

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BANDIT INDUSTRIES, INC. and SMORACY, LLC,
Petitioner,

v.

ST. MARTIN INVESTMENTS, INC.,
Patent Owner.

Case IPR2017-01849
Patent 6,207,228 B1

Before ERICA A. FRANKLIN, KRISTINA M. KALAN, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a)

I. INTRODUCTION

Bandit Industries, Inc., and Smoracy, LLC (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1, 2, 7, and 16 of U.S. Patent No. 6,207,228 B1 (“the ’228 patent,” Ex. 1001). Paper 1 (“Pet.”). St. Martin Investments, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). We instituted an *inter partes* review of claims 1, 2, 7, and 16 on certain grounds of unpatentability alleged in the Petition. Paper 8 (“Institution Decision” or “Dec.”). After the Supreme Court’s decision in *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018), we issued an Order (Paper 10) modifying the Institution Decision to include all of the challenged claims on all grounds identified in the Petition. After institution of trial on all of the challenged claims and grounds, Patent Owner filed a Patent Owner Response. Paper 11 (“PO Resp.”). Petitioner filed a Reply. Paper 12 (“Reply”). An oral hearing was held on October 25, 2018. A transcript of the hearing is included in the record. Paper 16 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has not established by a preponderance of the evidence that claims 1, 2, 7, and 16 of the ’228 patent are unpatentable.

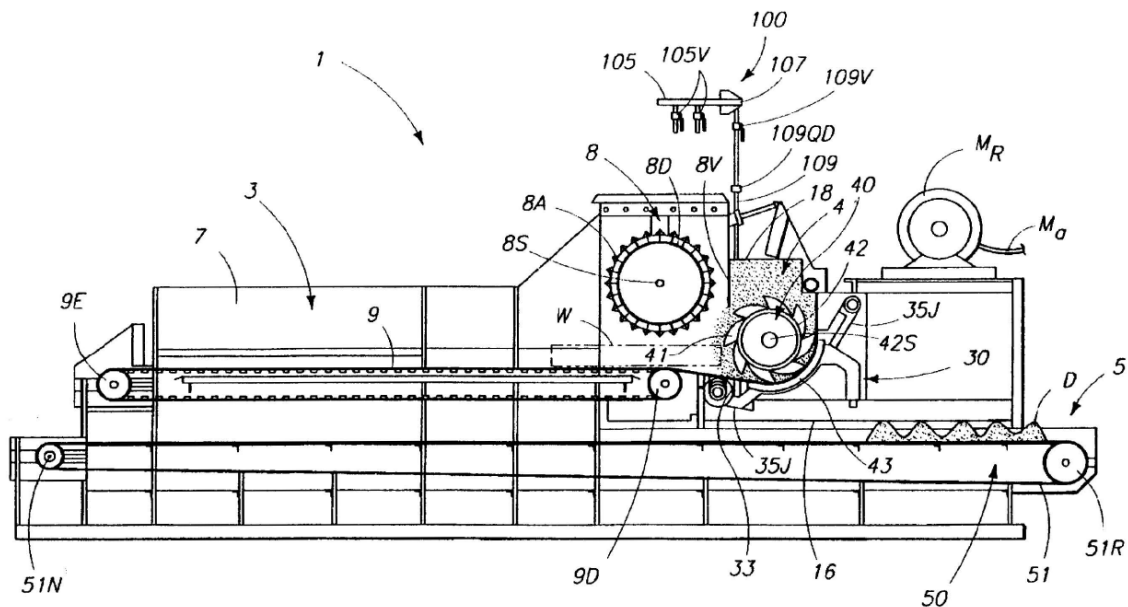
A. *Related Proceedings*

The parties represent that Patent Owner filed suit against Petitioner for infringement of the ’228 patent in *St. Martin Inv., Inc. v. Bandit Indus., Inc.*, Case No. 1:17-cv-00472-PLM-PJG (W.D. Mich.). Pet. 2; Paper 5, 1.

B. The '228 Patent

The '228 patent, titled “Concurrent Fragmentation and Impregnation Machine and Processing,” issued on March 27, 2001. Ex. 1001, at [45], [54]. The '228 patent relates to an impregnating process “for use in impregnating cellulosic materials with multiple impregnating agents or colorants furnished to a fragmenting zone from multiple sources at controlled and monitored rates.” *Id.* at [57]. The claimed invention “relates to uniformly dispersing an additive within particulated materials, and more particularly to incorporating additives into recycled materials while suspending the materials in a particulating zone and apparatuses for the processing thereof.” *Id.* at 1:10–15.

Figure 2 of the '228 patent, reproduced below, depicts an apparatus for processing the referenced materials:



As shown in Figure 2, impregnating machine 1 includes feeding means generally designated as 3, in the form of hopper 7 and continuous apron 9 or conveying belt for feeding wastes to waste fragmenting zone 4. *Id.* at 4:33–39. Power feeder 8 positions and aligns waste W for effective fragmentation by fragmenting rotor 40. *Id.* at 4:45–50. The specification describes a cooperative operational relationship between apron 9, power feeder 8, striking bar 33, impacting teeth 41 of rotor 42, and impregnating accessory 100. *Id.* at 5:19–24. Impregnating accessory 100 includes mounted manifold 107 and impregnating feed lines 109. *Id.* at 5:24–30. Striking bar 33 serves as a supportive anvil for shearing waste material fed to fragmenting zone 4, where teeth 41 are staggered upon rotor 42. *Id.* at 5:45–51. Material fragmented by impacting teeth 41 is then radially propelled along the curvature of screen 43, which serves to further fragment by grating waste materials W upon the surface and screen of 43, “until ultimately fragmented to a sufficient particle size so as to screen through screen 43 for collection and discharge by discharging conveyor 51.” *Id.* at 5:54–66. The impregnating agents are continuously introduced to the top of fragmenting zone 4 by impregnating accessory 100 throughout the turbulent flow and impacting of wastes, so as to gravitate onto the suspended fragmenting waste, which “effectively uniformly distributes and impregnates within the fragmented impregnated product D.” *Id.* at 6:2–9. Discharging means 5, such as discharging conveyor belt 51, flighted augers, or pneumatic conveyors, may be used to discharge and collect product D from fragmenting zone 4. *Id.* at 6:53–56.

C. Illustrative Claim

Claim 1 and 16 are the two independent claims challenged in the Petition. Claims 2 and 7 depend directly from claim 1. Claims 1 and 16 are reproduced below:

1. A method for impregnating waste materials with an impregnating agent while concurrently impregnating, suspending, and fragmenting the waste materials in a turbulent fragmenting zone, said method comprising:
 - a) feeding a waste feed of the waste materials to the turbulent fragmenting zone;
 - b) uniformly injecting the impregnating agent onto the waste materials while suspending the waste materials within the fragmenting zone;
 - c) particulating the waste feed to a particulated product by fragmenting and impacting the waste materials within said turbulent fragmenting zone;
 - d) uniformly impregnating the particulated product with said impregnating agent within said turbulent fragmenting zone so as to provide a uniformly impregnated particulated product;
 - e) screening the impregnated particulated product to further fragment said product to a desired particle size; and
 - f) recovering the uniformly impregnated particulated product of the desired particle size from said fragmenting zone.

Ex. 1001, 15:8–30.

16. A waste fragmenting and impregnating machine equipped to concurrently uniformly impregnate and fragment a waste material with an impregnating agent within a turbulent fragmenting zone, said machine comprising:
 - a) feeding means for feeding the waste materials to the machine;
 - b) an enclosed turbulent fragmenting zone for fragmenting the waste materials to a particulated product;
 - c) injection means for injecting and uniformly distributing the impregnating agent within the fragmenting zone while

- turbulently fragmenting and impregnating the particulated product within the turbulent fragmenting zone;
- d) a screen for grating and screening the particulated product to a predetermined particle size; and
- e) recovering means for recovering the particulated impregnated product of the predetermined size from said turbulent fragmenting zone.

Id. at 16:24–42.

D. Instituted Grounds of Unpatentability

We instituted *inter partes* review of the '228 patent on the following grounds (Dec. 29–30; Paper 10, 2):

Reference(s)	Statutory Basis	Claim(s) Challenged
Tertyshnikov ¹	§ 102(b)	1, 2, 7, and 16
Reiniger '635 ²	§ 102(b)	1, 2, 7, and 16
Reiniger '999 ³	§ 102(b)	1, 2, 7, and 16
Reiniger '999 and Sawka ⁴ or Rony ⁵	§ 103	2
Tertyshnikov and Sawka or Rony	§ 103	2

Petitioner relies on the Declaration of Daniel J. Shapiro. Ex. 1009.
Patent Owner relies on the Declaration of Dr. Sridharan Ramaswamy.
Paper 7.

¹ U.S. Patent No. 3,254,687, issued June 7, 1966 (“Tertyshnikov”) (Ex. 1003).

² U.S. Patent No. 4,440,635, issued April 3, 1984 (“Reiniger '635”) (Ex. 1007).

³ U.S. Patent No. 4,245,999, issued January 20, 1981 (“Reiniger '999”) (Ex. 1004).

⁴ U.S. Patent No. 5,358,738, issued October 25, 1994 (“Sawka”) (Ex. 1005).

⁵ U.S. Patent No. 5,308,653, issued May 3, 1994 (“Rony”) (Ex. 1006).

II. ANALYSIS

A. Claim Construction

The Board interprets claims in an unexpired patent using the “broadest reasonable construction in light of the specification of the patent.” 37 C.F.R. § 42.100(b). Under that standard, claim terms are given their ordinary and customary meaning in view of the specification, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).⁶ Any special definitions for claim terms must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Only those terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner states that “claim terms are presumed to take on their ordinary and customary meaning,” and then sets forth constructions of “waste materials,” “impregnating agent,” “coloring agent,” “feeding means,” “injection means,” and “recovering means.” Pet. 7–9.

⁶ The revised claim construction standard for interpreting claims in *inter partes* review proceedings as set forth in the final rule published October 11, 2018, does not apply to this proceeding, because the new “rule is effective on November 13, 2018 and applies to all IPR, PGR and CBM petitions filed on or after the effective date.” Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42).

Patent Owner states that the Board “has not considered multiple vitally important claim terms” and “without examining the terms below it is impossible to meaningfully analyze the ’228 patent and the prior art.” PO Resp. 10. However, Patent Owner does not appear to propose express constructions for any claim term in its Response. In its Response, Patent Owner largely repeats the general discussion of these same claim terms that it presented in its Preliminary Response. *Compare* Prelim. Resp. 6–8 with PO Resp. 11–12. In our Institution Decision, we stated that Patent Owner’s Preliminary Response “provides no reasoning in support of its objections, nor any of its own claim constructions of those terms” discussed in its Preliminary Response. Dec. 8. “Instead, without clearly proposing any express construction for any claim term, Patent Owner generally discusses the meanings of certain other claim terms—‘in a turbulent fragmenting zone’ or ‘within a turbulent fragmenting zone,’ ‘screen,’ ‘uniformly impregnate,’ ‘particulating’ or ‘particulated,’ and ‘fragmenting’ or ‘fragment.’” *Id.* (citing Prelim. Resp. 6–8). Petitioner disputes Patent Owner’s discussion of these claim terms in its Reply, noting that Patent Owner “provides no new arguments for any claim term in its Response, except as regards to ‘waste materials.’” Reply 3–4. Thus, even on the complete record now before us, and in view of Patent Owner’s repeated general discussion of the claim terms, we do not construe these terms. We refrain both because Patent Owner has not provided sufficiently clear proposals for construction of these claim terms despite our Institution Decision guidance, and also because these terms are not in controversy such that they need to be construed. *See Vivid Techs.*, 200 F.3d at 803. This does not mean, however, that we have not “considered multiple vitally important

claim terms” or “examined” the terms in order to “meaningfully analyze the ’228 patent and the prior art” (PO Resp. 10); we consider and examine the terms as necessary in our analysis of the patent and prior art, below.

In our Institution Decision, construed “waste materials,” as “including plastics, cellulosic materials, glassware, waste foods and feeds, metals, agricultural[,] construction and industrial wastes,” as it is consistent with the written description of then co-pending application 08/908,470, which is incorporated by reference into the ’228 patent. Dec. 8 (citing Pet. 8; Ex. 1001, cols. 3–4 (discussing waste processing machines and incorporating by reference then co-pending application 08/908,470, now U.S. Patent No. 5,975,443); Ex. 1008, 1:20–23 (U.S. Patent No. 5,975,443, describing waste materials)). Patent Owner argues that “waste materials” should be construed to mean “particulated paper, wood chips, fibers, or any cellulosic product,” based on the ’228 patent specification’s disclosure of impregnating “particulated paper, wood chips, or fibers.” PO Resp. 12 (citing Ex. 1001, 12:40–41); *see also* Tr. 20:16–17 (“Our construction of waste materials are paper, woodchips and fibers.”). We are not persuaded by Patent Owner that we should import limitations from the specification in this manner. While the specification should be used to interpret the meaning of a claim, “courts must not ‘import[] limitations from the specification into the claim.’” *In re Trans Texas Holdings Corp.*, 498 F.3d 1290, 1299 (Fed. Cir. 2007) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc)). It is only when the patentee has demonstrated a clear intention to limit the claim scope using “words or expressions of manifest exclusion or restriction” that the scope of a claim is properly restricted to that of a disclosed embodiment.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d

898, 906 (Fed. Cir. 2004). Patent Owner does not appear to have done so. Thus, we maintain our claim construction of “waste materials,” namely, “including plastics, cellulosic materials, glassware, waste foods and feeds, metals, agricultural[,] construction and industrial wastes.”

In our Institution Decision, we adopted Petitioner’s proposed constructions of the means-plus-function terms, as follows:

Claim Term	Function	Structure
feeding means	feeding the waste materials to the machine Pet. 8; Ex. 1001, 16:28–29 (claim 16)	assembly 3, which includes at least hopper 7 and conveyor belt 9, and optionally power feeder 8 Pet 8–9 (citing Ex. 1001, 4:35–39, 4:45–5:7)
injection means	injecting and uniformly distributing the impregnating agent within the fragmenting zone while turbulently fragmenting and impregnating the particulated product within the turbulent fragmenting zone Pet. 9; Ex. 1001, 16:32–36 (claim 16)	manifold 107 and feed lines 109 Pet. 9 (citing Ex. 1001, 5:24–27, 10:26–31)
recovering means	recovering the particulated impregnated product of the predetermined size from said turbulent fragmenting zone Pet. 9; Ex. 1001, 16:40–42 (claim 16)	belt-type conveyor 50 or a flighted auger or pneumatic conveyor Pet. 9 (citing Ex. 1001, 6:43–56)

Dec. 9. Patent Owner does not contest these constructions, and on the complete record now before us, we maintain these undisputed constructions for the purposes of this Final Written Decision. On the complete record now

before us, we determine that no other claim term requires express construction for purposes of this decision.

B. Person of Ordinary Skill in the Art

We consider each ground of unpatentability in view of the understanding of a person of ordinary skill in the art. Petitioner asserts that one of ordinary skill in the art is “someone with a bachelor’s degree in mechanical engineering (or equivalent educational experience) and who also engaged in maintenance activities of material processing or similar equipment” or alternatively “someone with at least a high school education and at least 5 years of experience in the field of waste material processing, including material recycling.” Pet. 10 (citing Ex. 1009 ¶¶ 23–24). Patent Owner argues that a person of ordinary skill in the art “should have at least a mechanical engineering degree and have at least 5 years of experience in wood or paper products recycling or manufacturing,” and disputes that Mr. Shapiro, Petitioner’s declarant, qualifies as one of ordinary skill the art. PO Resp. 7–9. Petitioner replies that the claims of the ’228 patent are broader than “wood or paper products recycling or manufacturing” and relate to “processing the broader category of ‘waste materials.’” Reply 2.

We note that the parties’ respective positions are not substantially different. In light of the evidence before us, and our construction of ‘waste materials,’ we adopt Petitioner’s definition of one of ordinary skill in the art. The record reflects no reason to require that one of ordinary skill in the art have five years of experience in wood or paper products recycling or manufacturing. The level of ordinary skill in the art is further demonstrated by the prior art asserted in the Petition. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Overview of the Asserted References

1. Tertyshnikov

Tertyshnikov, titled “Machine for Preparing of Feed,” relates to “apparatus for processing livestock feed of varying consistency and composition.” Ex. 1003, 1:3, 1:9–11. Figures 1 and 2 of Tertyshnikov are reproduced below:

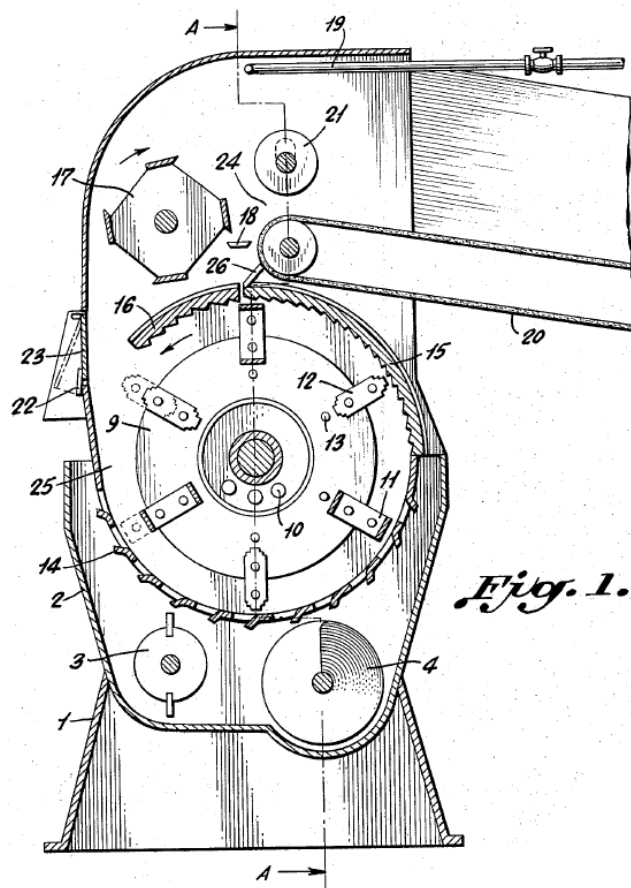


Figure 1 is a longitudinal sectional view of a feed preparation apparatus.

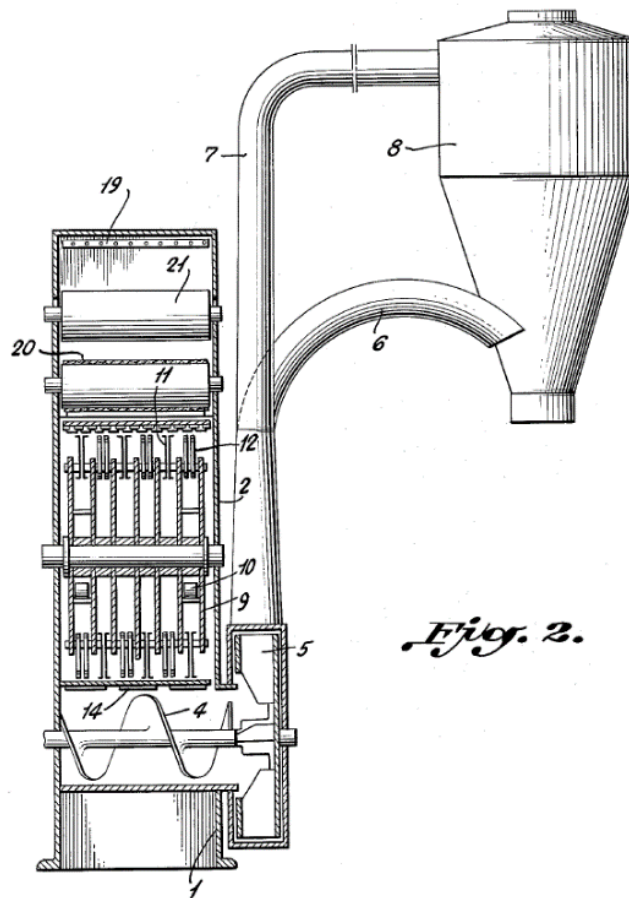


Figure 2 is a sectional view taken substantially on the line A–A of Figure 1.

Tertyshnikov's apparatus "has been designed for preparation of feed with the aid of a set of working elements for chopping and grinding that will also shred straw" with "a set of replaceable sieves (furnished with deflecting hoods, or smooth ones for direct flow sifting, or provided with a hulling surface, or slotted ones, etc.) for adjusting the degree of comminution," as well as with "devices for humidification and for mixing together and discharging the feed mass, these elements to be used in various combinations." *Id.* at 1:38–46. As shown in Figures 1 and 2, the apparatus of Tertyshnikov includes hollow body 2, conveying worm 4, cyclone 8, grinding (crushing) rotor 9, hinged knife means 11, hammers 12, replaceable

sieve 14, main serrated concave 15, additional removable serrated concave 16, perforated pipe 19 “for humidifying the processed mass over the whole width of the machine,” and belt conveyor 20. *Id.* at 1:58–72. Raw materials and nutritional supplements are charged into the mouth of receptacle 24 via belt conveyor 20 to subsequently enter grinder 25. *Id.* at 2:6–11. Processing of the raw materials may involve knife means 11, hammers 12, sieve 14, and discharge into cyclone 8 via pipeline 7. *Id.* at 2:36–41, 2:44–49, 2:63–68. Acid, brine, or alkali solution, and also molasses or artificial urea may be introduced via perforated pipe 19. *Id.* at 3:69–70. Tertyshnikov provides at least seven specific examples that are illustrative, employ certain elements of the machine described and shown in Figures 1 and 2, and are intended for use with different starting materials. *Id.* at 2:24–69.

2. *Reiniger* ’635

Reiniger ’635, titled “Process and Apparatus for the Recovery of Cellulose Fibers from Paper-Plastic Mixtures,” is directed to a process and apparatus that exposes contaminated paper-plastic mixtures to controlled wetting, subjects the wetted mixture to abrasive forces to fiberize the paper component, and separates the fiberized paper cellulose product from the plastics and other contaminants. Ex. 1007, at [54], [57]. In other words, *Reiniger* ’635 relates to the recovery of high grade paper fibers from municipal solid waste, particularly classification of valuable fibers from the light weight fraction of municipal solid waste. *Id.* at 1:13–21, 1:28–30.

Figure 5 of *Reiniger* ’635 is reproduced below:

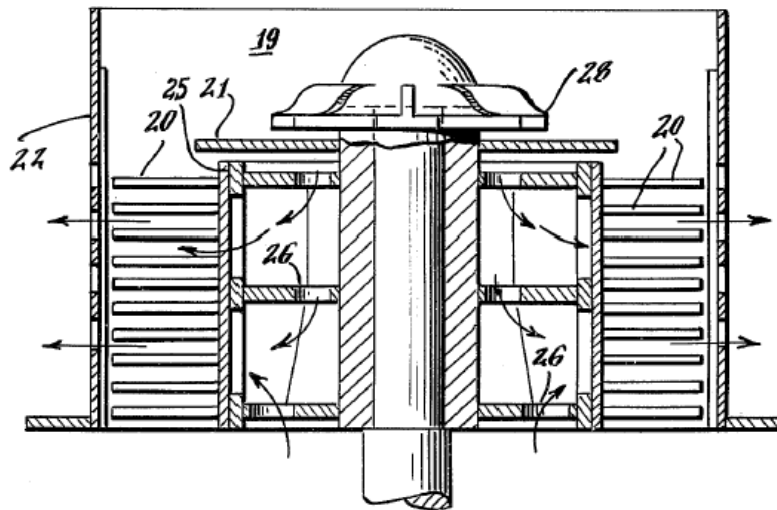


Figure 5 is a side view of a rotor chamber.

“As best seen in FIGS. 5 and 6, the rotor chamber 18 contains a rotor assembly 19” with rotor blades 20 and 21; optional cutting members 30 are not shown but are vertically spaced blades located in the interior of the rotor chamber adjacent to classifier screen 22. *Id.* at 6:4–6, 6:33–35. During operation of the rotor chamber, rotor blades 20 and 21 act as a fan to draw in controlled air, and the waste is spun in the chamber against screen 22 and cutting blades 30, after which heavy small particles fly through screen 22 and are removed from the system, while papers, plastics, and oversize particles are retained. *Id.* at 6:60–68.

Figure 6 of Reiniger '635 is reproduced below:

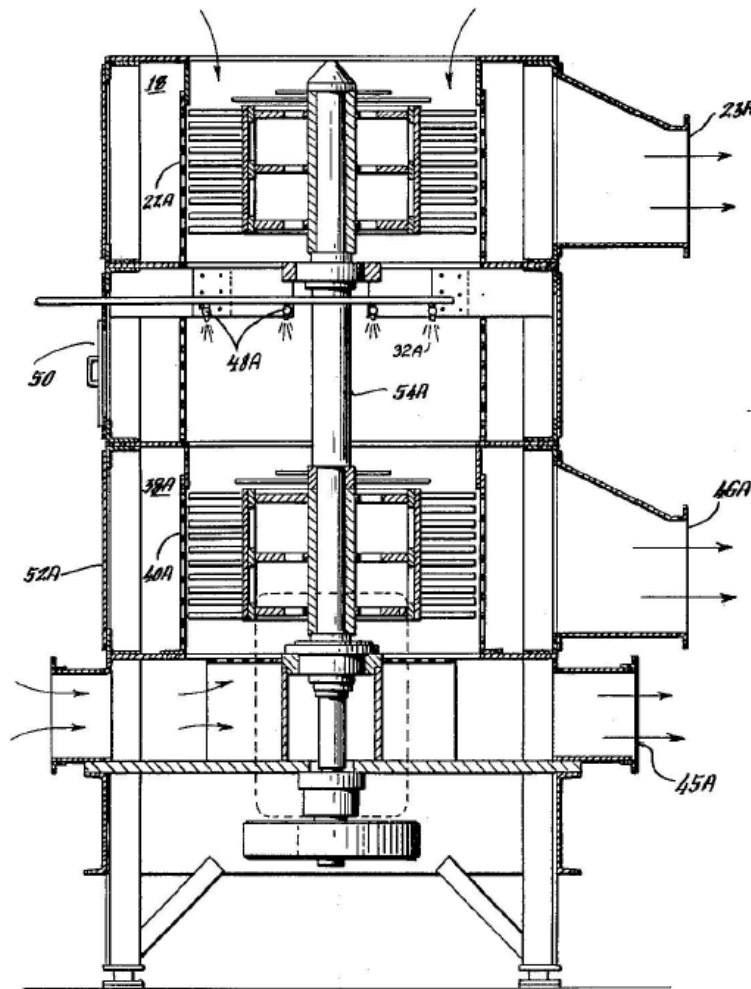


Figure 6 is a side elevational view of another embodiment of a waste recovery apparatus.

According to the specification, Figure 6 shows that “first rotor chamber 18A is stacked on top of second rotor chamber 38A such that the classified feed from 18A falls directly into the second rotor chamber 38A by gravity.” *Id.* at 8:34–37. “Spray showers 48A are provided to allow the addition of the water and other additives such as detergents and wetting agents directly to the classified product of rotor chamber 18A.” *Id.* at 8:36–40. Classified cellulose fibers spin through classifier screen 40A and thereafter are collected through chute 46A. *Id.* at 8:60–62.

3. Reiniger '999

Reiniger '999 is titled "Method and Apparatus for Obtaining Low Ash Content Refuse Fuel, Paper and Plastic Products from Municipal Solid Waste and Said Products" Ex. 1004, at [54]. Reiniger '999 provides an "improved apparatus for use in the treating of raw materials of diverse nature and from various sources, including organics and inorganics, specifically for city garbage, yard trash and refuse having no commercial value," in which "portions of the materials are fragmentized, selected in accordance with material content and size, resulting in select products of low resultant ash content and of low plastic film content, for example, as a uniform refuse fuel product for generating industrial heat and electric power." *Id.* at 2:39–48. A portion of Figure 2 of Reiniger '999 is reproduced below:

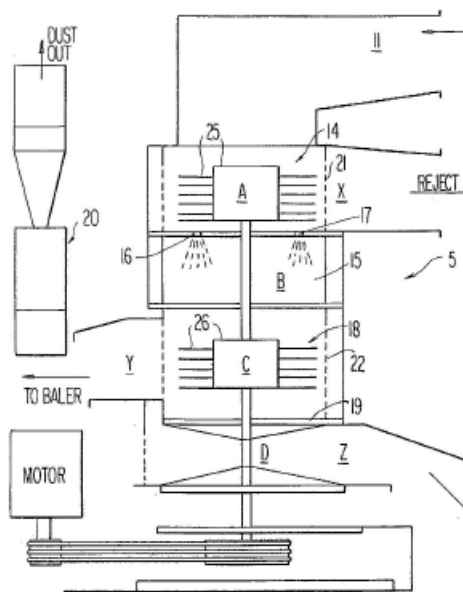


Figure 2 is a schematic side elevational view of an apparatus for producing a chopped paper fuel product from municipal solid waste.

In the dual rotor fragmentizer and sorter 5 of Figure 2 of Reiniger '999, rotors 14 and 18 operate in cooperation with cylindrical classifier screens, causing controlled size by abrasion shredding, fragmentizing and disintegrating of particles under treatment, while permitting separations and provision for special additives between the rotor zones. *Id.* at 7:63–8:3. Treating zone B or 15 may be employed for introduction of chemicals in solution through showers and sprays 16 and 17, after which secondary or lower rotor stage C comprising rotor 18 and screen 22 permits the separation of materials for suitable industrial processing. *Id.* at 7:47–49, 8:7–20. Cyclone 20 permits direct recovery of the product. *Id.* at 7:54–56.

4. Sawka

Sawka, titled “Method and Apparatus for Painting the Surfaces of Wood Chips,” is directed to painting the surfaces of masses of wood chips by conveying the chips along an elongated path in an auger-type screw conveyor and, simultaneously, spraying predetermined amounts of a liquid colorant or paint upon the mass of moving chips. Ex. 1005, at [54], [57].

Sawka discloses that nozzles spray a liquid colorant or paint onto a tumbling and moving mass of wood chips being conveyed by an auger. *Id.* at 4:18–21, 5:28–31, Fig. 1. According to Sawka, “[t]he colorant or paint is spread upon the surfaces of the wood chips first, by the downwardly directed spray and then by the smearing of the paint caused by the rubbing or contacting of the chips with each other as they tumble and move along the auger screw.” *Id.* at 5:31–36; *see also id.* at 4:66–5:10 (describing how the action of the auger screw causes the wood chips to tumble and rub against each other).

5. *Rondy*

Rondy, titled “Method for Coloring Wood Chips Using a Screw Conveyor,” is directed to converting comminuted wood to a colored wood product by contacting the wood in the lower end of an auger-type screw conveyor by a liquid color-imparting agent. Ex. 1006, at [54], [57].

Rondy teaches that coloration improves the appearance of the wood chips and is critical to the marketability of the product. *Id.* at 1:8–10, 1:23–26. Rondy discloses that wood product is contacted with “an aqueous color-imparting solution containing at least one color-imparting agent therein.” *Id.* at 2:25–27.

D. *Asserted Anticipation Based on Tertyshnikov*

Petitioner asserts that claims 1, 2, 7, and 16 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Tertyshnikov. Pet. 11–21. Petitioner presents a claim chart to demonstrate where Petitioner believes every element of the challenged claims is found in Tertyshnikov. *Id.*

Petitioner contends that Tertyshnikov discloses the preamble and steps (a) through (f) of claim 1, namely, with reference to the numbered elements described in Tertyshnikov:

(preamble) A method for impregnating waste materials with an impregnating agent while concurrently impregnating, suspending, and fragmenting the waste materials in a turbulent fragmenting zone, with hollow body 2 that includes mouth of receptacle 24 and grinder 25 with or without removable serrated concave item 16;

(a) feeding a waste feed of the waste materials to the turbulent fragmenting zone of hollow body 2 via belt conveyor 20 leading to grinder 25;

(b) uniformly injecting the impregnating agent onto the waste materials via perforated pipe 19 “extending uniformly across the width of the fragmenting zone 24, 25” while suspending the waste materials within body 2;

(c) particulating the waste feed to a particulated product using grinding (crushing) rotor 9 with hinged knife means 11, hammers 12, and knife drum 17 by fragmenting and impacting the waste materials within the turbulent fragmenting zone of body 2;

(d) uniformly impregnating the particulated product with said impregnating agent within said turbulent fragmenting zone so as to provide a uniformly impregnated particulated product via perforated pipe 19 adding water, acid, brine, alkali solution, molasses or artificial urea, noting that the specification states the objective of preparing materials “of invariable humidity” (*id.* at 14 (citing Ex. 1003, 1:15–16));

(e) screening the impregnated particulated product to further fragment said product to a desired particle size via sieve 14, which must have deflecting hoods or a hulling surface, in cooperation with grinding rotor 9 with knife means 11; and

(f) recovering the uniformly impregnated particulated product of the desired particle size from said fragmenting zone via conveying worm 4, fan 5, and discharge into pipe line 6.

Id. at 11–15. Petitioner presents similar arguments for the elements of the apparatus of claim 16. *Id.* at 17–21.

Patent Owner contends that Tertyshnikov does not disclose atomizing the liquid and simultaneously impregnating it on newly cut surfaces. PO Resp. 13. Rather, Patent Owner contends, two events (spraying with a liquid

from pipe 19 and material entering grinder 25) happen at different times, and in different areas of Tertyshnikov's machine. *Id.* at 14 (citing Ex. 2001⁷ ¶¶ 46–47).

Patent Owner also argues that Tertyshnikov does not teach that an additive is introduced inside of a turbulent fragmentation zone. *Id.* at 15. In sum, Patent Owner argues, Tertyshnikov “is a machine for making wet or pulpy animal feed of ‘invariable humidity’ or constant water content” (citing Ex. 1002, 1:15–16), whereas the '228 patent “discloses a machine that grinds woodchips and creates new surfaces for coloring and impregnating colorant onto the surface using as little water and dye as possible.” *Id.* at 16 (citing Ex. 1001, 2:10–13; Ex. 2001 ¶ 36). Patent Owner presents a claim chart to demonstrate why Patent Owner believes Tertyshnikov fails to disclose every element of the challenged claims. *Id.* at 12–20.

Petitioner replies that Tertyshnikov teaches a removable knife drum 17, removable fixed knife 18, and additional removable serrated concave 16 that are not present when processing certain materials. Reply 8. Petitioner also argues that Tertyshnikov illustrates “pipe 19 spraying liquid directly into the area with the knife drum 17 (if present) and the grinding chamber 25.” *Id.* at 9 (citing Ex. 1009 ¶¶ 43, 45). Thus, Petitioner argues, Tertyshnikov “discloses concurrently impregnating, suspending and fragmenting the waste material in a turbulent fragmenting zone.” *Id.*

Tertyshnikov, in its general description of its invention, provides that the invention includes a number of items, including “*replaceable* sieve 14 to

⁷ The Declaration of Dr. Sridharan Ramaswamy was filed as Paper 7, but is labelled “St. Martin Ex. 2001” on its face, and Patent Owner's briefs refer to “Ex. 2001” when citing to this declaration.

control the degree of feed grinding,” “additional, *removable* serrated concave 16,” “*removable* knife drum 17,” and “*removable* fixed knife 18.” Ex. 1003, 1:66–69 (emphasis added). In the seven embodiments describing the various components of the “specific examples” of Tertyshnikov, these replaceable elements are present or not present in a variety of combinations, depending on the starting material to be fed into the machine. *Id.* at 2:24–68. The first example, for processing potatoes, root, and melon crops and turning them into a pulp, includes knife drum 17, fixed knife plate 18, and “sieve 14 with deflecting hoods, not shown, is to be installed.” *Id.* at 2:28–34. The second example, for processing coarse silage, coarse plants and/or those with long stalks and turning them into vegetable pulp, includes knife drum 17, fixed knife 18, and “sieve 14 is to be smooth for direct-flow sifting.” *Id.* at 2:36–40. The fourth example, for processing of hay to convert it into hay-meal, includes knife drum 17, fixed knife 18, and “sieve 14 must have deflecting hoods or a hulling surface, not shown.” *Id.* at 2:44–49. The sixth example, for processing of moist or sprouted grain, turns the product into paste “by means of the same working units as for dry grain, but with the addition of water through perforated tube 19,” and involves smooth sieve 14. *Id.* at 2:57–62. The seventh example, for shredding straw, includes knife drum 17 and fixed knife 18, and “sieve 14 is to be used with slotted orifices for deflecting or zigzag sifting.” *Id.* at 2:63–68.

In its claim chart identifying where the Tertyshnikov elements corresponding to the limitations of the challenged claims are found, Petitioner appears to pick and choose among certain embodiments of Tertyshnikov. For example, to disclose “uniformly injecting the impregnating agent onto the waste materials while suspending the waste

materials within the fragmenting zone” of claim 1, Petitioner relies on the sixth example, which uses a sieve that is “smooth for direct-flow sifting.” Pet. 12–13 (citing Ex. 1003, 2:59–60). To disclose “screening the impregnated particulated product to further fragment said product to a desired particle size” of claim 1, Petitioner relies on the fourth example, which involves processing of hay, has a knife drum 17, fixed knife 18, and deflecting hoods or hulling surface on sieve 14. *Id.* at 14–15 (citing Ex. 1003, 2:46–47). To disclose the “cellulosic waste material” of claim 7, Petitioner relies on the second example, which has a smooth sieve for direct-flow sifting. *Id.* at 17 (citing Ex. 1003, 2:36–43). To disclose the “screen for grating and screening the particulated product to a predetermined particle size” of claim 16, Petitioner relies on the fourth example, which involves processing of hay, has a knife drum 17, fixed knife 18, and deflecting hoods or hulling surface on sieve 14. *Id.* at 20 (citing Ex. 1003, 2:46–47).

In order to anticipate the claimed invention, a prior art reference must “disclose all elements of the claim within the four corners of the document,” and it must “disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Petitioner’s ground here is based on anticipation, not obviousness. Petitioner’s argument, however, does not point us to a portion of Tertyshnikov in which the elements are arranged as in the challenged claim(s). The general description of Tertyshnikov’s invention enumerating the various optional and non-optional portions of its invention does not persuasively support Petitioner’s challenge, which is based on and refers to specific configurations of Tertyshnikov’s invention. Petitioner argues that in

Tertyshnikov “there’s a set of replaceable sieves” and “a discussion about how some of the sieves are smooth, as the patent owner points out, but there are also sieves that are not smooth, and you could interchange different elements from the set of sieves according to your need of what you are processing.” Tr. 12:14–18. Interchangeability, however, typically is not a suitable basis for an anticipation argument. Although Tertyshnikov states that “changes and modifications are possible without departing from the concept and scope of the invention” (Ex. 1003, 3:5–7), a challenge invoking this statement this would be more properly be made as part of an obviousness challenge, rather than an anticipation challenge. Petitioner’s challenge here is an anticipation challenge, and Petitioner does not allege that one of ordinary skill in the art would have been motivated to combine the features of the different embodiments relied upon by Petitioner with a reasonable expectation of success.

We also are not persuaded that the various embodiments of Tertyshnikov are necessarily compatible with one another. The fourth example discloses a sieve with deflecting hoods or a hulling surface, while the second example and the sixth example disclose a smooth sieve that would appear to preclude the sieve’s use as a grating surface, as required by the challenged claims. Ex. 1003, 2:36–40, 2:44–49, 2:57–63. At oral argument, Petitioner relied on an example from column 2, lines 33 and 34 of Tertyshnikov, the first embodiment that involves “a sieve that’s not smooth,” and also pointed to sieves discussed at column 2, line 45 (fourth example) and column 2, line 55 (fifth example). Tr. 13:1–13. As noted by Patent Owner, “in the specific disclosure that mentions the use of pipe 19 [i.e., the sixth example], parts 17, 24, 18, are all missing.” *Id.* at 39:17–18.

Moreover, the “sieve is smooth. There is no grating against the sieve. It’s smooth in the specific embodiment that discusses use of the pipe 19.” *Id.* at 39:18–20. Patent Owner’s argument highlights that only the sixth example specifically mentions pipe 19 and the addition of water; pipe 19 is not mentioned in any of Tertyshnikov’s other examples. Accordingly, Petitioner’s anticipation argument with respect to Tertyshnikov requires combining disclosures from separate embodiments. This is not a permissible way to argue anticipation. “[I]t is not enough that the prior art reference . . . includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention.” *Net MoneyIN, Inc.*, 545 F.3d at 1371. “[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.” *Id.* Here, Petitioner does not even argue, much less establish, that Tertyshnikov discloses the limitations of claim 1 “arranged or combined in the same way as recited in the claim.” Instead, Petitioner argues that a person of ordinary skill in the art would rely on the various disclosures of Tertyshnikov’s second, fourth, and sixth embodiments, and possibly others, which cannot support a case of anticipation.

Finally, we are unpersuaded that pipe 19 of Tertyshnikov allows for impregnating the particulated product with the impregnating agent within the turbulent fragmenting zone (claim 1), or constitutes an injection means (claim 16). As noted by Patent Owner, there “has to be both fragmenting and impregnation that occur in the fragmenting zone.” Tr. 20:1–2.

Petitioner argues that Tertyshnikov uniformly injects and impregnates the impregnating agent. Reply 11. Petitioner also argues that Tertyshnikov's Figures 1 and 2 "illustrate pipe 19 extending across the width of the grinder 25 and including perforations over its whole length, and teach distributing liquid into the grinding chamber 25." *Id.* at 12. Petitioner, however, provides no discernible support for this statement. Particularly with respect to Petitioner's assertion that Figures 1 and 2 teach distributing liquid into the grinding chamber 25, we are not persuaded. It is unclear from the drawings whether or how liquid from pipe 19 reaches grinding chamber 25. At oral hearing, Petitioner maintained that "you are still going to have the liquid [from pipe 19] falling into even that lower chamber to the point where one could say that it's concurrent fragmentation and impregnation." Tr. 32:26–33:2. When asked how liquid would fall into the lower chamber with element 16 present, Petitioner replied that liquid would be "falling into the lower chamber because if you look at Figure 2, the holes are directed in a somewhat horizontal fashion. Not a vertical fashion. So the water, as it comes out of those holes, will probably assume some sort of an arcing and move down." *Id.* at 33:5–8. Petitioner added that in Figure 1, "you can envision the water coming, arcing out and falling into the gap between the serrated concave 16 and the wall 23. In any event, water is going to get down in there. Whatever the impregnating agent is coming out of that pipe, it's going to get down in there." *Id.* at 33:8–12. Attorney argument, however, cannot take the place of evidence. *E.g., In re Pearson*, 494 F.2d 1399, 1405 (CCPA 1974). And Petitioner has not directed us to any other evidence sufficient to demonstrate that liquid from pipe 19 reaches grinding chamber 25.

Moreover, it remains unclear to us that Tertyshnikov discloses, either expressly or inherently, that pipe 19 sprays liquid into chamber 25, whether or not the removable elements 16, 17, and 18 are present, such that the particulated product is impregnated within the turbulent fragmenting zone as in claim 1, or such that an injection means as in claim 16 is shown. We understand that a reference need not require word-for-word similarity or perfection, but can anticipate a claim if a person of skill in the art, reading the reference, would “at once envisage” the claimed arrangement or combination. *See Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1071 (Fed. Cir. 2017). Here, however, there are sufficient obstacles present between pipe 19 and chamber 25 (i.e., removable elements 16, 17, and 18) and there is sufficient distance between pipe 19 and chamber 25, that we are not persuaded that the claimed arrangement or combination would have been immediately apparent to one of ordinary skill in the art.

Petitioner also asserts that Tertyshnikov’s statement about “pipe 19 for humidifying the processed mass over the whole width of the machine” to prepare materials “of invariable humidity” supports the argument that Tertyshnikov describes introducing liquids into the fragmenting zone. Reply 12. This portion of Tertyshnikov, however, does not specify when in the process the “invariable humidity” is imparted, or whether it is imparted by pipe 19. Ex. 1003, 1:15–16. Nor does the “width of the machine” statement support Petitioner’s argument, because it does not support that humidification takes place along the entire length or volume of the machine, or that impregnation of waste material occurs all the way through, i.e. within, the turbulent fragmenting zone. *Id.* at 1:70–71. In sum, Petitioner

bears the burden of demonstrating that the limitations of the challenged claims are necessarily or inherently met, and it has not done so.

Based upon our review of the parties' positions set forth in the briefs, and taking into account our decision to institute based on the evidence before us at that time, we are not persuaded, on the full record, by Petitioner's presentation of the evidence based on Tertyshnikov, for at least the reasons discussed above. Accordingly, Petitioner has not established by a preponderance of the evidence that claims 1 or 16 are anticipated by Tertyshnikov. Because claims 2 and 7 depend directly from claim 1, and contain the same limitations, we find that Petitioner has not established by a preponderance of the evidence that claims 2 and 7 are anticipated by Tertyshnikov, for the same reasons given regarding claims 1 and 16.

E. Asserted Anticipation Based on Reiniger '635

Petitioner asserts that claims 1, 2, 7, and 16 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Reiniger '635. Pet. 22–37. Petitioner presents a claim chart to demonstrate where Petitioner believes every element of the challenged claims is found in Reiniger '635. *Id.*

Petitioner contends that Reiniger '635 discloses the preamble and steps (a) through (f) of claim 1, namely, with reference to the numbered elements described in Reiniger '635:

(preamble) A method for impregnating waste materials with an impregnating agent while concurrently impregnating, suspending, and fragmenting the waste materials in a turbulent fragmenting zone, with its “the recovery of high grade paper fibers from municipal solid waste” where “[c]ontrolled amounts of water are added’ to the waste material, among other additives, in rotor chamber 18;”

(a) feeding a waste feed of the waste materials to the turbulent fragmenting zone via belt conveyor 16 to a fragmenting zone that includes first stage rotor chamber 18 extending down through chamber 38A;

(b) uniformly injecting the impregnating agent onto the waste materials via spray showers 48A that inject water or other additives such as detergents and wetting agents while suspending the waste materials within the fragmenting zone of the rotor chambers 18 and 38A;

(c) particulating the waste feed to a particulated product by fragmenting and impacting the waste materials within said turbulent fragmenting zone in first rotor chamber 18 having rotor blades 20 and 21, using ballistic attrition and spinning the waste material in the chamber against screen 22 and cutting blades 30;

(d) uniformly impregnating the particulated product with said impregnating agent within said turbulent fragmenting zone so as to provide a uniformly impregnated particulated product via spray showers 48A to effect optimum moisture and related chemical adjustments;

(e) screening the impregnated particulated product to further fragment said product to a desired particle size via spinning fan blades that impact the waste material against classifier screen 40a; and

(f) recovering the uniformly impregnated particulated product of the desired particle size from said fragmenting zone via chute 46A.

Id. at 22–29. Petitioner presents similar arguments for the elements of the apparatus of claim 16. *Id.* at 31–37.

Patent Owner argues that Reiniger '635 discloses “multiple separate grinding areas, water treatment areas, and separate rotors to remove paper fibers” but fails to disclose “adding water, or an impregnating agent, within

any ‘fragmenting zone.’” PO Resp. 25 (citing Ex. 2001 ¶ 52). Patent Owner further argues that “there is no uniform injection onto the material while suspended in a fragmenting zone.” *Id.* at 26. In addition, Patent Owner argues that if colorant were to be added to the machine of Reiniger ’635, the “water would run off with the diluted stream” and “it would not be effective in colorizing the materials with as little water and dye as possible.” *Id.* (citing Ex. 2001 ¶ 53). Patent Owner also faults Reiniger ’635 for not disclosing screens that are used as a grinding surface for the rotors, arguing that the screens of Reiniger ’635 “are clearly differentiable from the screen claimed.” *Id.* at 26–27 (citing Ex. 2001 ¶ 54). Patent Owner presents a claim chart to demonstrate why Patent Owner believes Reiniger ’635 fails to disclose every element of the challenged claims. *Id.* at 27–32.

Petitioner replies that Reiniger ’635 uniformly injects and impregnates the impregnating agent, in that “[s]pray showers 48A are provided to allow the addition of the water and other additives such as detergents and wetting agents *directly to the classified product of rotor chamber 18A.*” [SIC, 18].” Reply 16 (citing Ex. 1007, 8:34–40, Fig. 6) (emphasis added by Petitioner). Petitioner affirmatively states: “These rotor chambers [first rotor chamber 18 stacked on top of second rotor chamber 38A] constitute the turbulent fragmenting zone.” *Id.* at 17. Petitioner further replies that Reiniger ’635 particulates the waste feed with spinning fan blades that impact the feed against a classifier screen and break it into a sufficiently small size to pass through the screen opening. *Id.* at 17 (citing Ex. 1007, 3:42–58). Petitioner also argues that Reiniger ’635 screens the particulated product to further fragment the particulated product by this same mechanism. *Id.* at 18 (citing Ex. 1007, 3:42–58, Ex. 1009 ¶ 65). Regarding

claim 2, Petitioner argues that intensely colorizing attractive woodchips is not required by claim 2. *Id.* at 18–19.

Petitioner argued variously in its Petition that the “turbulent fragmenting zone” is “rotor chamber 18” (Pet. 22, regarding the preamble; *see also id.* at 26, regarding element (c); *id.* at 27, regarding element (d)), or “includes first stage rotor chamber 18 extending down through chamber 38A” (*id.* at 23, regarding element (a); *see also id.* at 29, regarding element (f)). The Petition also seems to imply that the turbulent fragmenting zone is only lower rotor chamber 38A for purposes of certain elements of claim 1 that require impregnation of the waste materials, such as elements (b) and (d). *Id.* at 24–28. At oral hearing, Petitioner was questioned about the location of the turbulent fragmenting zone in the Reiniger references.

Tr. 33:13–18. Petitioner replied:

So if you look at Reiniger '635, which is 1007, Figure 6, the focus is on -- what happens at the spray nozzles 48A, 32A and below, that top spinning chamber seems to spin out. It says it spins out higher density stuff, which for our purposes we are not concerned with. So higher density stuff like glass and metal and grit and so forth goes out through 23A. And the stuff that we are concerned with falls down into the lower part where it's -- we could say it's fairly, it's concurrently sprayed and chopped in that lower chamber with the spinning of the blades against the screen, which as I discussed earlier, has those cutting blades 30 as shown also in Figure 4 and discussed in the specification. *You are going to get this concurrent chopping and impregnating in the turbulent fragmenting zone which we could say is the zone below where the sprayers are. So that's the turbulent fragmenting zone of interest in this Reiniger '635 patent.*

Tr. 33:19–34:6. Petitioner also said that there “is some chopping going on in that upper chamber, so we could say that the whole thing is [the turbulent

fragmenting zone] . . . we are focusing really more on what’s happening in the lower part.” *Id.* at 34:23–26. Thus, it is unclear what portion of Reiniger ’635 Petitioner intends to constitute the turbulent fragmenting zone. Petitioner bears the burden of demonstrating that each of the elements of the challenged claims is present in the allegedly anticipating reference, arranged as in the challenged claim(s). *Net MoneyIN, Inc.*, 545 F.3d at 1371.

Without clarity as to which portion or portions of Reiniger ’635 constitute the turbulent fragmenting zone, we cannot fairly evaluate Petitioner’s arguments, and Petitioner cannot meet its burden of demonstrating that each and every element is present in the reference. *See Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1327 (Fed. Cir. 2008) (“Failure to prove the matter as required by the applicable standards means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden loses.”).

Moreover, even if we were to consider the entirety of the Reiniger ’635 machine as the “turbulent fragmenting zone,” the preamble of claim 1 requires impregnating waste materials with an impregnating agent while *concurrently* impregnating, suspending, and fragmenting the waste materials in a turbulent fragmenting zone. Ex. 1001, 15:8–11 (emphasis added). The preamble of claim 16 requires a “waste fragmenting and impregnating machine equipped to *concurrently* uniformly impregnate and fragment a waste material with an impregnating agent within a turbulent fragmenting zone.” *Id.* at 16:24–27 (emphasis added). “Whether to treat a preamble term as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent.” *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358 (Fed. Cir. 2010)

(internal quotation marks omitted). “In general, a preamble limits the invention if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). Moreover, if the preamble recites a specific characteristic for a component of an invention recited in the body of the claim, then the preamble must be given patentable weight. *See, e.g., Bell Commc’ns Research, Inc. v. Vitalink Commc’ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) (noting that a claim drafter may choose to use both the preamble and the body of the claim to define the subject matter of the claimed invention). In this case, we determine that the preamble is limiting. The title of the invention is “Concurrent Fragmentation and Impregnation Machine and Processing.” Ex. 1001, at [54]. The specification describes the process as happening “concurrently” or “uniformly and homogenously.” *Id.* at 1:60–65, 4:15–20, 12:32–35. The subsequent steps in method claim 1 include “injecting . . . while suspending” in claim 1, and the subsequent limitations in apparatus claim 16 discuss “injecting and uniformly distributing the impregnating agent within the fragmenting zone while turbulently fragmenting and impregnating the particulated product.” Ex. 1001, 1:15:14–16, 16:32–36. Moreover, neither party disputes that the preamble is limiting; rather, both parties treat the preamble as limiting in that both parties present arguments regarding the concurrent nature of the process.

Petitioner’s arguments regarding the “concurrently” requirement focus on the eventuality that Reiniger ’635 produces a product that is impregnated and fragmented. However, Petitioner’s arguments do not directly address

the “concurrently” requirement as it relates to Reiniger ’635. For example, Petitioner discusses impregnation that only takes place in the lower chamber 38A, or in the lower chamber 38A and additive treating section 32A, of Reiniger ’635. Pet. 24–28. In connection with the “injection means” limitation (c) of claim 16, Petitioner refers to “water showers 17” but does not indicate further where or how these meet the limitation of “injecting and uniformly distributing the impregnating agent within the fragmenting zone.” *Id.* at 35; *see also* Ex. 1003, 4:34–36 (“There are optional water showers 17 at the top of the head box to control the moisture content of the infeed and for dust control purposes.”). Petitioner’s argument, and Reiniger ’635’s figures, support that the impregnating takes place at a later stage than the first suspending and fragmenting steps that take place in upper chamber 18, and perhaps even before the second suspending and fragmenting steps that take place in the lower chamber 38A, i.e., in additive treating section 32A. As Patent Owner notes, “the moisture control chamber, part 32, is spaced in between the first and second rotary chambers. Just as with [Tertyshnikov], the addition of the agent does not include during what is arguably the fragmentation process.” Tr. 29:11–13.

Regarding the particulating and fragmenting limitations, Petitioner relies on the “ballistic attrition” that takes place in the “preliminary attrition stage” in upper chamber 18, in which “heavier particles fly through the classifier screen 22.” Pet. 26 (citing Ex. 1007, 4:38–46). Petitioner also refers to “optional cutting members 30, which are long, sharp, vertically spaced blades that are located in the interior of the rotor chamber adjacent to the classifier screen 22.” Tr. 15:11–13. Petitioner, however, also indicated

that attrition or fragmenting took place in 38A of Reiniger '635. *Id.* at 15:19–16:11.

As with impregnating, it is unclear from Petitioner's arguments where the concurrent fragmenting takes place. The upper chamber 18 and lower chamber 38A of Reiniger '635 appear to fragment separately, with an impregnation stage in between at 32A. Such a stepwise or staged process is contrary to the challenged claims' requirement that the impregnating, suspending, and fragmenting take place concurrently. Neither Petitioner nor Patent Owner proposes a claim construction for the term "concurrently." *See* Pet. 7–9; PO Resp. 10–13. Nor do we find that the common meaning of the term, i.e., at the same time; simultaneously, is in dispute. Instead, Petitioner urges that Reiniger '635's process meets that requirement. When asked at oral hearing about the Reiniger references: "How about the requirement that all of this take place concurrently? . . . How concurrently do these steps have to take place?" Petitioner replied, "It seems like it's concurrently enough. I mean, I'm not aware of any sub limitation within the claim that would put a limit on how quickly these things need to happen in order for it to be concurrent." Tr. 32:16–23; *see also* Pet. 22, 31–32 (discussing "concurrently" limitation). However, from Petitioner's arguments and from Reiniger '635 itself, we understand that the process in Reiniger '635 is done in stages, rather than at the same time or simultaneously. This counsels against a finding that the impregnation, suspending, and fragmentation occur "concurrently" in Reiniger '635. Thus, this limitation of the challenged claims is not met.

Based upon our review of the parties' positions set forth in the briefs, and taking into account our decision to institute based on the evidence

before us at that time, we are not persuaded, on the full record, by Petitioner's presentation of the evidence based on Reiniger '635. Accordingly, Petitioner has not established by a preponderance of the evidence that claims 1 or 16 are anticipated by Reiniger '635. Because claims 2 and 7 depend directly from claim 1, and contain the same limitations, we find that Petitioner has not established by a preponderance of the evidence that claims 2 and 7 are anticipated by Reiniger '635, for the same reasons given regarding claims 1 and 16.

F. Asserted Anticipation Based on Reiniger '999

Petitioner asserts that claims 1, 2, 7, and 16 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Reiniger '999. Pet. 37–43. Petitioner presents a claim chart to demonstrate where Petitioner believes every element of the challenged claims is found in Reiniger '999. *Id.* at 38–43.

Petitioner contends that Reiniger '999 discloses the preamble and steps (a) through (f) of claim 1, namely, with reference to the numbered elements described in Reiniger '999:

(preamble) A method for impregnating waste materials with an impregnating agent while concurrently impregnating, suspending, and fragmenting the waste materials in a turbulent fragmenting zone, with its “method and apparatus for obtaining processed products from waste materials” with “a focus on the ‘lightweight fraction fragmentizer and garbage sorter,’ shown at reference number 5” in Figure 2;

(a) feeding a waste feed of the waste materials to the turbulent fragmenting zone with fragmentizer and sorter 5 at a spot designated by 11;

(b) uniformly injecting the impregnating agent onto the waste materials via spray heads 16, 17 that spray a variety of possible liquids onto

the waste material while suspending the waste materials within the fragmenting zone of treating zone B and rotor stage C;

(c) particulating the waste feed to a particulated product by fragmenting and impacting the waste materials within said turbulent fragmenting zone in Unit 5, which has rotating blades 25, 26 that create “abrasion shredding, fragmentizing and disintegrating and the like of particles under treatment” (*id.* at 39 (citing Ex. 1004, 7:65–8:7));

(d) uniformly impregnating the particulated product with said impregnating agent within said turbulent fragmenting zone so as to provide a uniformly impregnated particulated product via spray heads 16, 17, which spray a variety of possible liquids onto the waste material while it is suspended in the treating zone B and the rotor stage C;

(e) screening the impregnated particulated product to further fragment said product to a desired particle size via screens 21, 22, which can be varied to produce a more effective grind; and

(f) recovering the uniformly impregnated particulated product of the desired particle size from said fragmenting zone via zone Y toward location 20, or via pneumatic conveyor 107 towards cyclone 20.

Id. at 38–40. Petitioner presents similar arguments for the elements of the apparatus of claim 16. *Id.* at 41–43.

Patent Owner asserts that Reiniger ’999 “discloses two shredding areas (parts 2 and 7, Ex. 1004, FIG. 2) before the waste ever gets to what the Petitioners claim comprises the fragmenting zone.” PO Resp. 32. Patent Owner also notes that “there is no injection of water in the putative ‘turbulent fragmenting zone.’” *Id.* In Reiniger ’999, Patent Owner argues, the screens are not used as a grinding surface for the rotors. *Id.* at 33 (citing

Ex. 2001 ¶ 61). Reiniger '999 is “intended to sort and separate non-burnable materials from municipal solid waste to produce burnable materials that can be used as fuel,” Patent Owner argues, and it “does not create new surfaces for coloring the materials.” *Id.* at 33–34 (citing Ex. 2001 ¶¶ 36, 62). Patent Owner presents a claim chart to demonstrate why Patent Owner believes Reiniger '999 fails to disclose every element of the challenged claims. *Id.* at 34–39.

Petitioner replies that Reiniger '999 uniformly injects and impregnates the impregnating agent, in that “the rotors are not separate from the treatment zone for the introduction of fluids,” but rather, “spray heads 16, 17 . . . introduce the liquid onto the material as it is suspended and fragmented in Zone C.” Reply 21 (citing Ex. 1004, 15:5–10). Petitioner also argues that Reiniger '999 screens the particulated product to further fragment the particulated product. *Id.* at 22 (citing Ex. 1004, 12:37–40, 12:68–13:8). Regarding claim 2, Petitioner argues that the disclosed surface treatments of Reiniger '999 anticipate the coloring agent, in that one of ordinary skill in the art “would necessarily appreciate that the liquid surface treatments disclosed in Reiniger '999 would inherently impart coloring change and effect.” *Id.* at 23 (citing Ex. 1009 ¶ 83).

Petitioner argued in its Petition that the “turbulent fragmenting zone” is the upper zone, i.e. rotor stage A, for the purposes of waste materials entering the fragmentizer (Pet. 38, regarding element (a)). In the same claim chart portion discussing element (a), Petitioner also relies on the portion of Reiniger '999 that talks about providing for fragmentizing and disintegrating particles under treatment “while permitting separations and provision for special additives between the rotor zones so that, in effect, there are four

zones within unit 5.” Pet. 38 (citing Ex. 1004, 7:63–8:4). Petitioner does not, as we see it, reconcile Reiniger ’999’s disclosure of “four zones within unit 5” with its element (a) discussion, or its later discussions of which zone or zones constitute the turbulent fragmenting zone. For example, elsewhere, Petitioner argues that “rotors 14 [in rotor stage A] and 18 [in rotor stage C] define fragmentation and ballistic recovery zones – in other words, this is the turbulent fragmenting zone” (Pet. 38, regarding element (a)) and that the unit has “rotating blades 25 [in Zone A], 26 [in Zone C] that particulate the waste feed (*id.* at 39, regarding element (c)). The Petition also seems to imply that the turbulent fragmenting zone is only lower rotor chamber C for purposes of the elements of claim 1 that require impregnation of the waste materials, such as elements (b) and (d). *Id.* at 39 (discussing how “spray heads 16, 17 of Reiniger ’999 spray a variety of possible liquids onto the waste material while it is suspended in the treating zone B and the rotor stage C” (element (b))), and how “spray heads 16, 17 spray a variety of possible liquids onto the waste material while it is suspended in the treating zone B and the rotor stage C) (element (d)). At oral hearing, Petitioner was questioned about the location of the turbulent fragmenting zone in the Reiniger references.

Tr. 33:13–18. Petitioner replied:

So if you look at Reiniger ’635, which is 1007, Figure 6, the focus is on -- what happens at the spray nozzles 48A, 32A and below, that top spinning chamber seems to spin out. It says it spins out higher density stuff, which for our purposes we are not concerned with. So higher density stuff like glass and metal and grit and so forth goes out through 23A. And the stuff that we are concerned with falls down into the lower part where it’s -- we could say it’s fairly, it’s concurrently sprayed and chopped in that lower chamber with the spinning of the blades against the screen, which as I discussed earlier, has those cutting blades 30 as shown

also in Figure 4 and discussed in the specification. *You are going to get this concurrent chopping and impregnating in the turbulent fragmenting zone which we could say is the zone below where the sprayers are. So that's the turbulent fragmenting zone of interest in this Reiniger '635 patent. And it's similar in the '999 patent.*

Tr. 33:19–34:6. Petitioner also stated that there “is some chopping going on in that upper chamber [of Reiniger '635], so we could say that the whole thing is [the turbulent fragmenting zone] . . . we are focusing really more on what's happening in the lower part.” *Id.* at 34:23–26. That statement applied to Reiniger '635 as well as Reiniger '999: “So that's the '635. And you can see a similar thing in the '999. It's a very similar arrangement.” *Id.* at 35:11–12. Petitioner elaborated that there might be “some preliminary chopping going on in that upper chamber indicated generally at 14, but then the material falls through for further processing where it's sprayed, and you have that concurrent fragmentizing, fragmentation and impregnating going on in that lower chamber where you have the spinning blades and screens.” *Id.* at 35:16–20. Thus, it is unclear what portion of Reiniger '999 Petitioner intends to constitute the turbulent fragmenting zone. Petitioner bears the burden of demonstrating that each of the elements of the challenged claims is present in the allegedly anticipating reference, arranged as in the challenged claim(s). *Net MoneyIN, Inc.*, 545 F.3d at 1371. Without clarity as to which portion or portions of Reiniger '999 constitute the turbulent fragmenting zone, we cannot fairly evaluate Petitioner's arguments, and Petitioner cannot meet its burden of demonstrating that each and every element is present in the reference. *See Tech. Licensing Corp.*, 545 F.3d at 1316.

Petitioner's arguments regarding the "concurrently" requirement focus on the eventuality that Reiniger '999 produces a product that is impregnated and fragmented. However, as with Reiniger '635, Petitioner's arguments do not directly address the "concurrently" requirement as it relates to Reiniger '999. For example, Petitioner argues that the impregnating only takes place in the lower rotor chamber C, or in the lower chamber C and treating zone B, of Reiniger '999. Pet. 39. Petitioner's argument, and Reiniger '999's figures, support that the impregnating takes place at a later stage than the first suspending and fragmenting steps that take place in rotor chamber 14 or A, and perhaps even before the second suspending and fragmenting steps that take place in rotor chamber 18, i.e., in treating zone B. As Patent Owner notes: "The treatment zone B is apart from the rotor chambers A and C. They don't take place at the same time." Tr. 30:2–3.

Such a stepwise or staged process is contrary to the challenged claims' requirement that the impregnating, suspending, and fragmenting take place concurrently. Neither Petitioner nor Patent Owner proposes a claim construction for the term "concurrently." See Pet. 7–9; PO Resp. 10–13. Nor do we find that the common meaning of the term, i.e., at the same time; simultaneously, is in dispute. Instead, Petitioner urges that Reiniger '999's process meets that requirement. When asked about both Reiniger references: "How about the requirement that all of this take place concurrently? . . . How concurrently do these steps have to take place?" Petitioner replied, "It seems like it's concurrently enough. I mean, I'm not aware of any sub limitation within the claim that would put a limit on how quickly these things need to happen in order for it to be concurrent." Tr. 32:16–23.; *see also* Pet. 38, 41 (discussing "concurrently" limitation).

However, from Petitioner’s arguments and from Reiniger ’999 itself, we understand that the process in Reiniger ’999 is done in stages, rather than at the same time or simultaneously. This counsels against a finding that the impregnation, suspending, and fragmentation occur “concurrently” in Reiniger ’999. Thus, this limitation of the challenged claims is not met.

Based upon our review of the parties’ positions set forth in the briefs, and taking into account our decision to institute based on the evidence before us at that time, we are not persuaded, on the full record, by Petitioner’s presentation of the evidence based on Reiniger ’999. Accordingly, Petitioner has not established by a preponderance of the evidence that claims 1 or 16 are anticipated by Reiniger ’999. Because claims 2 and 7 depend directly from claim 1, and contain the same limitations, we find that Petitioner has not established by a preponderance of the evidence that claims 2 and 7 are anticipated by Reiniger ’999, for the same reasons given regarding claims 1 and 16.

G. Asserted Obviousness Grounds

Petitioner asserts that a person of ordinary skill in the art would have been led from the above-referenced disclosures of Reiniger ’999 and Rondy or Sawka to a method comprising all of the elements recited in claim 2, which recites: “The method according to claim 1 wherein the impregnating agent comprises a coloring agent.” Pet. 43–48. Petitioner also asserts that a person of ordinary skill in the art would have been led from the above-referenced disclosures of Tertyshnikov and Rondy or Sawka to a method comprising the elements recited in claim 2. Pet. 48–52. In our Institution Decision, we instituted *inter partes* review on the former ground, but not the

latter; we later instituted on all grounds pursuant to *SAS Institute*. See Dec. 29–30; Paper 10.

Claim 2 depends directly from claim 1. We have determined, above, that Petitioner failed to show that all elements of claim 1 are disclosed by either Tertyshnikov or Reiniger '999. Petitioner has not identified any disclosure of the missing elements of claim 1 aside from the arguments rejected above. Accordingly, those same elements remain missing regarding claim 2 insofar as Petitioner relies on Tertyshnikov or Reiniger '999 to disclose them. Petitioner relies on Rondy or Sawka to disclose the “coloring agent” of claim 2, not any to supply the elements of claim 1 that we determined were missing from Tertyshnikov and Reiniger '999. Thus, we do not find that Petitioner has asserted or established by a preponderance of the evidence that Rondy and/or Sawka fill in the shortcomings of Tertyshnikov or Reiniger '999 in that regard. Accordingly, Petitioner does not prevail on its obviousness arguments based on Tertyshnikov, Reiniger '999, and Rondy and/or Sawka.

III. CONCLUSION

For the reasons given, we are not persuaded that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 7, and 16 of the '228 patent are unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 1, 2, 7, and 16 of the '228 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2017-01849
Patent 6,207,228 B1

FOR PETITIONER:

Andrew Grove
Christopher Worrel
HOWARD & HOWARD ATTORNEYS PLLC
jg@h2law.com
cjw@h2law.com

FOR PATENT OWNER:

Alexander Farrell
HELLMUTH & JOHNSON, PLLC
afarrell@hjlawfirm.com