In the United States Court of Federal Claims

No. 06-472C

(Filed: April 27, 2010)

TDM AMERICA, LLC, Plaintiff, v. THE UNITED STATES, Defendant.	Claim for Infringement of Process Patent; Treatment of Waste Materials; Summary Judgment; Literal Infringement; Doctrine of Equivalents; Application of "Batch" and "Weighing" Limitations; Discovery Sanctions.

David W. Denenberg, with whom was *Michael A. Adler*, Davidoff Malito & Hutcher LLP, New York, New York, for Plaintiff.

Walter W. Brown, with whom were *John J. Fargo*, Director, United States Department of Justice, Commercial Litigation Branch, Civil Division, Washington, D.C., *Joshua B. Brady* and *Steven O. Fortney* ,Of Counsel, for Defendant.

OPINION AND ORDER

WHEELER, Judge.

In this patent case, Plaintiff TDM America, LLC ("TDM") claims that the United States Army Corps of Engineers ("USACE") and other federal agencies, through their contractors, infringed four patents owned by TDM for the processing and treatment of contaminated materials for beneficial reuse. The patents originally at issue were U.S. Patent Nos. 5,007,590 ("the '590 Patent"), 5,542,614 ("the '614 Patent"), 5,794,862 ("the '862 Patent") and 6,293,731 ("the '731 Patent").

TDM brought this action on June 21, 2006 under 28 U.S.C. § 1498, alleging that activities by or for the government infringed the four TDM-owned patents. TDM later stipulated to the dismissal of two of these patents ('731 and '590) and thus only two patents remain at issue ('862 and '614). In response to TDM's dismissal of the '731 patent, the Court by consent dismissed Donjon Marine Company as a third-party defendant. The '862 patent is a continuation of the '614 patent. These two patents

describe methods for treating dredged and waste material through the use of land-based techniques.[1]

Pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370, 372-74 (1996), the Court issued a decision on February 20, 2009 detailing the meaning of disputed terms in the patents at issue. TDM America, LLC v. United States, 85 Fed. Cl. 774 (2009). Thereafter, on June 5, 2009, Defendant filed a motion for summary judgment of non-infringement. On July 16, 2009, TDM responded and filed a cross-motion for summary judgment of infringement. Each motion was accompanied by proposed findings of uncontroverted facts and many supporting exhibits. On September 11, 2009, Defendant filed its response and reply brief. TDM, before filing its reply brief, moved to stay the action pending the reexamination of certain patents by the United States Patent Office. On December 8, 2009, the Court denied TDM's motion to stay without prejudice, ordering that the case proceed as to the pending cross-motions for summary judgment. TDM filed its reply brief on January 8, 2010, and the Court heard oral argument on February 24, 2010.

The cross-motions for summary judgment relate to the waste material treatment processes employed by two USACE subcontractors, Clean Earth Dredging Technologies, Inc. ("Clean Earth") and OENJ Cherokee Corporation ("OENJ"), which TDM asserts infringed certain claim limitations of the '614 and '862 patents. Specifically, TDM alleges that the practices of Clean Earth and OENJ infringed claims 2, 3, and 4 of the '862 patent, and that OENJ infringed claims 1, 2, and 4 of the '614 patent. Because the claim limitations at issue in the '614 and '862 patents are worded similarly, the Court has ascribed identical constructions to them. TDM America, 85 Fed. Cl. at 795-97. Two claim limitations in each patent are at issue: (1) accumulating a "batch of waste material," and (2) "weighing" the batch in the mixer to determine the amount of additive to be supplied. Defendant asserts that it is entitled to summary judgment for non-infringement because the Clean Earth and OENJ processes fail to meet these two claim limitations. Defendant contends that the accused processes do not accumulate a "batch" of waste material in the mixer or "weigh" the batch in the mixer as required by the claim limitations. Defendant does not address the other claim limitations of TDM's '614 and '812 patents, and therefore the Court may assume for purposes of the cross-motions that the Clean Earth and OENJ processes infringe those other limitations.

As a further basis for its cross-motion for summary judgment, TDM alleges that Defendant refused to respond adequately to interrogatories and document requests relating to: (1) the methods for processing dredged material utilized by the government's

[1] In an earlier decision, the Court denied Defendant's jurisdictional motion relating to 18 contracts awarded by USACE's New York District. See TDM America, LLC v. United States, 83 Fed. Cl. 780 (2008).

contractors or subcontractors; and (2) the factual basis for the government's contention that it has not infringed any of the claims of patents '614 or '862. (Pl.'s Cross-Mot. for Summ. J. at 3.)

A claim for patent infringement must be proven by a preponderance of the evidence. Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc., 261 F.3d 1329, 1336 (Fed. Cir 2001). Patent infringement is a two-step inquiry. First, the Court must construe the disputed patent claims as a matter of law. Markman, 517 U.S. at 372-74 (1996); Gen. Am. Transp. Corp. v. Cryo-Trans, Inc., 93 F.3d 766, 769 (Fed. Cir. 1996), rehearing denied, (1996), cert. denied, 520 U.S. 1155 (1997). Second, the Court as trier of fact must determine whether the accused product, composition, system, or process contains each limitation of the properly construed claims, either literally or under the doctrine of equivalents. See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997). The first step is a question of law, and the second step is a question of fact. Markman, 517 U.S. at 372-74; Ferguson Beauregard/Logic Controls, Div. of Dover Res., Inc. v. Mega Sys., LLC, 350 F.3d 1327, 1338 (Fed. Cir. 2003.) Having previously construed the asserted patent claims in its February 20, 2009 decision, the Court must now address the second part of the inquiry.

For the reasons explained in detail below, and after carefully considering the parties' positions, the Court finds that there are no genuine issues of material fact, and that Defendant is entitled to judgment as a matter of law. There is no dispute regarding the processes employed by Clean Earth and OENJ, and it is clear to the Court that those processes do not involve accumulating a batch of material in the mixer or weighing the batch in the mixer. Rather, the Clean Earth and OENJ processes are continuous in nature, and do not employ any discrete batches or weighing of batches. Accordingly, the Court grants Defendant's motion for summary judgment of non-infringement, and denies Plaintiff's cross-motion for summary judgment of infringement.

Factual Background[2]

TDM contends that the treatment processes employed at the facilities of two government subcontractors, Clean Earth and OENJ, infringe the asserted claims of the '614 and '862 patents. These treatment processes are described below.

[2] The facts recited in this opinion are taken from Defendant's and TDM's proposed findings of uncontroverted facts and the exhibits referred to therein. The Court is satisfied that the material facts necessary to decide the issues presented are not in dispute.

A. The Clean Earth Process

Clean Earth owns and operates the Claremont Channel Facility in Jersey City, New Jersey. (DX 3 at A21; DX 4 at A33-34.) The facility processes dredged material as a subcontractor for many USACE and U.S. Navy contracts in the New York harbor area. (DX 12 (listing federal contracts); PX 5 at 121.) Typically, at the Clean Earth facility, the treatment process involves mixing dredged material with an additive, usually Portland cement. (DX 3 at A22; DX 5 at A246-47.) The material to be processed is unloaded from barges that dock at the facility, and is placed onto a vibrating screen box. (DX 4 at A37.) The vibrating screen box separates larger lumps of waste material from smaller lumps. (DX 3 at A22; DX 4 at A38-39.) Material less than four inches in size passes through the vibrating screen box into a feed hopper and then onto a moving conveyor belt, where it is transported to a pugmill mixer. (DX 3 at A22; DX 5 at A243-44.) The conveyor belt is equipped with a "weigh bridge" between two rollers that determines the weight of the waste material based upon the amount of deflection of the belt. (DX 3 at A22; DX 4 at A52-53.) A programmable logic controller ("PLC") receives the weight measurement on the conveyor belt and adjusts the amount of additive to be delivered to the pugmill. (DX 4 at A54.) Thus, the waste material is weighed before it enters the mixer. By weighing the amount of waste material as the conveyor belt moves over the weigh bridge, the amount or volume of additive can be determined on a continuous basis, permitting the pugmill mixer to operate without interruption. (DX 3 at A22.) Once the conveyor belt discharges the screened dredged material into the mixer, the determined amount of additive is supplied. Id. The additive and dredged material are combined and mixed in the pugmill mixer. (DX 3 at A22-23; DX 4 at A18-19, 23-24.) The pugmill used in the Clean Earth process contains two counter-rotating steel shafts (running lengthwise in the structure) with extended paddle arms, which mix the material while simultaneously moving the material to the outlet end of the pugmill. (DX 3 at A22-23; PX 5 at 183-85.) After the dredged material is mixed with the additive, the mixture is emptied onto a radial stacking conveyor. (DX 3 at A22-23; DX 4 at A27.) The radial stacking conveyor permits Clean Earth to stockpile the processed material in multiple locations for transport by trucks. (DX 4 at 26-28.) The stacking conveyor also can be positioned over a vehicle for immediate transport of the material. Id. at 27-28.

B. The OENJ Process

From 2001 to 2003, OENJ Cherokee Corporation, later known as Redevelopment Materials, Inc. or RMI, processed dredged material at a site in Bayonne, New Jersey, which OENJ redeveloped as the Bayonne Golf Club. (DX 8 at A319-20, A323-24; DX 9 at A356-59.) OENJ owned the site, but the processing facility was constructed and operated by a subcontractor, EIC Associates, Inc. (DX 8 at A327-28; DX 9 at A350.) The OENJ facility also treated dredged material removed from the New York and New Jersey waterways under various USACE contracts. (DX 12 (listing federal contracts).) OENJ

has not been involved in the treatment of dredged material since 2003. (DX 8 at A331). At its facilities, dredged material was held in a scow until processed. (DX 9 at A359.) A large clam shell excavator removes the dredged material from the scow and places it into a hopper, which directs the material into a vibrating screen box. Id. at A359-60, A362. Material small enough to pass through the screen is discharged from the vibrating box to an elevating structure. Id. at A365. The elevating structure contains closely-spaced and equally sized buckets of a known volume attached to a chain by two sprockets, which transports the material approximately 40-50 feet above the ground to a premixing chamber attached to the pugmill. Id. at A366, A383. The speed of the elevating buckets could be regulated. Id. at A367-68. Based on a measurement of the speed of the buckets and the volume of material in each bucket, the process electronically determines a weight flow rate. Id. at A369-70. These measurements are used to determine the rate at which Portland cement (the additive) is mixed with the dredged material in the premixing chamber. Id. at A368-71, A381. The pre-mixing chamber is a box with an open top and bottom, situated above and slightly offset from the pugmill mixer. Id. at A380. Thus, by two chutes, both dredged material and Portland cement flows into the pre-mixing chamber where they are combined, and then dropped into the pugmill for further mixing. Id. at A368. The pugmill received the combination of dredged material and Portland cement and, by using two shafts with rotating arms, blends and pushes the material along the length of the pugmill box. Id. at A377-78. After the pugmill mixes the material and the cement, the mixture is discharged into a surge hopper, which is located on elevated decks to permit delivery trucks to collect the material while driving beneath. Id. at A378. The surge hopper is equipped with a gate that opens and closes. Id. at A379. Material accumulates in the surge hopper until a truck arrives to remove it. Id. The hopper's gate is then opened to load trucks with the treated material. Id.

C. Description of Patents at Issue

By claiming priority to the same patent application, the '862 and '614 patents are related and share a common specification. Entitled "Processing of Waste Material," the patents describe methods of treating "waste material" through the use of land-based equipment. (DX 1 at A8; DX 2 at A12.) Claim 1 of the '614 patent and Claim 2 of the '862 patent both recite a series of similar steps through which waste material is mixed with an additive in order to be treated. (DX 1 at A9; DX 2 at A19.) In setting forth below the claims alleged to be infringed, the Court has underscored the "batch" and "weight" limitations that are the focus of the parties' motions. Although asserted in independent claims of the '614 patent and '862 patent, these "batch" and "weight" limitations are nearly identical, and as in its Markman opinion, the Court will continue to ascribe identical constructions. TDM America, 85 Fed. Cl. at 795-97.

1. The Claims of the '862 Patent Allegedly Infringed by Both the Clean Earth and OENJ Processes

Claim 2 of the '862 patent reads:

> A method for processing waste materials comprising the steps of:
>
> Receiving a waste material in a vibrating screen box;
>
> Vibrating the vibrating screen box to separate lumps of the waste material that are larger than a predetermined size thereby removing lumps of the waste material of a size larger than the predetermined size from the waste material;
>
> Discharging the waste material of a size less than the predetermined size into a mixer;
>
> Accumulating a batch of waste material in the mixer;
>
> Weighing the batch of waste material to determine an amount of additive to be added to the waste material;
>
> Mixing and homogenizing the waste material with the additive in the mixer to form a mixture;
>
> Dropping the mixture from the mixer to a processing terminus located below the mixer.

(DX 2 at A19, col. 4, lines 17-35 (emphasis added).) All of the limitations in Claim 2 of the '862 patent also are present in the '862 patent claims (claims 3 and 4) because each of those claims recites, inter alia, the "method of Claim 2." Id. at A19, col. 4, lines 35-38.

Claims 3 and 4 of the '862 patent also are alleged to be infringed by the government's processes. Claim 3 is dependent upon Claim 2 and adds the limitation "the waste material is solid or semi-solid." (DX 2 at A19, col. 4, lines 36-37.) Claim 4 also is dependent upon Claim 2 and adds the limitation that "the processing terminus comprises a vehicle." Id. at A19, col. 4, lines 38-39.

2. The Claims of the '614 Patent Allegedly Infringed by the OENJ Process

Claim 1 of the '614 Patent reads:

> A method for processing waste materials comprising the steps of:
>
> Receiving said waste material in a vibrating screen box;
>
> Vibrating said vibrating screen box to separate lumps of the waste material that are larger than a predetermined size thereby removing lumps of said waste material of a size larger than the predetermined size from said waste material;
>
> Discharging said waste material of a size less than said predetermined size into a homogenizer;
>
> Receiving said waste material into said homogenizer;
>
> Homogenizing said waste material in said homogenizer;
>
> Dropping said waste material into a mixer after homogenizing, said mixer located below said homogenizer;
>
> Accumulating a batch of waste material in said mixer;
>
> Weighing said batch of waste material to determine an amount of additive to be added to said waste material;
>
> Mixing said waste material with said additive in said mixer to form a mixture; and
>
> Dropping said mixture from said mixer to a processing terminus located below said mixer.

(DX 1 at A9, col. 3, line 59 to col. 4, line 15 (emphasis added).) All of the limitations in Claim 1 of the '614 patent also are present in the other asserted '614 patent claims (Claims 2 and 4) because each of those claims recites, inter alia, the "method of Claim 1." Id. at A9, col. 4, lines 16, 24. In addition, as construed by this Court in its Markman decision, Claim 2 of the '862 patent is a continuation of Claim 1 of the '614 patent but differs in that it permits the simultaneous mixing and homogenizing of the waste material with the additive in the mixer. TDM America, 85 Fed. Cl at 799-800. In contrast, Claim 1 of the '614 patent calls for the added step of homogenizing after screening the "said waste

material" in "said homogenizer" before "dropping said waste material into a mixer" with "said mixer located below said homogenizer." (DX 1 at A9, col. 3, line 59 to col. 4, line 15.)

Claim 2 of the '614 patent reads:

> The method of claim 1 wherein said waste material is solid or semi-solid.

Id. at A9, col. 4, line 16-17. As noted earlier, Claim 2 of the '614 patent is dependent upon Claim 1 of the '614 patent and adds the limitation that the waste material is solid or semi-solid. TDM incorporates its discussion of the similar Claim 3 of the '862 patent in addressing infringement of Claim 2 of the '614 patent.

Claim 4 of the '614 patent reads:

> The method of claim 1 wherein said processing terminus comprises a vehicle.

Id. at A9, col. 4, line 24-25. Claim 4, like Claim 2, of the '614 patent is dependent on Claim 1 of the '614 patent and adds the limitation that the terminus comprises a vehicle. TDM incorporates its discussion of the similar Claim 4 of the '862 patent in addressing infringement of Claim 4 of the '614 patent.

Discussion

A. Standards for Summary Judgment of Infringement

In this case, no genuine issue of material fact exists and therefore summary judgment may be granted. The Rules of this Court provide that a motion for summary judgment should be granted "if the pleadings, the discovery and disclosure materials on file, and any affidavits show that there is no genuine issue as to any material fact and that the movant is entitled to judgment as a matter of law." RCFC 56(c). Patent infringement issues are questions of fact but summary judgment of non-infringement nonetheless is proper when the moving party shows that "on the correct claim construction, no reasonable jury could have found infringement on the undisputed facts or when all reasonable factual inferences are drawn in favor of the patentee." TechSearch, LLC v. Intel Corp., 286 F.3d 1360, 1371 (Fed. Cir. 2002); see also, Bus. Objects, S.A. v. Microstrategy, Inc., 393 F.3d 1366, 1371-72 (Fed. Cir. 2005).

To establish infringement, the plaintiff must prove by a preponderance of the evidence that every limitation set forth in a patent claim is found in the accused product

or process either literally or by a substantial equivalent. Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1535 (Fed. Cir. 1991) (emphasis added). This standard is known as the "all elements" rule. See Warner-Jenkinson, 520 U.S at 29. The Court must compare the construed claim to the accused device or process to determine whether all of the claim limitations are present either literally or by a substantial equivalent. Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1247-48 (Fed. Cir. 1999). Failure to meet even a single element within a claim precludes a finding of literal infringement. Laitram Corp., 939 F.2d at 1535.

1. Literal Infringement

Generally, a claim is literally infringed if each properly construed claim element reads on the accused product or process. Allen Eng'g Corp. v. Bartell Indus., 299 F.3d 1336, 1345 (Fed. Cir. 2002). "If a claim reads merely on a part of an accused device, that is enough for infringement." Sun Tiger, Inc. v. Scientific Research Funding Group, 189 F.3d 1327, 1336 (Fed. Cir. 1999.)

2. Doctrine of Equivalents

Even if outside the literal meaning of the claims, an accused process or device can still be found to infringe under the doctrine of equivalents if it is the substantial equivalent of the patented invention. See Warner-Jenkinson Co., 520 U.S. at 34, 41; Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 732 (2002) ("The scope of a patent is not limited to its literal terms but instead embraces all equivalents to the claims described."); see also Freedman Seating Co. v. American Seating Co., 420 F.3d 1350, 1358-59 (Fed. Cir. 2005). The doctrine, however, is not applied to the invention as a whole; it is applied to the individual elements of the claimed invention. Warner-Jenkinson Co., 520 U.S. at 29 ("Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole."); see also Kahn v. General Motors Corp., 135 F.3d 1472, 1478 (Fed. Cir. 1998), cert denied, 525 U.S. 875 (1998). "When two elements of the accused device perform the same function as a single element of the patented invention, or when separate claim limitations are combined into a single element of the accused device, a claim limitation is not necessarily vitiated, and the doctrine of equivalents may still apply if the differences are insubstantial." Eagle Comtronics, Inc. v. Arrow Commc'n Labs, 305 F.3d 1303, 1317 (Fed. Cir. 2002) (citing DeMarini Sports, Inc. v. Worth, Inc., 239 F.3d 1314, 1332 (Fed. Cir.2001)). However, "[u]nder the 'all-elements rule,' there can be no infringement under the doctrine of equivalents if even one limitation of a claim or its equivalent is not present in the accused device or method." RF Del., Inc. v. Pac. Keystone Techs., Inc., 326 F.3d 1255, 1266 (Fed. Cir. 2003). Moreover, "if a theory of equivalence would entirely vitiate a particular claim element, partial or complete judgment should be rendered by the court, as

there would be no further material issue for the jury to resolve." Warner-Jenkinson Co., 520 U.S. at 39 n.8 (emphasis in original). The purpose of the doctrine of equivalents is to ensure that an accused infringer cannot avoid infringement simply by changing "minor or insubstantial details of a claimed invention while retaining their essential functionality." Sage Products, Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1424 (Fed. Cir. 1997). The test of equivalence is whether the differences between the accused device or process and the claimed device or process are insubstantial to one of ordinary skill in the art. Abraxis Bioscience, Inc. v. Mayne Pharma (USA) Inc., 467 F.3d 1370, 1381-82 (Fed. Cir. 2006); see also Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 609 (1950).

C. Literal Fulfillment of "Batch" and "Weighing" Claim Limitations

Defendant alleges that both the Clean Earth and OENJ processes fail to literally meet the "batch" and "weighing" limitations set forth in the asserted claim methods of the '614 and '862 patents and thus, the processes do not infringe any of the claims at issue.

1. The "Batch" Limitations

Claim 1 of the '614 patent contains the step of "accumulating a batch of waste material in said mixer . . . ." (DX 1, A28, col. 4, line 8.) Claim 2 of the '862 patent contains similar language. (DX 2, A19, col. 4, line 28 ("accumulating a batch of waste material in the mixer . . . .").) The Court will refer to each of these similar claim limitations collectively as the "batch" limitations.

Defendant argues that since both accused processes are continuous, neither one of the processes literally meets the "batch" limitations. (Def.'s Mot. for Summ. J. at 16.) The Court construed the patents' "batch" limitations to restrict the claimed processes to "batch processes" as opposed to "continuous processes." TDM America, 85 Fed. Cl. at 796. Defining the term "batch" as a "discrete amount of material," the Court found that a "batch process" can be understood as "one in which a quantity of material enters a system and is removed all at once before any additional material is added." Id. The Court further concluded that the batch and batch process definitions "contrast sharply with the notion of a continuous process in which material flows constantly in and out of a mixer during the treatment process." Id. Under the Court's construction of the "batch" limitations, Defendant argues that the "continuous processes" at the Clean Earth and OENJ facilities cannot be found to infringe.

First, Defendant maintains that Clean Earth's process is a continuous process because the conveyor belt continuously feeds material into a pugmill that is constantly mixing dredged material and additive, and continuously discharging this material. (DX 3 at A22-23.) Defendant does acknowledge that a document entitled The Final Report on the Bark Camp Demonstration Project ("Report") described the Clean Earth process as a

"continuous batch." (DX 7 at A293.) However, Defendant claims that despite the Report's "continuous batch" label of the process, the process never operates as a "batch process" as defined by the Court. Rather, Defendant states that the Report's use of the word "continuous" in describing Clean Earth's treatment only serves to reinforce that the process is continuous. (Def.'s Mot. for Summ. J. at 9, n.8; DX 7 at A293.)

TDM argues that Clean Earth's process of pushing screened waste material along a conveyor belt results in a discrete amount of material accumulating on the belt at a given time. According to TDM, the pressure of the discrete amount of material on the weigh bridge allows the calculation of the weight and thus, the amount of additive to be supplied when the material reaches the mixer. After the weight of a discrete portion of material is determined, only then is the material advanced along the conveyor belt to the pugmill and then the next "batch" (as TDM labels it) is weighed. To support its assertions, TDM cites the deposition of Mr. Steven Sands, president of Clean Earth, in which he states that "there is a belt scale that weighs a portion of dredged material, yes." (DX 4 at 51 (emphasis added).) TDM argues that, contrary to Defendant's contentions, this discrete amount of material from the conveyor belt is added to the mixer. TDM asserts that the accumulation of the weighed material in the mixer with the additive satisfies the Court's construction of the term "batch." To TDM, whether or not another amount of material is loaded in the front end of the pugmill while the previous amount of material is discharged from the outlet end of the mixer, does not change the fact that a discrete amount of material accumulated in the mixer for processing (even if for a short period of time). TDM's expert, Mr. Ritchie Studer, states that Clean Earth's process may even stop at times to allow a discrete amount of material to accumulate in the mixer, by slowing the outflow of material based on the time required to mix or remove the batch. (Studer Decl. at ¶¶ 35-38.) Mr. Studer further explains that, because the weight of discrete amounts of material is calculated during the movement of the material to the mixer and these weights vary, flow rates into and out of the mixer also are not equal. Id. The difference in flow rates, therefore, permits the accumulation of material in the mixer.

Regarding the OENJ process, Defendant contends that the flow of waste material also is continuous. The bucket elevator continuously feeds the material into a pre-mixing chamber, which continuously incorporates additive into the chamber before the material and additive are more thoroughly mixed in the pugmill, and then the treated material is discharged into a surge hopper. TDM argues, however, that the accumulation of material from a number of separate and equally-sized buckets in the premixing chamber before flowing into the attached pugmill comprises a "batch." TDM contends that the variable mixing time of 45 to 60 seconds required for each "batch" interrupts the flow and establishes that a certain amount of material "accumulates" in the mixer for processing. Because the buckets of material entering the pugmill are counted to determine weight and the amount of additive required, TDM asserts that a discrete amount of material must accumulate in the mixer. TDM asks the Court to reject Defendant's insistence that the

OENJ's process is continuous and instead, find OENJ's process to accumulate "batch" material in the mixer and thus, to infringe this element of Claim 2.

Defendant emphasizes that neither process treats discrete groups or "batches" of material in the pugmill mixer. No record evidence contradicts this description. If a discrete amount of material or "batch" does accumulate during either of the described treatment processes, the accumulation does not occur in the mixer or pugmill as specified in the claim limitations. The material accumulates on the conveyor belt or in a pre-mixing chamber. This process is not the same as material accumulating in the mixer. Although the president of OENJ's subcontractor, Joseph Branco, did concede that a certain amount of material is retained in the mixer for 45 to 60 seconds while additive is supplied before being discharged, this procedure does not render the process a "batch process." (DX 9 at 39.) The material in the mixer is not entirely discharged before additional material is received. It is difficult to imagine a process in which there is absolutely no pause in flow. After all, the material must pause in the mixer long enough for the additive to be thoroughly mixed. The significant difference between the claimed process and the accused processes is that material continues to flow into the mixer and to be discharged. The flow rate can be adjusted to reduce the addition of material to the mixer. However, the flow of material into the mixer is never completely stopped. Without a complete stop and start in the movement of the material into the mixer, there is no clear, defined separation of the material into what this Court has characterized as a "batch." See TDM America, 85 Fed. Cl. at 796. Under the Court's construction of the batch limitations, the Clean Earth and OENJ processes are continuous, and therefore, fail to satisfy the limitations literally. Id.; see also Bicon, Inc. v. Straumann Co., 441 F.3d 945, 954 (Fed. Cir. 2006) (finding no literal infringement of a dental implant where the claimed implant contained a spherical shaped component and the accused product's similar component was conical in shape.)

2. The "Weighing" Limitations

Claim 1 of the '614 patent contains the step of "weighing said batch of waste material to determine an amount of additive to be added to said waste material." Claim 2 of the '862 patent includes almost identical language providing for "weighing the batch of waste material to determine an amount of additive to be added to the waste material." (DX 2, A19, col. 4, lines 29-30.) The Court will refer to each of these claim limitations collectively as the "weighing" limitations.

The Court construed the "weighing" limitations as requiring: (1) that the weighing occur in the mixer (where the batch is accumulated); and (2) that the batch of waste material be "weighed by direct, or scale, measurement of weight." TDM America, 85 Fed. Cl. at 797. In so doing, the Court excluded a construction that would permit "any method of weighing, including indirect measurements such as volumetric calculations" because they were not supported by the patents' disclosures. Id. Defendant finds the Court's

construction of "weighing limitation" to reject weighing that occurs in locations other than the mixer. Defendant argues that neither the Clean Earth nor the OENJ process allows for a discrete "batch" of material to accumulate in the mixer to be weighed. Clean Earth's process includes a weigh bridge on the conveyor belt transporting the material to the mixer, and does not weigh waste material in the pugmill mixer. The weigh bridge allows Clean Earth to correlate the weight of the material entering the mixer with the amount of additive to be supplied. Defendant also asserts that the OENJ process does not literally meet the Court's defined "weighing" limitation. Again, Defendant maintains that the OENJ facility uses a continuous process in which material is transferred in a bucket system and, based on the speed of the buckets and volume of material in each bucket, a volumetric calculation of the rate of waste material entering the mixer is determined. Defendant emphasizes that in OENJ's process there is no direct weight measurement of the waste material prior to entering the mixer or in the mixer.

Although acknowledging that the Court previously construed "weighing" to mean weighing by direct measurement in the mixer, TDM still maintains that Clean Earth's direct measure of the weight of an amount of screened material on the conveyor belt infringes its claim limitations. TDM states that the '862 patent explicitly provides that a batch weight may be determined by a load cell. TDM, however, misstates the language of the '862 patent. The '862 patent actually says: "[w]aste material is dropped into the mixer until a batch weight has been loaded into the mixer, as determined by load cells <u>on which the mixer is mounted</u>." (DX 2 at A19, col. 3, lines 17-19 (emphasis added).) Thus, the patent limits the calculation of "batch weight" explicitly to the mixer and does not consider the use of load cells in other portions of the process. Despite TDM's allegation to the contrary, Clean Earth's use of a load cell on the conveyor belt does not literally infringe any claim limitations.

The Clean Earth and OENJ processes do not weigh material in the mixer and therefore cannot be found to literally infringe the "weight" limitation.

D. <u>The Accused Processes as Equivalents to the "Batch" and "Weighing" Claim Limitations</u>

Defendant also argues that the accused processes do not infringe the claimed process as none of the steps in the accused processes is substantially equivalent to a claim limitation. In order for the Court to find infringement under the doctrine of equivalents, the patent holder must demonstrate that the differences between the claimed invention and the accused process is insubstantial. <u>Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.</u>, 559 F.3d 1308, 1312 (Fed. Cir. 2009). TDM has failed to satisfy its burden under the equivalency test.

1. Application of Tests for Equivalency

In Voda v. Cordis Corp., the Federal Circuit reiterated the two-part test for equivalents: (1) the "insubstantial differences" standard; and (2) the "function-way-result" standard. 536 F.3d 1311, 1326 (Fed. Cir. 2008). Under the "insubstantial differences" standard, an element in the accused process is found to be equivalent to a claim limitation if the differences between the two are insubstantial. Honeywell Int'l Inc. v. Hamilton Sundstrand Corp., 370 F.3d 1131, 1139 (Fed. Cir. 2004). Under the three-pronged "function-way-result" test, equivalency is found if an element of the accused process "performs substantially the same function in substantially the same way to obtain the same result." Schoell v. Regal Marine Indus., Inc., 247 F.3d 1202, 1209-10 (Fed. Cir. 2001).

2. Application of Vitiation Law

To ensure that the doctrine of equivalents strikes the proper balance between protecting patents and providing sufficient public notice, the "all elements" rule limits the doctrine's scope. Depuy Spine Inc. v. Medtronic Sofamo Danek, Inc., 469 F.3d 1005, 1016 (Fed. Cir. 2006); see also Freedman Seating Co., 420 F.3d at 1358. The "all elements" rule reinforces "the basic patent law principle that claim language defines the scope of an invention and every limitation is material." Id. Therefore, the "all elements" rule requires that equivalence be assessed on a limitation-by-limitation basis, rather than from the perspective of the invention as a whole. Warner-Jenkinson, 520 U.S. at 29 ("Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole."). Also, an element of an accused product or process cannot be considered to infringe a claimed limitation under the doctrine of equivalents if it would result in the limitation being completely read out of the claim – i.e., the limitation would be effectively removed or "vitiated." See Freedman Seating, 420 F.3d at 1358 (holding there is not equivalence as a matter of law "if such a finding would entirely vitiate the limitation"). In essence, the "all elements" rule prevents a patent holder from stretching the doctrine of equivalents to eliminate a claim limitation in its entirety. See Depuy Spine Inc., 469 F.3d at 1016-17 (citing Warner-Jenkinson, 520 U.S. at 29). Thus, "if a court determines that a finding of infringement under the doctrine of equivalents 'would entirely vitiate a particular claim[ed] element,' then the court should rule that there is no infringement under the doctrine of equivalents." Lockheed Martin Corp. v. Space Sys./Loral, Inc., 324 F.3d 1308, 1321 (Fed. Cir. 2003) (quoting Bell Atl. Network Servs. Inc. v. Covad Commc'ns Group, Inc., 262 F.3d 1258, 1280 (Fed. Cir. 2001)).

The Federal Circuit has explained:

> There is no set formula for determining whether a finding of equivalence would vitiate a claim limitation, and thereby violate the all limitations rule. Rather, courts must consider the totality of the circumstances of each case and determine whether the alleged equivalent can be fairly characterized as an insubstantial change from the claimed subject matter without rendering the pertinent limitation meaningless.

Freedman Seating Co., 420 F.3d at 1359; see also Novartis Pharm. Corp. v. Abbott Labs., 375 F.3d 1328, 1339 (Fed. Cir. 2004) ("Permitting such an element in the accused product to come within the bounds of the claimed element would impermissibly extend the scope of the claim language beyond what the patentee actually claimed."); Moore U.S.A., Inc. v. Standard Register Co., 229 F.3d 1091, 1106 (Fed. Cir. 2000) ("If our case law on the doctrine of equivalents makes anything clear, it is that all claim limitations are not entitled to an equal scope of equivalents.").

3. The "Batch" Limitation

Defendant emphasizes that the "batch process" as defined by the Court, "contrasts sharply" with the continuous process utilized by the accused processes here. TDM America, 85 Fed. Cl. at 796. This Court stated in its Markman ruling: "Interpreting 'accumulating a batch' as encompassing a continuous flow of material would fail to give meaning to the term 'batch' as required under the canons of claim construction applied by this Court." Id.

First, Defendant argues that if the Court finds the continuous processes of the OENJ and Clean Earth facilities to meet the "batch" limitations by equivalence, this conclusion would vitiate the limitations. The Court agrees. To find the "batch" limitations to be infringed by a continuous process would effectively read the limitations out of TDM's patents. See Asyst Techs., Inc. v. Emtrak, Inc., 402 F.3d 1188, 1195 (Fed. Cir. 2005) ("To hold that 'unmounted' is equivalent to 'mounted' would effectively read the 'mounted on' limitation out of the patent."). Virtually any waste material treatment process employed would thus be equivalent to the batch limitations and infringe the claimed patents. Tronzo v. Biomet, Inc., 156 F.3d 1154, 1160 (Fed. Cir. 1998) (concluding that in the context of an artificial hip socket "any shape would be equivalent to the conical limitation" and to find infringement would vitiate the limitation).

Moreover, the Court concludes that a finding of vitiation is appropriate because TDM voluntarily chose to claim aspects of the "batch process" as opposed to a "continuous process." Defendant points to the Court's earlier acknowledgment that "[i]f

the patentee meant to describe a continuous flow process, he would have used the words 'ratio' or 'proportion' and not 'batch.'" TDM America, 85 Fed. Cl. at 796. TDM should bear the burden of failing to seek broader protection of its process, rather than forcing the public to bear the costs resulting from the uncertainty of the scope of its claims. Sage Prods., Inc., 126 F.3d at 1425 ("Because th[e] issued patent contains clear structural limitations, the public has a right to rely on those limits in conducting its business activities.").

Further, there are substantial differences between the continuous processes used by Clean Earth and OENJ, and TDM's patented "batch" process that prohibits a finding of equivalence. Both the continuous and batch processes serve the same overall processing function, but Defendant maintains that the government's continuous process serves that function in a "vastly" different way. (Def.'s Mot. for Summ. J. at 23); Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1214 (Fed. Cir. 1998) (holding element of claim to be unmet where power to a motor was applied intermittently in accused device and continuously in patented device.)

In addition to failing the "insubstantial differences" equivalency test, the government's continuous processes also are found not to be equivalent to the claimed process under the function-way-result test. The Clean Earth and OENJ facilities provide the same overall processing function as the "batch" limitations, but in a different manner. The claimed process treats individual "batches" of material, but the government's processes treat a constant flow. See Chem. Separation Technologies, Inc. v. United States, 51 Fed. Cl. 771, 796 (2002) (endorsing an expert's conclusion that "[a] batch treatment is differentiated from continuous flow in that . . . a specific volume of water flows into the tank. And therefore, it reacts. Once reaction is complete, water is allowed then to exit."). In the Clean Earth and OENJ processes, material accumulated on a conveyor belt or in a pre-mixing chamber flows with a predetermined amount of additive into the mixer. Unlike the patented process, the government's treatment processes do not wait for a certain amount of material to accumulate in the mixer to calculate the amount of additive to be incorporated. The evidence establishes that the Clean Earth and OENJ facilities perform the same function as the patented process but in a substantially different way so as not to infringe the claimed limitations. See Engel Indus., Inc. v. Lockformer Co., 96 F.3d 1398, 1406-07 (Fed. Cir. 1996).

4. The "Weighing" Limitation

As described above, the Court's construction of the "weighing" limitation as set forth in its Markman decision requires: (1) that the weighing occur in the mixer; and (2) that the batch of waste material be directly weighed. TDM America, 85 Fed. Cl. at 797. Defendant claims the accused processes do not meet the "weighing" limitations under the doctrine of equivalents. To find that Clean Earth's weigh bridge and OENJ's volumetric

calculation are equivalent to the "weighing" limitation would vitiate the requirement of directly weighing a batch in the mixer.

Substantial differences between the "weighing" limitation of the claims at issue and the methods of measuring the dredged material in the accused processes prevent the Court from finding equivalence. Defendant points to one substantial distinction between the accused processes and the claimed process: "the claims call for weighing a batch of material in the mixer, the accused processes measure the flow rate of the dredged material into the mixer." (Def.'s Mot. for Summ. J. at 25 (emphasis in original).) Defendant is correct. The accused processes do not infringe the claimed "weighing limitation" as construed by the Court. The Court previously ruled in its Markman decision that all weighing must occur in the mixer by direct measurement. TDM America, 85 Fed. Cl. at 797. The accused processes calculate the weight of the waste material using different methods to determine the appropriate flow rates for both the additive and the waste material. By not pausing to weigh a batch of material in the mixer as the patented process does, Clean Earth and OENJ keep the material moving and the treatment process is continuous. There is a substantial difference between the "weighing" elements of the accused processes and the claimed "weighing" limitation in the mixer.

Despite the Court's finding that weighing must occur in the mixer, TDM contends that Clean Earth's step of weighing immediately before the mixer is only an insubstantial difference and, at a minimum, infringes Claim 2 of the '862 patent under the doctrine of equivalents. To TDM, there is no real difference between immediately weighing the mixture before entering the mixer versus weighing it in the mixer (so long as it is performed after screening and prior to the addition of additive). Under the function-way-result test, TDM argues that Clean Earth's practice of weighing the material on the conveyor belt performs substantially the same function, in substantially the same manner, and produces the same result as TDM's process of weighing batches of material in the mixer. TDM alleges that Clean Earth's method still results in a "batch weight" being ascertained. TDM states that Clean Earth determines the weight of the material before incorporating the additive, and uses load cells to calculate the weight.

TDM also asserts that OENJ's process directly measures the weight of a given volume of material, and despite weighing the material prior to discharge into the mixer, bears only minor differences from TDM's patent. Although TDM fails to allege specifically how OENJ directly weighs material, it assumes that OENJ does weigh the material after it is screened and presumes this assumption is sufficient to satisfy its burden. Again, TDM contends there is no significant difference between weighing the accumulated waste material in the mixer and directly weighing the accumulated waste material just before the mixer. TDM also applies the function-way-result test and concludes OENJ's process satisfies this test. Like Clean Earth, TDM claims that OENJ

directly determined the weight of a certain amount of material for the purposes of calculating how much additive to incorporate.

The Court must reject TDM's contentions. The Clean Earth and OENJ processes do not weigh discrete batches in the mixer, and their methods of determining weight and volume are part of a continuous flow into and out of the mixer. A substantial difference exists between the accused processes weighing of a unit of material and TDM's weighing of an entire batch in the mixer. Moreover, while the accused processes might perform substantially the same function, they employ different methods from TDM's process, and thus do not infringe. The claimed process calculates the weight of the waste material after it accumulates in the mixer and then determines the amount of additive needed. In contrast, the accused processes continuously calculate the relative weight of the waste material before it enters the mixer and uses that weight to calculate the necessary flow of additive required. A flow rate therefore is determined as opposed to a batch-specific amount. Neither process directly measures the material as required under the Court's definition of TDM's claimed weight limitation. The Court does not find any infringement here under the doctrine of equivalents.

E. TDM's Request for Sanctions to Bar Defendant from Asserting its Non-infringement Defenses

In its cross-motion for summary judgment and response to Defendant's motion, TDM asks the Court to impose sanctions on Defendant for repeatedly failing to respond to relevant discovery requests and failing to comply with the Court's discovery orders. TDM contends that Defendant should be precluded from asserting non-infringement defenses, and should be required to reimburse TDM for its reasonable expenses, including attorneys' fees, for failing to provide proper discovery responses.

TDM served extremely broad discovery requests upon Defendant aimed at determining the specific methods employed by federal agencies nationwide to treat dredged material. While contractors for the USACE perform much of this work, the USACE is by no means the only federal agency that is responsible for the treatment of dredged material. Collecting the information requested by TDM proved to be a daunting task. Defendant in effect had to request many federal agency offices having no stake in this litigation to review voluminous contract files and then describe the methods used by contractors to treat dredged material. Not all dredging contracts require the treatment of contaminated material. Thus, the search process involved the identification of all dredging contracts, then a further review to see if each contract required any treatment of dredged material, and if so, the determination of the type of treatment process employed. In many instances, compliance with TDM's discovery requests was like "searching for needles in haystacks." Adding to the frustration level were the actions of a combative plaintiff whose counsel saw Defendant's pace as too slow and its responses as inadequate.

In the course of TDM's discovery efforts, there were many motions and responses, and indeed a number of Court orders designed to facilitate the parties' efforts. The Court was of the view that issuance of discovery orders might assist Defendant in expediting the responses from the many federal offices. The volume of discovery activity and Court orders did not so much reflect a non-compliance or failure to cooperate by any party, but rather a joint effort by all involved to obtain the information requested by TDM as promptly and efficiently as possible.

Ultimately, TDM was able to obtain a good understanding of the methods employed by federal agencies to treat dredged materials. TDM did so through its own efforts in compiling available information from the Internet, from its depositions, and from Defendant's discovery responses. The two main sources for the treatment of dredged materials proved to be the Clean Earth and OENJ facilities addressed in this opinion. While the discovery process employed in this case may have been less than perfect, and there may have been some unwarranted delays, TDM is as much responsible for these outcomes as Defendant is. Although perhaps unavoidable, TDM engaged in a "fishing expedition" where it placed heavy burdens on Defendant to respond. Most importantly, TDM did succeed in obtaining sufficient information to pursue its case, and did not suffer any prejudice. The Court denies TDM's request for the imposition of sanctions.

Conclusion

For the foregoing reasons, Defendant's motion for summary judgment of non-infringement is GRANTED and Plaintiff's cross-motion for summary judgment of infringement is DENIED. The Clerk shall enter judgment for the Defendant. No costs.

s/ Thomas C. Wheeler
THOMAS C. WHEELER
Judge