blue filters within the scanner. Thus, no reasonable fact-finder could find that the accused process infringes the '241 patent; summary judgment of noninfringement was therefore appropriate. See *Brenner v. United States*, 773 F.2d 306, 307, 227 USPQ 159, 160 (Fed.Cir.1985) (Summary judgment of noninfringement will be upheld on appeal when there is no literal infringement "and a prosecution history estoppel makes clear that no actual infringement under the doctrine of equivalents can be found").

Because the prosecution history estoppel issue is dispositive, we need not decide whether the district court correctly ruled that Mark I failed to dispute Donnelley's contention that its process is prior art to the '241 patent.

CONCLUSION

The district court's grant of summary judgment of noninfringement in favor of Donnelley is affirmed.

AFFIRMED.



In re Paul CHU, William Downs, John B. Doyle and Peter V. Smith.

No. 95-1038.

United States Court of Appeals,
Federal Circuit.

Sept. 14, 1995.

Applicants appealed decision of Board of Patent Appeals and Interferences, affirming

From the totality of the record, we hold that placement of the SCR catalyst within the bag retainer would not have been merely a matter of “design choice.” First, there is no teaching or suggestion in the prior art that would lead one of ordinary skill in the art to modify the Szymanski structure to place the SCR catalyst within a bag retainer as opposed to between two filter bags as disclosed in Szymanski. Next, Chu’s technical evidence relating to the frailty of fabric filters during pulse-jet cleaning clearly counters the assertion that placement of the catalyst in the baghouse is merely a “design

choice.” Specifically, Chu’s evidence regarding the violent “snapping” action during pulse-jet cleaning, the difficulty in stitching compartments including the capacity to withstand high temperatures, and problems encountered from variable path lengths due to settling of the catalyst particles in each compartment militates against a conclusion that placement of the SCR catalyst is merely a “design choice.” See *In re Gal*, 980 F.2d 717, 25 USPQ2d 1076 (Fed.Cir.1992) (finding of “obvious design choice” precluded where the claimed structure and the function it performs are different from the prior art).

In re Chu, 66 F.3d 292, 298-299 (Fed. Cir. 1995)

Design Choice



“Merely stating that a particular placement of an element is a design choice does not make it obvious.”

Cutsforth, Inc. v. MotivePower, Inc., 636 Fed. Appx. 575, 578 (Fed. Cir. 2016)

Obvious to Try

Claim 16 has been revised, in part, shown in Ex. 1055. In general, a POSITA would recognize that Coxhill in view of Piepho and Yagi renders this limitation obvious. Yagi discloses an oil path consisting of a fluid inlet positioned at the second end, the first groove, the second groove, an axially extending channel indented at the external surface of the shaft body to couple first groove and the second groove in fluid communication. In one embodiment Yagi teaches an internal oil path that extends only to the first groove, and in another embodiment teaches an internal oil path that extends to the second groove. The design choice to port to one or the other grooves does not make any material difference to the functionality of the device and is merely a design decision. At the very least the specific oil path described in this element would be obvious to try as it is choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Obvious to Try

C. The Claimed Oil Path Would Not Have Been Obvious To Try

58. Petitioner and Mr. Smith have not identified any finite set of porting options, nor has Petitioner or Mr. Smith shown that the claimed arrangement was an “identified, predictable solution” at the time of the '090 patent’s filing date.

Yagi describes a broad range of options for introducing oil between a shaft and hub, none of which correspond to the claimed oil flow path. Moreover, as I discussed above, the oil path recited in claims 16 and 24 provides several manufacturing and operational benefits. Thus, it would not have been obvious to try the claimed arrangement.

Ex. 2022, ¶ 58

Obvious to Try



ROLLS-ROYCE, PLC v. UNITED TECHNOLOGIES CORP. 1325
Cite as 603 F.3d 1325 (Fed. Cir. 2010)

Abbott Labs. v. Sandoz, Inc., 544 F.3d 1341, 1356 (Fed.Cir.2008) (“Materiality is not evidence of intent. . . .”). Although materiality and intent are separate inquiries, both of which must be proven, it may often be the case that a district court finds the same evidence of materiality probative for both prongs of the analysis. Thus, it is not that a high level of materiality lowers the threshold evidentiary burden for an inference of intent, but rather, that a high level of materiality is circumstantial evidence of intent that brings the challenger closer to satisfying his burden.

Because, drawing all justifiable inference in favor of Optimum, the facts of this case cannot support an inference of intent to deceive, I concur with the majority in affirming the district court’s grant of summary judgment of no inequitable conduct. I depart from the majority only to the extent that the majority opinion characterizes materiality as irrelevant to an inference of intent.



ROLLS-ROYCE, PLC,
Plaintiff-Appellee,
v.
UNITED TECHNOLOGIES
CORPORATION, Defendant-Appellant.
No. 2009-1307.

United States Court of Appeals,
Federal Circuit.
May 5, 2010.

Rehearing and Rehearing En Banc
Denied June 23, 2010.

Background: Holder of patent related to swept fan blades used on turbofan jet engines filed suit challenging decision by Board of Patent Appeals and Interferences, construing patent claims, finding interference-in-fact with reissue application of senior party patent assignee, and entering final judgment for assignee. After

bench trial, the United States District Court for the Eastern District of Virginia, Leonie M. Brinkema J., reversed. Assignee appealed.

Holding: The Court of Appeals, Rader, Circuit Judge, held that no interference-in-fact resulted from patent that would not have been obvious in light of prior reissue application.
Affirmed.

1. Patents $\Rightarrow$ 114.16, 114.22

In an appeal of a patent interference action, Court of Appeals reviews the district court’s factual findings for clear error and its conclusions of law de novo. 35 U.S.C.A. § 146.

2. Patents $\Rightarrow$ 106(2)

Pending claims in interference proceedings are given their broadest reasonable construction in light of the specification.

3. Patents $\Rightarrow$ 101(2)

“Translated forward,” in claim for patent related to swept fan blades used on turbofan jet engines, meant moved forward toward axial direction.

4. Patents $\Rightarrow$ 165(4)

Although reluctant to exclude an embodiment of a patent, Court of Appeals must not allow the disclosed embodiment to outweigh the language of the patent claim, especially when the court’s construction is supported by the intrinsic evidence.

5. Patents $\Rightarrow$ 101(2)

“A sweep angle that causes the blade to intercept the shock,” in claim for patent related to swept fan blades used on turbofan jet engines, meant rearward sweep angle in outer region that was constant or decreasing.

[11, 12] Based on the same evidence, UTC argues that an ordinarily skilled artisan would have found it obvious to try to reverse the sweep angle from rearward to forward sweep in the outer region in order to intercept the endwall shock. To determine that an invention would have been obvious to try on the basis of the record before the time of invention, this court has clarified, with respect to inventions requiring selection of a species from a disclosed genus, that the possible approaches and selection to solve the problem must be “known and finite.” See *Abbott*, 544 F.3d at 1351 (holding as conditions in which “obvious to try” may negate patentability, “the problem is known, the possible approaches to solving the problem are known and finite, and the solution is predictable through use of a known option”). The

1352. In this case, the broad selection of choices for further investigation available to a person of ordinary skill included any degree of sweep. See *Takeda*, 492 F.3d at 1359 (holding the invention not obvious to try because the prior art disclosed a broad selection of compounds that an ordinarily skilled artisan could have selected for further investigation). Also, the record does

Rolls-Royce, PLC v. United Techs. Corp.,
603 F.3d 1325, 1339 (Fed. Cir. 2010).

Appendix

Substitute Claims

15. (Substitute for claim 1, if found unpatentable) A gyratory crusher main shaft of a crusher comprising:

[15a] a shaft body having a radially outward facing external surface, and a first end and a second end, wherein the second end is an uppermost extremity of the shaft body;

[15b] an axial region of the shaft body extending from the second end and being tapered relative to a longitudinal axis of the shaft body such that a cross sectional area of the shaft body at the tapered axial region decreases in a direction from the first end to the second end;

[15c] a shaft sleeve mounted on the tapered axial region; and

[15d] ~~at least one groove~~ a plurality of grooves indented at the external surface and positioned at the tapered axial region, the ~~at least one groove~~ plurality of grooves being arranged to receive a pressurized fluid to facilitate mounting and dismounting of the shaft sleeve at the shaft body.

Paper 28, 43

Substitute Claims

16. (Substitute for claim 2, if found unpatentable) The main shaft as claimed in claim 15, wherein the plurality of grooves comprise a first groove and a second groove, wherein the first groove is positioned closer to the second end relative to the second groove, and wherein the shaft body further comprises an oil path consisting of:

a fluid inlet positioned at the second end;

the first groove;

the second groove;

an axially extending channel indented at the external surface of the shaft body to couple the first groove and the second groove in fluid communication; and

an internal oil path extending within the shaft body only to the first groove, the internal oil path consisting of:

a first conduit extending axially toward the first end from the fluid inlet; and

a second conduit extending from the first conduit toward the radially outward facing external surface of the shaft body to the first groove

~~further comprising a fluid inlet conduit extending axially from the second end and provided in fluid communication with the at least one groove to allow a fluid to be supplied to the at least one groove from the second end.~~

Paper 28, 44

Substitute Claims

17. (Substitute for claim 3, if found unpatentable) The main shaft as claimed in claim [[2]]16, wherein the first groove is positioned on a first side of a cross-sectional area center of the shaft sleeve relatively closer to the second end and the second groove is positioned on a second side of a cross-sectional area center of the shaft sleeve relatively further from the second end ~~wherein the fluid inlet conduit extends internally within the shaft body such that a part of the fluid inlet conduit extends radially outward to the at least one groove.~~

18. (Substitute for claim 4, if found unpatentable) The main shaft as claimed in claim [[3]]15, wherein the ~~at least one groove~~ plurality of grooves extend[[s]] in a circumferential direction around the tapered axial region shaft body.

19. (Substitute for claim 5, if found unpatentable) The main shaft as claimed in claim [[4]]18, wherein the ~~at least one groove~~ plurality of grooves extend[[s]] substantially or completely circumferentially around the shaft body.

20. (Substitute for claim 8, if found unpatentable) The main shaft as claimed in claim [[7]]15, wherein the shaft sleeve is configured such that when positioned on the shaft body, the shaft sleeve is separated from and not fastened to a crushing head and a crushing shell ~~wherein at least a part of the fluid inlet conduit is indented and extends axially at the external surface as a channel to couple the first and second grooves in fluid communication.~~

Paper 28, 45

Substitute Claims

21. (Substitute for claim 9, if found unpatentable) A gyratory crusher main shaft assembly for a crusher comprising:

[21a] a shaft body having a radially outward facing external surface, and a first end and a second end, wherein the second end is an uppermost extremity of the shaft body;

[21b] an axial region of the shaft body extending from the second end and being tapered relative to a longitudinal axis of the shaft body such that a cross sectional area of the shaft body at the tapered axial region decreases in a direction from the first end to the second end,

[21c] a shaft sleeve mounted on the tapered axial region, and

[21d] at least one groove indented at the external surface and positioned at the tapered axial region, the at least one groove being arranged to receive a pressurized fluid to facilitate mounting and dismounting of the sleeve at the shaft body, ~~and~~

[21e] wherein the [[a]] shaft sleeve is fitted over the tapered axial region, the shaft sleeve having a tapered wall thickness, such that the wall thickness at a second end of the shaft sleeve is greater than the wall thickness at a first end of the sleeve, wherein the first end of the shaft sleeve is a lowermost extremity of the shaft sleeve.

Paper 28, 46

Substitute Claims

22. (Substitute for claim 10, if found unpatentable) The assembly as claimed in claim ~~[[9]]~~21, further comprising an end retainer releasably mounted at the second end of the shaft body and having a perimeter region extending radially outward beyond the external surface at the tapered region, the perimeter region positioned to radially overlap the sleeve at the second end of the sleeve to inhibit axial separation of the sleeve from the shaft body.

23. (Substitute for claim 11, if found unpatentable) The assembly as claimed in claim ~~[[10]]~~22, wherein the end retainer includes a recess extending circumferentially at the perimeter region to allow axial movement of the sleeve into the recess.

Paper 28, 47

Substitute Claims

24. (Substitute for claim 12, if found unpatentable) The assembly as claimed in claim [[9]]21, wherein the at least one groove comprises a first groove and a second groove, wherein the first groove is positioned closer to the second end relative to the second groove, and wherein the shaft body further comprises an oil path consisting of:

a fluid inlet positioned at the second end;

the first groove;

the second groove;

an axially extending channel indented at the external surface of the shaft body to couple the first groove and the second groove in fluid communication; and

an internal oil path extending within the shaft body only to the first groove, the internal oil path consisting of:

a first conduit extending axially toward the first end from the fluid inlet; and

a second conduit extending from the first conduit toward the radially outward facing external surface of the shaft body to the first groove

~~further comprising a fluid inlet conduit extending axially from the second end of the shaft body in fluid communication with the at least one groove to allow a fluid to be supplied to the at least one groove from the second end of the shaft body.~~

Paper 28, 47-48

Substitute Claims

25. (Substitute for claim 13, if found unpatentable) The assembly as claimed in claim ~~[[9]]~~21, wherein the shaft sleeve is configured such that when positioned on the shaft body, the shaft sleeve is separated from and not fastened to a crushing head and a crushing shell ~~further comprising a fluid inlet conduit extending radially through the wall thickness of the sleeve in fluid communication with the at least one groove to allow a fluid to be supplied to the at least one groove through the sleeve.~~

Paper 28, 48

Substitute Claims

26. (Substitute for claim 14, if found unpatentable) A gyratory crusher comprising:

[26a] a main shaft including a shaft body having a radially outward facing external surface, a first end for positioning at a lower region of the crusher and a second end for positioning at an upper region of the crusher relative to the first end, wherein the second end is an uppermost extremity of the shaft body,

[26b] an axial region of the shaft body extending from the second end and being tapered relative to a longitudinal axis of the shaft body such that a cross sectional area of the shaft body at the tapered axial region decreases in a direction from the first end to the second end, the tapered axial region being configured to mount a shaft sleeve;

[26c] a sleeve fitted over the tapered axial region, the sleeve having a tapered wall thickness such that a wall thickness at a second upper end of the sleeve is greater than a wall thickness at a first lower end of the sleeve, wherein the first end of the sleeve is a lowermost extremity of the sleeve; and

[26d] at least one groove indented at the external surface and positioned at the tapered axial region, the at least one groove being arranged to receive a pressurized fluid to facilitate mounting and dismounting of the sleeve at the shaft body,

[26e] wherein the sleeve is configured such that when positioned on the shaft body, the sleeve is separated from and not fastened to a crushing head and a crushing shell.

Paper 28, 48-49

Opposition to Motion to Exclude

“Ideal”

17. A coal pulverizer and a gyratory crusher are very different machines. The embodiments, functions, and structure of the coal pulverizer described in Piepho are not analogous to the embodiments, functions and structure of the gyratory crusher as described in the ‘568 patent. For example, the size of the coal supplied to a B&W Type EL coal pulverizer, the type described in Piepho, should ideally be 0.75 to 1 inch and the output pulverized coal particle sizes should be 0.003-0.012 inches. (See Ex. 2024.)

Ex. 2022, ¶ 17



2367 LAKESIDE DRIVE, SUITE A-1 BIRMINGHAM, AL 35244
PHONE (205) 453-0236 FACSIMILE (205) 453-0239
www.innovativecombustion.com

Optimum Operation and Maintenance of EL Pulverizers

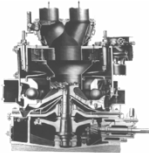


Figure 1- B&W EL Pulverizer

The EL pulverizer is a medium speed ball-and-race mill working on the ball bearing principle. EL pulverizers are manufactured in 18 sizes ranging from EL-17 to EL-76. The numeric specification on EL pulverizers indicates the pitch circle of the balls in inches. EL pulverizers operate at capacities between 1% (EL-17) to 20% (EL-76) tons per hour based on 50 H.G.L. coal. Most electric utility installations utilize the EL-50, EL-64, EL-70 or EL-76. The Babcock and Wilcox EL pulverizers can provide outstanding pulverizer performance when optimum operational and maintenance practices are adhered to. Optimum operation of the EL pulverizer requires the following:

- Coal fineness of 75% passing 200 Mesh and $\leq 0.1\%$ remaining on 50 Mesh. EL pulverizers that utilize ball bearing type grinding achieve very high 50 Mesh fineness much easier than other types of pulverizers.
- A maximum imbalance of $\pm 5\%$ deviation from the mean dry air flow between each pulverizer's separate fuel lines.
- A maximum imbalance $\pm 10\%$ deviation from the mean fuel flow between each pulverizer's separate fuel lines.
- Pipe to pipe clean air balance within $\pm 2\%$ of the mean pipe velocity.
- Air to fuel ratio of 1.75 to 1.8 pounds of air per pound of fuel.
- Pulverizer to pulverizer mass air and fuel balance within $\pm 5\%$.
- Pulverizer outlet temperature of 160°F or higher.
- Minimum fuel line velocity of 3,300 Fpm.

Operation within these parameters is critical to the following items:

- Ensuring stable burner flames
 - Prevention of fuel line stoppages, pulsation or slugging.
 - Ensuring full design pulverizer capacity is achieved.
 - Obtaining acceptable levels on unburned Carbon in Flyash.
 - Uniform release and absorption of heat across of the furnace.
 - Reduction in furnace slagging and fouling propensities.
 - Maintaining furnace and boiler exit gas temperatures within design tolerances.
 - Prevention of water-wall wastage and tube metal overheating.
 - Maintaining design or better unit heat rate
- Numerous variables influence distribution of air and fuel between a pulverizer's separate fuel lines. These variables are as follows:
- Size of pulverizer coal particles leaving the pulverizer (Fineness).
 - System resistance of each individual fuel conduit.
 - Total airflow through the pulverizer which is controlled on a ratio of weight of air to fuel.
 - Velocity of air/coal mixture passing through each burner line.
 - Maintenance of critical components such as the classifier, classifier cone, grinding rings, balls, cabbage cutter, orifices and burner components.

Coal Fineness and Fuel Balance
Utilization of Pre-NSPS burners required 70% passing 200 Mesh and $\leq 1\%$ remaining on 50 Mesh. Many operators today are forced to utilize Low NOx burners. Low NOx burners require a higher degree of precision in delivery of fuel and air to the furnace. To compensate for fuel and air imbalances and lower exposure time of fuel carbon to free Oxygen at temperatures above ignition points, coal fineness standards required reevaluation. Low NOx burner firing configurations require $\geq 75\%$ passing 200 Mesh

Sandvik EX2024 Page 1
CMS Cepcor v. Sandvik IPR2024-01381
Page 1 of 5

Rev. 2/10

Raw Coal Size

Maintaining optimum sizing of raw coal to the pulverizer is mandatory in achieving capacity and fineness. Optimum raw coal feed size for EL pulverizers is $\frac{3}{4}$ " to 1". Raw coal feed should never exceed $1\frac{1}{4}$ ", raw coal this size can plug throats and cause vibration. Raw coal that is too fine can plug the pulverizer or delivery components upstream of the pulverizer. Regular yard crusher inspection and maintenance is required to maintain optimum raw coal sizing.

Ex. 2024, 2

“Ideal”



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Optimum Operation and Maintenance of EL Pulverizers

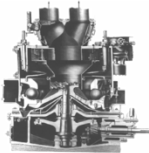


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Sandvik EX2024 Page 1
CMS Cepcor v. Sandvik IPR2024-01381
Page 1 of 5

Rev. 2/10

- Coal fineness of 75% passing 200 Mesh and $\leq 0.1\%$ remaining on 50 Mesh. EL pulverizers that utilize ball bearing type grinding achieve very high 50 Mesh fineness much easier than other types of pulverizers.

Ex. 2024, 1

FRE 602

FEDERAL RULES
OF
EVIDENCE

DECEMBER 1, 2024



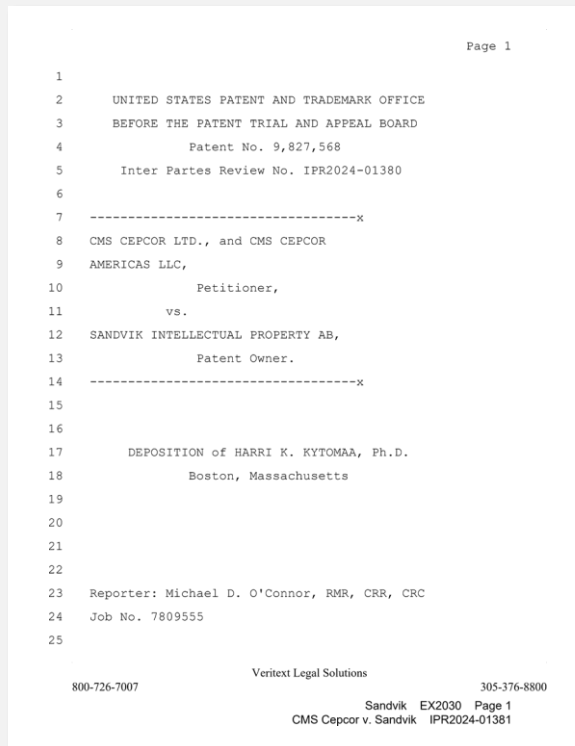
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Rule 602. Need for Personal Knowledge

A witness may testify to a matter only if evidence is introduced sufficient to support a finding that the witness has personal knowledge of the matter. Evidence to prove personal knowledge may consist of the witness's own testimony. **This rule does not apply to a witness's expert testimony under Rule 703.**

(As amended Mar. 2, 1987, eff. Oct. 1, 1987; Apr. 25, 1988, eff. Nov. 1, 1988; Apr. 26, 2011, eff. Dec. 1, 2011.)

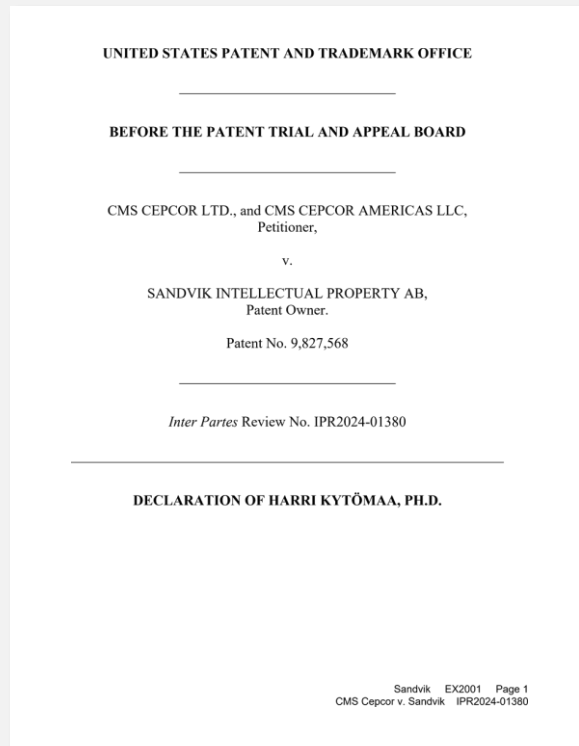
Dr. Kytömaa's Personal Knowledge



- Q. Prior to being involved with this case, did you have any experience working with or opining on coal pulverizers?
- A. Yes.
- Q. Could you elaborate on your experience?
- A. Yeah. My involvement with coal pulverizers is really in the context of coal-fired power plants. The most recent project that I've worked of that kind was in Brazil, where there were issues associated with the pulverizer, but generally there were issues with the power plant. That was just one of the issues.

Ex. 2030, 8:23–9:11

Dr. Kytömaa's Personal Knowledge



oscillatory stresses. I have also worked on coal handling equipment such as ball mills and crushers associated with coal mining and coal fired power plants.

17. Indeed, while Mr. Smith has testified that he does not have two years of experience with rock crushers (Ex. 2011, 39:8–10), I do have experience with rock crushers and I have published in the field of comminution. (Ex. 2002, 3–14.)

Ex. 2007, ¶¶ 16–17

FRE 703

FEDERAL RULES
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Rule 703. Bases of an Expert's Opinion Testimony

An expert may base an opinion on facts or data in the case that the expert has been made aware of or personally observed. If experts in the particular field would reasonably rely on those kinds of facts or data in forming an opinion on the subject, they need not be admissible for the opinion to be admitted. But if the facts or data would otherwise be inadmissible, the proponent of the opinion may disclose them to the jury only if their probative value in helping the jury evaluate the opinion substantially outweighs their prejudicial effect.

(As amended Mar. 2, 1987, eff. Oct. 1, 1987; Apr. 17, 2000, eff. Dec. 1, 2000; Apr. 26, 2011, eff. Dec. 1, 2011.)

Piepho: B&W Type E and EL Pulverizer

1

STRAIN RELIEF MAIN SHAFT ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to an improved main shaft for a coal pulverizer, and more particularly to an improved main shaft for use in B&W Type E and EL pulverizers

2. Description of the Related Art

Coal pulverizers are widely used in the electric utility industry for the preparation of crushed coal for efficient combustion. A dominant type of pulverizer for this service is the vertical spindle type. For many years this type featured an integral speed reducer. The output shaft for the speed reducer has a closely fitted mechanical joint with the grinding table and this joint is subjected to severe stresses from driving forces and from impact, shock, and eccentric loading from the grinding process.

FIG. 1 shows a cross section of a B&W type EL pulverizer generally depicted as numeral 2. These devices are used to crush coal for burning in a furnace or boiler. This type of pulverizer has a stationary top ring 4, one rotating bottom

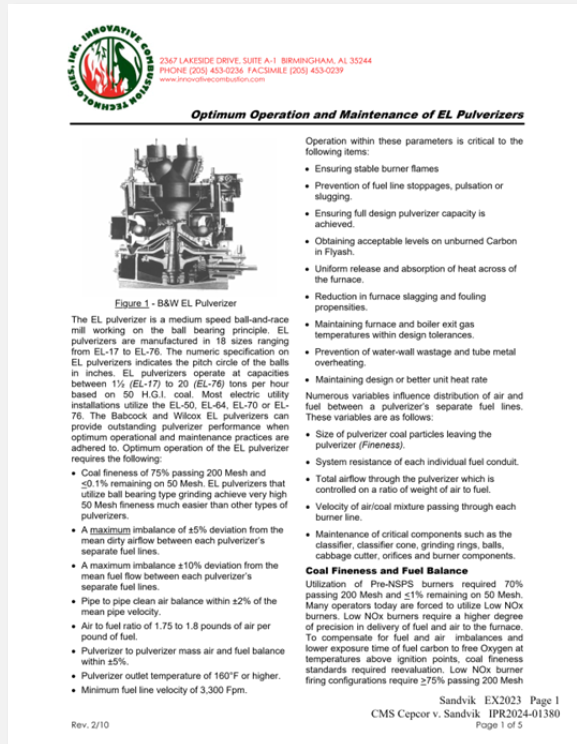
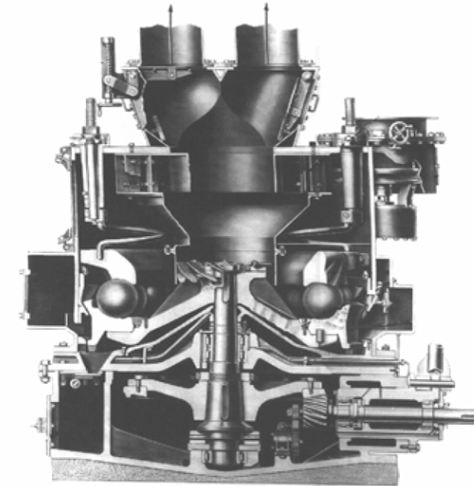
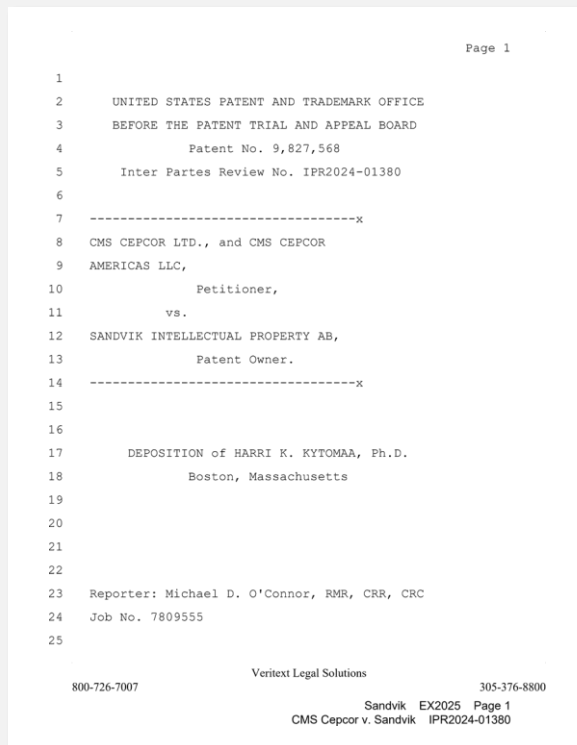


Figure 1 - B&W EL Pulverizer

The EL pulverizer is a medium speed ball-and-race mill working on the ball bearing principle. EL pulverizers are manufactured in 18 sizes ranging from EL-17 to EL-76. The numeric specification on EL pulverizers indicates the pitch circle of the balls in inches. EL pulverizers operate at capacities between $1\frac{1}{2}$ (EL-17) to 20 (EL-76) tons per hour based on 50 H.G.I. coal. Most electric utility installations utilize the EL-50, EL-64, EL-70 or EL-76. The Babcock and Wilcox EL pulverizers can provide outstanding pulverizer performance when optimum operational and maintenance practices are adhered to. Optimum operation of the EL pulverizer requires the following:

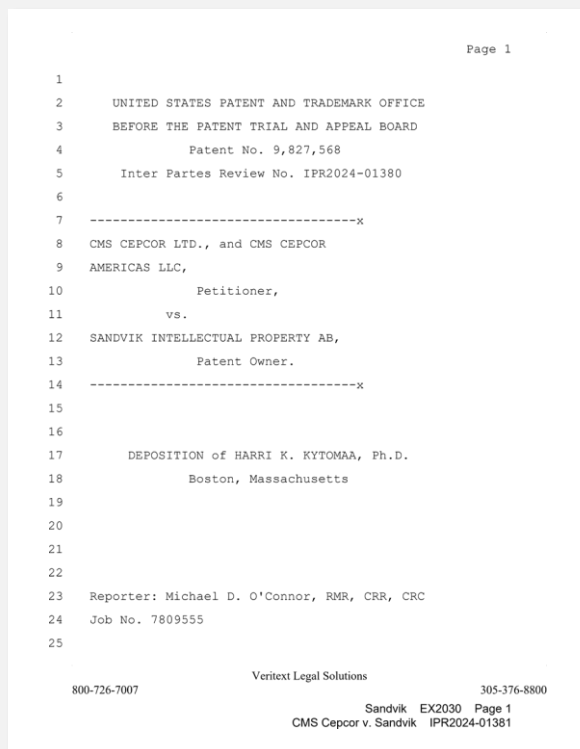
Dr. Kytömaa on Piepho and Ex. 2024



- Q.** What I've handed you is Exhibit 1018, which is the Piepho reference that we've talked about before. In this reference, does it teach the intended input size of coal?
- A.** So this is the Piepho -- Piepho -- I'll call it Piepho if that's okay with you.
- Q.** That's fine.
- A.** I'm not quite sure what the correct pronunciation is. '026 patent assigned to the Babcock & Wilcox Company. So this invention is in the context of Babcock & Wilcox pulverizers, specifically Type E and Type EL pulverizers.

Ex. 2030, 9:12-25

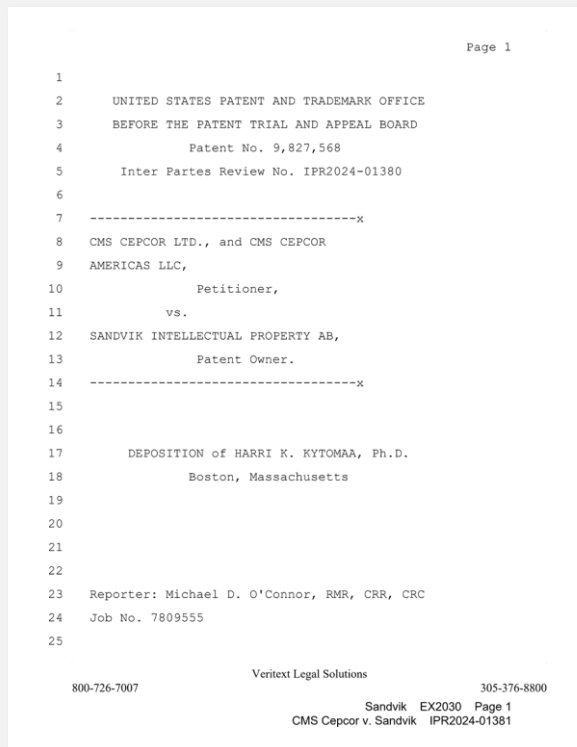
Dr. Kytömaa on Piepho and Ex. 2024



- A.** ... I've specifically looked into the specifications associated with these pulverizers, and the answer to your question is, yes, there is a specific size range that is relevant to these types of pulverizers.
- Q.** Just so I'm clear, there's the specific size relevant to the B&W Type EL pulverizer?
- A.** That's correct. And I cite to that in my declaration.

Ex. 2030, 10:1-10

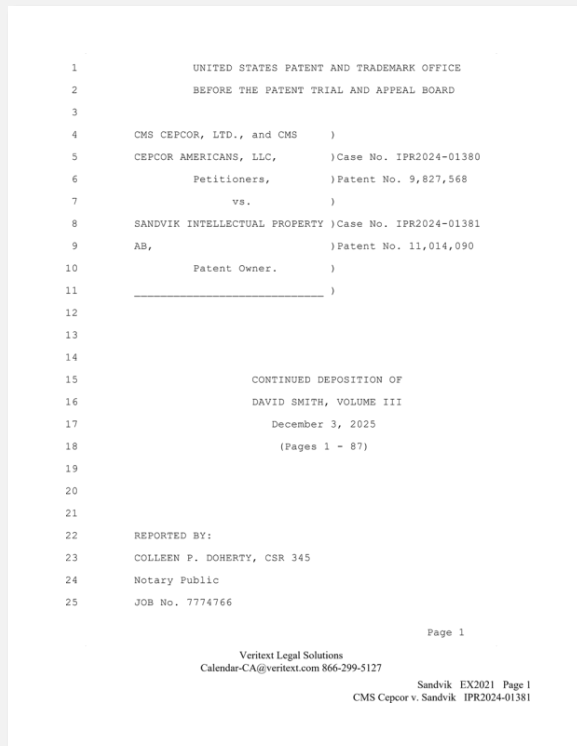
Dr. Kytömaa on Piepho and Ex. 2024



- Q.** ... If I read from it, the question would have sounded better.
- A.** So the field of invention of Piepho relates to an improved main shaft for a coal pulverizer, and more particularly, to an improved main shaft for use in the Babcock & Wilcox Type E and EL pulverizers. So it's very specific to what this invention is intended for. And so, that defines, that is Babcock & Wilcox Type E and EL, defines the intended use of the product, and it is a coal pulverizer. If I may supplement the question. The claims of the patent are also very specific to pulverizing coal.

Ex. 2030, 11:1-15

Mr. Smith: Website and Videos



Q. What do you recall reviewing Mr. Smith?

A. I remember going to the website, and looking at different pulverizers that they have, and locating -- trying to locate the one referenced here. And I believe there were some videos, or the like, on that. But it's been several months.

Q. So were you looking at coal pulverizers that were made by the assignee of the Piepho patent, the Babcock & Wilcox Company?

A. I believe so.

Ex. 2021, 74:2-11

Mr. Smith: Website and Videos

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3
4 CMS CEPACOR, LTD., and CMS)
5 CEPACOR AMERICANS, LLC,) Case No. IPR2024-01380
6 Petitioners,) Patent No. 9,827,568
7 vs.)
8 SANDVIK INTELLECTUAL PROPERTY) Case No. IPR2024-01381
9 AB,) Patent No. 11,014,090
10 Patent Owner.)
11 _____)
12
13
14
15 DEPOSITION OF DAVID SMITH
16 June 11, 2025
17
18
19
20 REPORTED BY:
21 COLLEEN P. DOHERTY, CSR 345
22 Notary Public
23 JOB No. 7405355
24
25 PAGES 1 - 98

Page 1

Veritext Legal Solutions
Calendar-CA@veritext.com 866-299-5127

- Q.** Would it be possible for you to explain to me how the coal pulverizer operates? Maybe as it's explained on Piepho, if that's easier for you?
- A.** So the Piepho reference to my recollection doesn't specifically describe the inner workings of the coal pulverizer. It does talk about cyclic motion, but maybe focuses on the main shaft. So I recall going and looking at the website for BMW coal crushers, but I don't recall specifically at this point how it works.

Ex. 2011, 57:24-58:7



Q

=

← Back to Stationary cone crushers

CH440Request a quote



Stationary cone crushers 400-600 series

CH440

Nominal capacity58 - 336 mtph (64 - 370 stph)

Max. feed size250.0 mm (9.8 in.)

Motor power220 kW (295 hp)

Product data	
Nominal capacity	58 - 336 mtph (64 - 370 stph)
Max. feed size	250.0 mm (9.8 in.)
Motor power	220 kW (295 hp)
Closed side setting (CSS) range	8.0 - 48.0 mm (0.3 - 1.8 in.)
Eccentric throw range	16.0 - 44.0 mm (0.6 - 1.7 in.)

Ex. 2025, 1-2

Authentication

“Authentication is a low bar, requiring only a rational basis that the exhibits are what they are asserted to be.”

Costar Reality Info., Inc. v. Clantech, Inc., IPR2022-00799, Paper 77 at 54 (P.T.A.B Nov. 21, 2023)
(citation omitted)

FRE 901(b)(4)

Rule 901. Authenticating or Identifying Evidence

(a) IN GENERAL. To satisfy the requirement of authenticating or identifying an item of evidence, the proponent must produce evidence sufficient to support a finding that the item is what the proponent claims it is.

(b) EXAMPLES. The following are examples only—not a complete list—of evidence that satisfies the requirement:

(1) *Testimony of a Witness with Knowledge.* Testimony that an item is what it is claimed to be.

(2) *Nonexpert Opinion About Handwriting.* A nonexpert's opinion that handwriting is genuine, based on a familiarity with it that was not acquired for the current litigation.

(3) *Comparison by an Expert Witness or the Trier of Fact.* A comparison with an authenticated specimen by an expert witness or the trier of fact.

(4) *Distinctive Characteristics and the Like.* The appearance, contents, substance, internal patterns, or other distinctive characteristics of the item, taken together with all the circumstances.

FRE 902(7)

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Rule 902. Evidence That Is Self-Authenticating

The following items of evidence are self-authenticating; they require no extrinsic evidence of authenticity in order to be admitted:

(7) *Trade Inscriptions and the Like.* An inscription, sign, tag, or label purporting to have been affixed in the course of business and indicating origin, ownership, or control.

18. Ex. 2024 is a technical specification published by Innovative Combustion Technologies, Inc., which describes features of the Babcock & Wilcox Company coal pulverizer of a type EL. I understand that Piepho is assigned to Babcock & Wilcox Company, and Piepho also references a type EL coal pulverizer. I note that Ex. 2024 has what appears to be a date at the bottom left of 2/10, that is, February 2010. In my experience, such technical specifications are usually dated in this manner, and I have no reason to believe that this was not published in February 2010.

Ex. 2022, ¶ 18

Affidavit of Mina Ching



AFFIDAVIT OF MINA CHING

1. I am a Records Request Processor at the Internet Archive. I make this declaration of my own personal knowledge.
2. The Internet Archive is a website that provides access to a digital library of Internet sites and other cultural artifacts in digital form. Like a paper library, we provide free access to researchers, historians, scholars, and the general public. The Internet Archive has partnered with and receives support from various institutions, including the Library of Congress.
3. The Internet Archive has created a service known as the Wayback Machine. The Wayback Machine makes it possible to browse more than 450 billion pages stored in the Internet Archive's web archive. Visitors to the Wayback Machine can search archives by URL (i.e., a website address). If archived records for a URL are available, the visitor will be presented with a display of available dates. The visitor may select one of those dates, and begin browsing an archived version of the Web. Links on archived files in the Wayback Machine point to other archived files (whether HTML pages or other file types), if any are found for the URL indicated by a given link. For instance, the Wayback Machine is designed such that when a visitor clicks on a hyperlink on an archived page that points to another URL, the visitor will be served the archived file found for the hyperlink's URL with the closest available date to the initial file containing the hyperlink.
4. The archived data made viewable and browsable by the Wayback Machine is obtained by use of web archiving software that automatically stores copies of files available via the Internet, each file preserved as it existed at a particular point in time.
5. The Internet Archive assigns a URL on its site to the archived files in the format `http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss][Archived URL]` aka an "extended URL". Thus, the extended URL `http://web.archive.org/web/19970126045828/http://www.archive.org/` would be the URL for the record of the Internet Archive home page HTML file (`http://www.archive.org/`) archived on January 26, 1997 at 4:58 a.m. and 28 seconds (1997/01/26 at 04:58:28). The date indicated by an extended URL applies to a preserved instance of a file for a given URL, but not necessarily to any other files linked therein. Thus, in the case of a page constituted by a primary HTML file and other separate files (e.g., files with images, audio, multimedia, design elements, or other embedded content) linked within that primary HTML file, the primary HTML file and the other files will each have their own respective extended URLs and may not have been archived on the same dates.

Document ID: 02CDE205-0386-11F0-47E1-686E5A3C1736
OnlineNotary.net



Page 1/23

Sandvik EX2031 Page 1
CMS Cepcor v. Sandvik IPR2024-01381



6. Attached hereto as Exhibit A are true and accurate copies of browser screenshots of the Internet Archive's records of the archived files for the URLs and the dates specified in the attached coversheet of each screenshot.
7. Attached hereto as Exhibit B are true and accurate copies of the Internet Archive's records of the archived files for the URLs and the dates specified in the attached coversheet of each file.
8. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

DATE: 12/24/2025

My
Mina Ching

Document Notarized using a Live Audio-Video Connection



Please see attached
All Purpose
Just form
for additional
Notary Events

Document ID: 02CDE205-0386-11F0-47E1-686E5A3C1736
OnlineNotary.net



Page 2/23

Sandvik EX2031 Page 2
CMS Cepcor v. Sandvik IPR2024-01381

Affidavit of Mina Ching

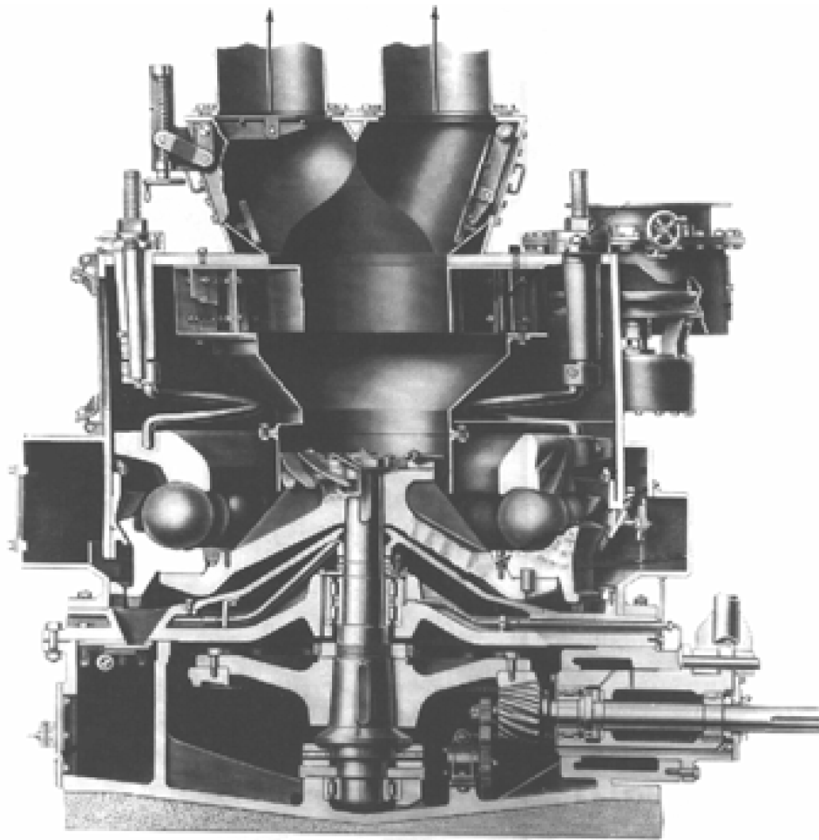
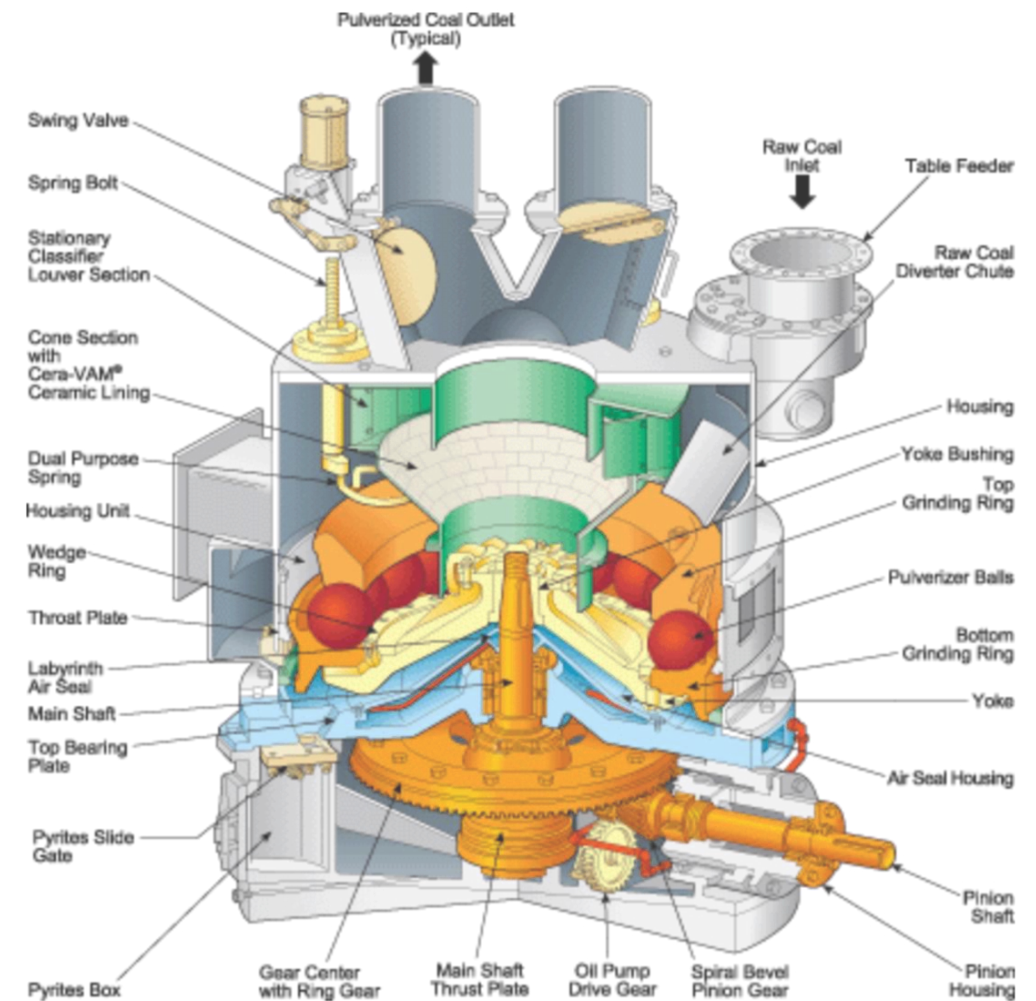


Figure 1 - B&W EL Pulverizer

Ex. 2024, 1



Ex. 2031, 5

Affidavit of Mina Ching

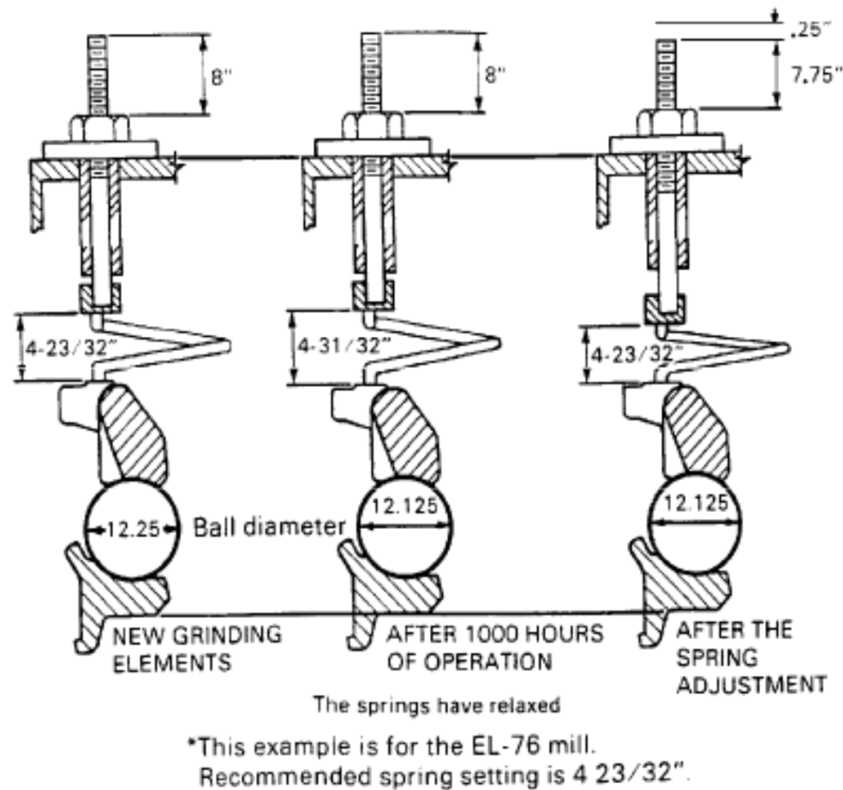


Figure 5 - Spring Adjustment by External Measurement

Ex. 2024, 3, FIG. 5

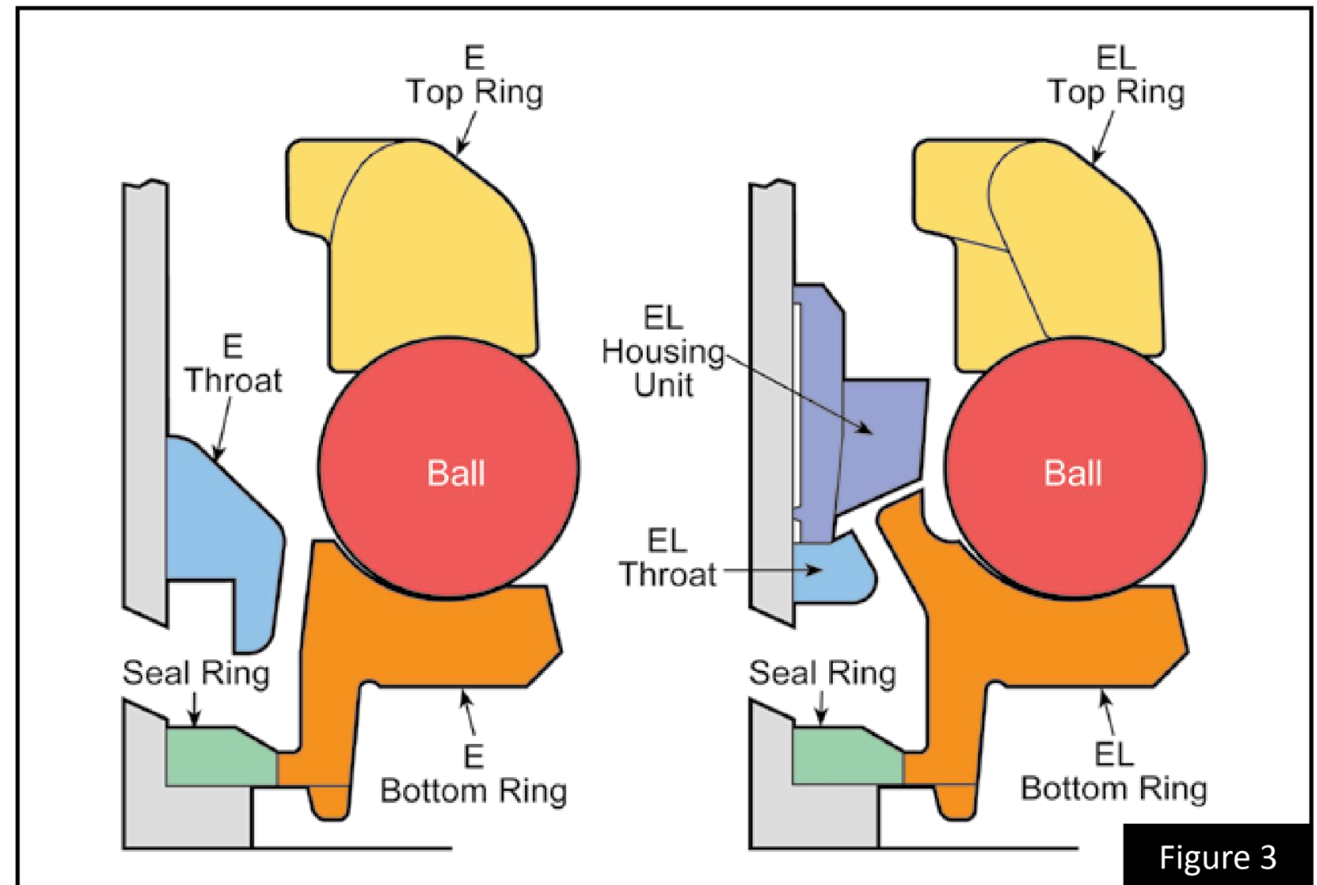


Figure 3

Ex. 2031, 15, FIG. 3

Petitioner on Misquoting

example, Mr. Kytömaa's declaration quotes Mr. Smith in conjunction with the assertion that the '090 patent provides benefits in the form of increased safety and efficiency; however, Mr. Smith's testimony was actually limited to his assessment of the '090 patent's disclosures. (Ex. 2022, ¶ 32); (Ex. 2011, p. 21:9-22:1). There was no discussion of the "benefits," "safety," or "efficiency" of the '090 patent. Similarly, Mr. Kytömaa's declaration claims that "Mr. Smith testified that he did not consider Piepho beyond is disclosure of a tapered shaft," yet Mr. Kytömaa fails to quote the section featuring the testimony. (Ex. 2022, ¶ 37); (Ex. 2011, p. 65:5-16). That is because it is nonexistent. A similar pattern is featured throughout Mr. Kytömaa's declaration through paragraphs 13–35, 37–42, 44–48, 50–54, and 56–58.

Petitioner's MTE (Paper 44), 10-11

Misquoting: Dr. Kytömaa's Statements

B. Reasonably Pertinent To The Problem

32. A POSITA would not view Piepho as reasonably pertinent to the problem solved by the '090 patent. The '090 patent and Piepho are directed to different problems. The '090 patent concerns the problem of assembling and disassembling a wear sleeve from a main shaft of a gyratory crusher. (Ex. 1001, 1:51–2:9; *see also* Ex. 2027 (video showing the benefits provided by aspects of the invention, including increased safety and efficiency); *see also* Ex. 2011, 21:9–22:1 (Mr. Smith stating that the problem addressed by the '090 Patent is “the best ways for seating or assembling of the sleeve over the conical section of the main shaft.”).)

Petitioner on Misquoting

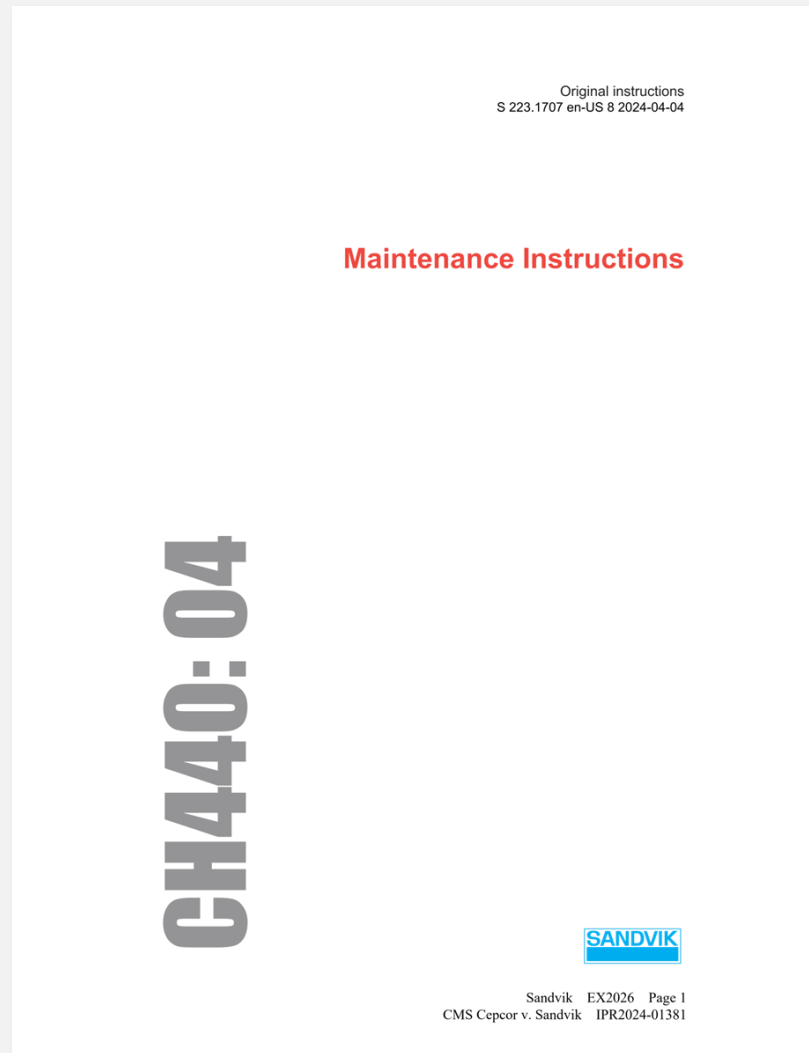
of the '090 patent's disclosures. (Ex. 2022, ¶ 32); (Ex. 2011, p. 21:9-22:1). There was no discussion of the “benefits,” “safety,” or “efficiency” of the '090 patent. Similarly, Mr. Kytömaa's declaration claims that “Mr. Smith testified that he did not consider Piepho beyond is disclosure of a tapered shaft,” yet Mr. Kytömaa fails to quote the section featuring the testimony. (Ex. 2022, ¶ 37); (Ex. 2011, p. 65:5-16). That is because it is nonexistent. A similar pattern is featured throughout Mr. Kytömaa's declaration through paragraphs 13–35, 37–42, 44–48, 50–54, and 56–58.

Petitioner's MTE (Paper 44), 11

Misquoting: Dr. Kytömaa's Statements

37. Mr. Smith has chosen isolated snippets from Piepho and applies them to Coxhill. Mr. Smith testified that he did not consider Piepho beyond its disclosure of a tapered shaft. (Ex. 2021, 65:5–16.) His approach suggests to me that he improperly used the tapered shaft claim language as a blueprint to select Piepho—a non-analogous reference—through hindsight. Only by ignoring Piepho's field and focus—in other words, everything other than Piepho's disclosure of a tapered shaft—could Petitioner and Mr. Smith conclude obviousness. When Piepho is considered for all that it teaches, there would be no motivation to combine Piepho with Coxhill.

Ex. 2026



Ex. 2026

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Ex. 2026, 2

Ex. 2032

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Document number: S 223.1051

Version: 1

Language: en-US

Issue: 06/02/2015

Ex. 2032, 2

Ex. 2026 & Ex. 2032

2.6 Yearly inspection and care

Operation hours - Yearly or after every 2000 hours of operation			
Maintenance procedure			Notes
Perform the maintenance procedures of all relevant shorter intervals at the same time.		☐	See the instructions for reading maintenance cards.
REPLACING THE MAIN SHAFT SLEEVE			
Check the main shaft sleeve for wear		82 ☐	

Ex. 2026, 23

2.4. Yearly inspection and care

Operation hours - Yearly or every 2000 hours of operation			
Maintenance procedure			Notes
MAINSHAFT			
Check the mainshaft sleeve for wear		64 ☐	
ECCENTRIC			
Check the eccentric for wear		90 ☐	
Check the eccentric bushing for wear		97 ☐	

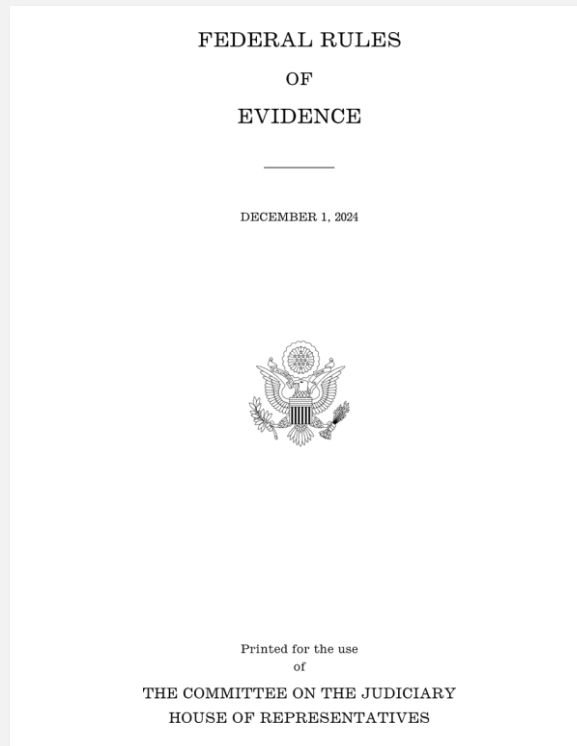
Ex. 2032, 21

Ex. 2027



Ex. 2027

FRE 802



Rule 802

FEDERAL RULES OF EVIDENCE

18

(2) *An Opposing Party's Statement.* The statement is offered against an opposing party and:

(A) was made by the party in an individual or representative capacity;

(B) is one the party manifested that it adopted or believed to be true;

(C) was made by a person whom the party authorized to make a statement on the subject;

(D) was made by the party's agent or employee on a matter within the scope of that relationship and while it existed; or

(E) was made by the party's coconspirator during and in furtherance of the conspiracy.

The statement must be considered but does not by itself establish the declarant's authority under (C); the existence or scope of the relationship under (D); or the existence of the conspiracy or participation in it under (E).

If a party's claim, defense, or potential liability is directly derived from a declarant or the declarant's principal, a statement that would be admissible against the declarant or the principal under this rule is also admissible against the party.

(As amended Pub. L. 94-113, §1, Oct. 16, 1975, 89 Stat. 576, eff. Oct. 31, 1975; Mar. 2, 1987, eff. Oct. 1, 1987; Apr. 11, 1997, eff. Dec. 1, 1997; Apr. 26, 2011, eff. Dec. 1, 2011; Apr. 25, 2014, eff. Dec. 1, 2014; Apr. 2, 2024, eff. Dec. 1, 2024.)

Mr. Smith: Knowledge of a POSITA

Q. So were you looking at coal pulverizers that were made by the assignee of the Piepho patent, the Babcock & Wilcox Company?

A. I believe so.

Q. And did you provide, in your earlier reports, what you found with regard to your search of the prior art that's mentioned in Piepho?

A. I would have to go back and look. I don't recall.

Q. So is it your understanding, that the prior art that's mentioned in Piepho is available to a person of ordinary skill in the art?

A. I would imagine that there is at least some information on it.

Mr. Smith: Knowledge of a POSITA

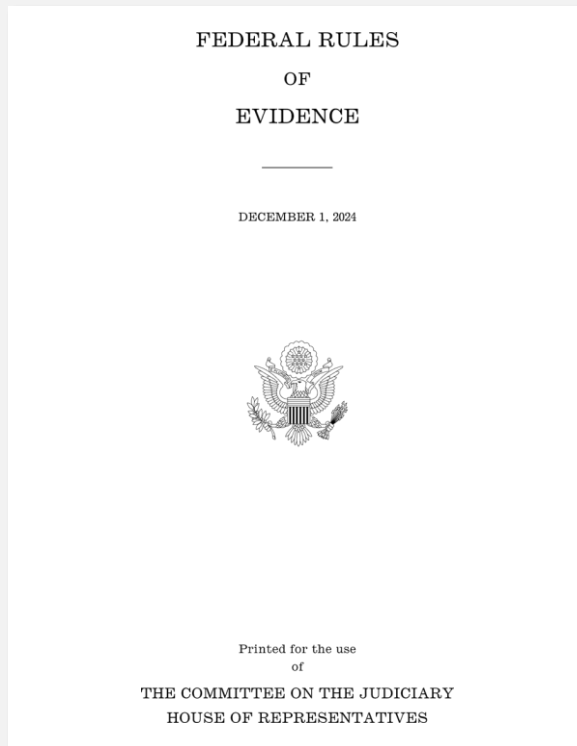
Case CBM2012-00010

Patent 7,124,088 B2

Klausner to be admissible. We further agree with Liberty that the articles that are Exhibits 1025-1034 and 1036 serve a non-hearsay purpose for which they can be admitted—namely to show what one with ordinary skill in the art would have known about technical features and developments in the pertinent art. *Id.* at 11.

Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co.,
CBM2012-00010, Paper 59 at 37 (P.T.A.B. Feb. 24, 2014)

FRE 802



Rule 802

FEDERAL RULES OF EVIDENCE

18

(2) *An Opposing Party's Statement.* The statement is offered against an opposing party and:

(A) was made by the party in an individual or representative capacity;

(B) is one the party manifested that it adopted or believed to be true;

(C) was made by a person whom the party authorized to make a statement on the subject;

(D) was made by the party's agent or employee on a matter within the scope of that relationship and while it existed; or

(E) was made by the party's coconspirator during and in furtherance of the conspiracy.

The statement must be considered but does not by itself establish the declarant's authority under (C); the existence or scope of the relationship under (D); or the existence of the conspiracy or participation in it under (E).

If a party's claim, defense, or potential liability is directly derived from a declarant or the declarant's principal, a statement that would be admissible against the declarant or the principal under this rule is also admissible against the party.

(As amended Pub. L. 94-113, §1, Oct. 16, 1975, 89 Stat. 576, eff. Oct. 31, 1975; Mar. 2, 1987, eff. Oct. 1, 1987; Apr. 11, 1997, eff. Dec. 1, 1997; Apr. 26, 2011, eff. Dec. 1, 2011; Apr. 25, 2014, eff. Dec. 1, 2014; Apr. 2, 2024, eff. Dec. 1, 2024.)

FRE 803(17)

FEDERAL RULES
OF
EVIDENCE

DECEMBER 1, 2024



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Rule 803. Exceptions to the Rule Against Hearsay—Regardless of Whether the Declarant Is Available as a Witness

The following are not excluded by the rule against hearsay, regardless of whether the declarant is available as a witness:

(17) *Market Reports and Similar Commercial Publications.* Market quotations, lists, directories, or other compilations that are generally relied on by the public or by persons in particular occupations.

FRE 807

FEDERAL RULES
OF
EVIDENCE

DECEMBER 1, 2024



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Rule 807. Residual Exception

(a) IN GENERAL. Under the following conditions, a hearsay statement is not excluded by the rule against hearsay even if the statement is not admissible under a hearsay exception in Rule 803 or 804:

- (1) the statement is supported by sufficient guarantees of trustworthiness—after considering the totality of circumstances under which it was made and evidence, if any, corroborating the statement; and
- (2) it is more probative on the point for which it is offered than any other evidence that the proponent can obtain through reasonable efforts.

(b) NOTICE. The statement is admissible only if the proponent gives an adverse party reasonable notice of the intent to offer the statement—including its substance and the declarant’s name—so that the party has a fair opportunity to meet it. The notice must be provided in writing before the trial or hearing—or in any form during the trial or hearing if the court, for good cause, excuses a lack of earlier notice.

(As added Apr. 11, 1997, eff. Dec. 1, 1997; amended Apr. 26, 2011, eff. Dec. 1, 2011; Apr. 25, 2019, eff. Dec. 1, 2019.)

IPR2024-01381

Patent No. 11,014,090

Certificate of Service (37 C.F.R. § 42.6(e)(4))

I hereby certify that the attached PATENT OWNER'S DEMONSTRATIVES
was served on the below date via email (by consent) to the following counsel of
record for Petitioner:

Terry M. Sanks
tsanks@firstiniplaw.com
litigation@firstiniplaw.com

Dated: January 9, 2026

/Mehran Arjomand/
Mehran Arjomand