IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

MIKE'S TRAIN HOUSE, INC.,	*	
Plaintiff	*	
v.	*	**CIVIL NO. JKB-09-2657**
BROADWAY LIMITED IMPORTS, LLC, *et al*.,	*	
Defendants	*	

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MEMORANDUM OPINION

Mike's Train House, Inc. ("Plaintiff") brought this suit against Broadway Limited Imports, LLC ("BLI") for alleged infringement of U.S. Patents Nos. 6,457,681 ("'681") and 6,655,640 ("'640"), and against Robert Grubba ("Grubba") for allegedly inducing BLI's infringement. (Am. Compl. 16-18, ECF No. 95). The parties dispute the construction of certain terms of the relevant patent claims, and have asked the Court to construe the claims as a matter of law pursuant to *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed Cir. 1995) (en banc), *aff'd* 517 U.S. 370 (1996). The issues have been fully briefed, and this Court held a *Markman* hearing on March 25, 2011. This Memorandum Opinion sets forth the Court's construction of the disputed claim language.

I. Background

The two patents at issue in this case describe a model train and an electronic system for its control by a user. ('681 Patent, ECF No. 73, Ex. 1); ('640 Patent, ECF No. 73, Ex. 2). The distinguishing features of this system are that it maintains a steady desired speed despite changes in load, (e.g., going up a hill or around a curve), and that it simulates a real train's response to

load changes by emitting more or less smoke and playing more or less "labored" sounds. (Pl.'s Br. 5-6, ECF No. 72).

The speed control process begins when a user enters a speed command on a remote control. (Def.'s Mot. Summ. J. 6, ECF No. 23). The remote control communicates the speed command via radio or infrared signals to a device called a ***track interface unit***, that is connected to the model train tracks. *Id*. The track interface unit then converts the radio or infrared signal into a digital signal, which it transmits to the model train through the train tracks. *Id*. The digital signal is received by an onboard ***processor*** built into the model train. *Id* at 7. The ***processor*** sends a command to a component called the ***motor control circuit***. (Pl.'s Br. 15 Fig. 7, ECF No. 72). A component inside the ***motor control circuit***, the ***motor drive circuit***, adjusts the voltage applied to the ***motor***, making the train go faster or slower. *Id* at 13 n.7. Another component inside the ***motor control circuit***, the ***speed sensor***, sends a signal back to the ***processor*** indicating the train's current speed. *Id* at 16. The ***processor*** then compares the signal from the ***speed sensor*** to the signal from the ***track interface unit*** (i.e., the speed command). *Id*. If the signals do not match, the ***processor*** continues to command the ***motor drive circuit*** to adjust the voltage to the ***motor*** in the desired direction until the two signals are aligned. *Id*.

As a result of the ***processor's*** perpetual comparison of the train's actual speed to the user's speed command, the ***processor*** immediately senses whenever more or less voltage is needed. Thus, by constantly adjusting the voltage, the train is able to maintain a constant speed regardless of changes in operating conditions. *Id* at 13.

The coordination of the train's sound and smoke with changes in speed or operating conditions is accomplished in a similar way, by having the ***processor*** issue commands to smoke and sound control circuits based on changes in the train's *load*. The load is the amount of work the train's motor has to exert to maintain a particular speed. (Pl.'s Br. 21). In Plaintiff's

invention, the ***processor*** calculates the load by comparing the actual speed of the train to the duty cycle being applied to the ***motor***. *Id* at 21-22. The ***processor*** is programmed to recognize a particular duty cycle as the "normal" amount of voltage required to reach a certain speed. '640 Patent, col. 34: 45. Thus, when it senses that a higher duty cycle is being applied to maintain that same speed, it concludes that the train's load is greater. *Id* at col. 34: 45-50. For example, when the train goes up a hill, it will maintain the same speed, but will require more voltage to do so. The ***processor*** interprets this as a higher load, and will adjust the smoke and sound accordingly. *Id* at col. 34: 64 – col. 35: 10.

The parties dispute the meaning of two claim terms related to the speed, sound, and smoke control functions. The first term, ***speed control circuit***, appears in claim 4 of the '681 patent and claim 1 of the '640 patent. The second term, ***when (or as) the model train's load changes***, appears in claims 7, 9, 10, and 13 of the '640 patent. The text of the claims containing these terms and the parties' proposed constructions are set out below:

"SPEED CONTROL CIRCUIT"

'681 Patent, claim 4

4. A model train control system for
controlling model trains on a train track layout,
comprising:

a track interface unit coupled to said train
track layout;

a remote control unit for communicating with the track interface unit;

and a model train comprising:
a processor;
a ***speed control circuit***;
a sound system circuit;
and a smoke unit;

wherein a speed command entered on the remote control unit is communicated to the track interface unit, which passes the command to the model train via rails on the train track layout, the processor in the model train receiving the command and in turn commanding the ***speed control circuit*** to drive the model train to a speed indicated in the speed command, the processor further (1) controlling the sound system circuit to play sounds corresponding to the model train speed, and (2) controlling the smoke unit to produce smoke corresponding to the model train speed.

'640 Patent, claim 1

A model train responsive to commands in the form of data bit sequences, comprising:

a ***speed control circuit*;**

a processor which receives one of said commands corresponding to a desired speed of said train and commands said ***speed control circuit*** to drive said train to said desired speed.

a sound system circuit for playing sounds that simulate real-life train operation sounds;

and a smoke unit for producing smoke from the model train;

wherein the ***speed control circuit*** monitors the speed of the model train and provides the speed to the processor, which then controls the sound system circuit and smoke unit such that the train operation sounds and the smoke correspond to the speed of the model train.

Plaintiff's Proposed Construction:	**BLI's Proposed Construction:**
a closed loop motor control circuit that expressly controls speeds independent of loads (grades, curves, etc.)	a closed loop motor control which (1) has knowledge of the current speed command; (2) monitors the actual speed of the model train over the track; and (3) controls the train's motor to drive the actual speed of the model train over the track to match the speed command despite variations in load.

"WHEN (AS) THE MODEL TRAIN'S LOAD CHANGES"		
CLAIM	**PLAINTIFF'S PROPOSED CONSTRUCTION**	**BLI's PROPOSED CONSTRUCTION**
'640 Patent, claim 7: Volume of Outputted Smoke Changes When The Model Train's Load Changes.	Smoke volume varies relative to actual or simulated load on the model train.	The amount of smoke produced is varied proportionally to the load on the train, even though the speed of the train may remain constant.
'640 Patent, claim 9: Outputted Sound Changes When the Model Train's Load Changes.	Sounds played vary relative to actual or simulated load on the model train.	More or less "labored" sounds are produced according to the current load on the model train, even though the speed of the train may remain constant.
'640 Patent, claim 10: Smoke Changes When the Model Train's Load Changes.	Smoke volume varies relative to actual or simulated load on the model train.	The amount of smoke produced is varied proportionally to the load on the train, even though the speed of the train may remain constant.
'640 Patent, claim 13: As the Model Train's Load changes, There Is A Corresponding Change in the Chuff Sounds and the Puffs of Smoke.	Train operational sounds (chuffs) are selected and played based on the actual or simulated load on the train and the volume of smoke in each puff corresponds to the actual or simulated load on the train.	More or less "labored" "chuff" sounds are produced according to the current load on the model train, even though the speed of the train may remain constant, and that each "puff" contains more or less smoke according to the load on the model train.

II. Standard of Review

Claim construction is a matter of law, to be determined by the Court. *See Markman*, 52 F.3d at 977-78. In interpreting claim language, the first and best evidence of meaning is intrinsic evidence, i.e., the patent itself, including the claims, the specification, and, if in evidence, the prosecution history. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). The goal of claim construction is to give the disputed terms their ordinary meaning, as understood by a person of "ordinary skill in the art" to which the patents pertain, at the time of the invention. *Markman*, 52 F.3d at 986. Such person is deemed to read the terms in the context of the entire patent, including the specification. *Phillips v. AHW Corp.*, 415 F.3d 1303, 1313

(Fed. Cir. 2005) (en banc). The specification is usually "dispositive" and is considered "the single best guide to the meaning of a disputed term." *Id* at 1315 (quoting *Vitronics*, 90 F.3d at 1313).

III. Analysis

A. Speed Control Circuit

The point of contention between the parties is BLI's assertion that the ***speed control circuit*** "has knowledge of the current speed command," and "monitors the actual speed of the model train over the track." (Pl.'s Br. 17-18). The parties agree that the train's ***processor*** actually receives the speed command from the user, and therefore "knows" the current speed command, but BLI maintains that the ***speed control circuit*** must include the ***processor***, while Plaintiff maintains that it does not. *Id*; (Def.'s Resp. 3, ECF No. 87). Similarly, the parties agree that the ***speed control circuit*** monitors the train's speed and communicates it to the ***processor***, but Plaintiff objects to the inclusion of this function in the construction, because it is independently disclosed in the language of claim 1 of the '640 patent. (Pl.'s Br. 18, n.8).

Plaintiff's main argument is that construing the ***speed control circuit*** to "know" the speed command would incorporate functions performed by the ***processor***, which are disclosed separately in the claims. *Id* at 17. Such a construction, it says, would be redundant. BLI maintains, however, that the patents' descriptions of the ***speed control circuit*** can only make sense if the ***processor*** is *part of* the circuit. (Def.'s Resp., *passim*). It further argues that there is no redundancy in this construction, because the ***processor*** performs many other functions as well, and thus has to be disclosed separately, even if it forms part of the ***speed control circuit***. *Id* at 6.

While the Court finds that the patents are at times ambiguous, it is persuaded that BLI's position is correct and that the ***speed control circuit*** cannot perform the functions attributed to it

unless it includes the ***processor***. As Plaintiff argues in its opening claim construction brief, the ***speed control circuit*** described in the patents "is configured to sense train operational changes and adjust the voltage applied to the motor accordingly." (Pl.'s Br. 13). This is made clear in the following passages from the specification of the '640 Patent:

> The speed control system of the present invention comprises a feedback loop that maintains a constant desired speed of the train regardless of motor imperfections and/or load variations such as adding cars, climbing a hill, or traversing a curve. '640 Patent, col. 20:4-8.
>
> This feedback loop will continue, with a continuously increasing duty cycle, until the measured speed is again in a substantially one-to-one correspondence with the desired speed. *Id* at col. 23:18-21.

But, the patents also make clear that the ***processor*** performs the function of comparing the speed command to the actual speed and adjusting the duty cycle of the voltage applied to the motor until the two speeds match:

> The processor 200 also receives a signal from the speed sensor 2073 which is indicative of the actual train speed. The processor 200 compares the desired speed (i.e., speed command) with the actual speed and adjusts the duty cycle accordingly. Ex. 2, col. 21:44-48

In fact, Plaintiff explicitly adopts this language as its definition of the feedback loop, which it claims *is* the ***speed control circuit***. (Pl.'s Br. 16) ("The 'feedback loop' *is* the 'closed loop motor control circuit' contained in MTH's proposed definition of the claimed speed control circuit.") (emphasis added). It is therefore inescapable that the ***feedback loop*** includes the ***processor***, and that the ***speed control circuit*** *is* the feedback loop. The Court, therefore, cannot see any plausible conclusion except that the ***speed control circuit*** incorporates the ***processor***. The ***speed control circuit*** *must*, therefore, both "ha[ve] knowledge of the present speed command" and "monitor the actual speed of the model train." *See Black & Decker v. Robert Bosch Tool Corp.*, 260 F.App'x. 284, 289 (Fed. Cir. 2008) (finding that a claim must be

construed to contain the necessary components to "enable the desired functionality" described in the claims and specification).

The Court further finds that this construction is not redundant, because it incorporates only those functions of the ***processor*** that contribute to the functioning of the ***speed control circuit***. Therefore, to achieve the many other functions that the ***processor*** must perform in order for Plaintiff's invention to work, the ***processor*** must necessarily be disclosed independently. *See id* at 290. Furthermore, the Federal Circuit has written that if intrinsic evidence clearly requires a certain construction of a claim term, district courts should not deviate from that construction merely to avoid redundancy. *Id.* [1]

B. When (as) The Model Train's Load Changes

In its responsive claim construction brief, BLI accedes to Plaintiff's proposed construction of these terms with the exception of the words ***simulated load***. (Def.'s Resp. 6). The Court therefore limits its inquiry to whether the claims can be properly construed to allow for changes in sound and smoke volume in response to a ***simulated load***.

Plaintiff concedes that the words ***simulated load*** do not appear anywhere in the patents, but it argues that they are implied, because loads on a model train must sometimes be simulated in order to appear realistic. (Pl.'s Rep. 5-6, ECF No. 88). For example, a model train might connect to a freight car carrying timber (plastic logs). (Pl.'s Br. 22-23). In real life, the logs would way tons, but the plastic logs are very light, even from the point of view of the model train. *Id*. Thus, to imitate a real train pulling real logs, the extra weight must be "simulated" to make it appear that the train is working harder. *Id* at 23. Plaintiff cites the following passages from the specifications as evidence that the patents contemplate simulating load:

[1] The Federal Circuit was here speaking of redundancy between different claims, (i.e., the doctrine of claim differentiation), but this Court sees no reason that the same principle should not also apply to terms within claims.

> The present invention will control the smoke unit 144 according to the speed and load of the train(s) in order to **simulate** a realistic steam and/or diesel train. In other words, the smoke will be outputted at a rate and quantity that matches the current condition of the train(s), similarly to what takes place in real-life trains. col. '640 Patent, col. 34:5-10.
>
> The amount of smoke or steam will increase, thereby **simulating** a harder working engine. '640 Patent, col. 42:44-48.

Plaintiff argues that the first quotation clearly contemplates ***simulated loads***, because that is the only way to achieve the realism described, and that the phrase "simulating a harder working engine" is actually synonymous with ***simulated load***. (Pl.'s Rep. 6).

The Court, however, finds that the "simulation" referred to in these passages is simply the fact of the model train's being a model. More importantly, Plaintiff does not explain what the physical manifestation of a ***simulated load*** would be, or how it would be accomplished by its invention. While independent claims should not be limited to the embodiments described in the specification, neither may a court give them an infinite scope. Rather, the full scope of a claim must be at least enabled by the specification. *Automotive Technologies v. BMW of North America*, 501 F.3d 1274, 1281 (Fed. Cir. 2007). That is, the specification must describe "the manner and process of making and using [the invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the [invention]." 35 U.S.C. § 112 (West 2011). Plaintiff's patents, however, describe only two ways of changing the train's sound and smoke volume: one is the feedback loop described above, in which the processor responds to changes in *actual* load; and the other is through manual input by the user. There is no suggestion of how to simulate load or make such a simulation affect the output of sound and smoke. The specifications, therefore, do not enable a ***simulated load***.

IV. Conclusion

For the foregoing reasons, the Court construes the disputed claim terms as follows:

1. **'640 Patent, claim 1 & '681 Patent, claim 4: *speed control circuit*** means:

   A closed loop motor control which (1) has knowledge of the current speed command; (2) monitors the actual speed of the model train over the track; and (3) controls the train's motor to drive the actual speed of the model train over the track to match the speed command despite variations in load.

2. **'640 Patent, claim 7:** "Volume of Outputted Smoke Changes ***When The Model Train's Load Changes***" means:

   Smoke volume varies relative to load on the model train.

3. **'640 Patent, claim 9:** "Outputted Sound Changes ***When the Model Train's Load Changes"*** means:

   Sounds played vary relative to load on the model train.

4. **'640 Patent, claim 10:** "Smoke Changes ***When the Model Train's Load Changes***" means:

   Smoke volume varies relative to load on the model train.

5. **'640 Patent, claim 13:** "***As the Model Train's Load changes***, There Is A Corresponding Change in the Chuff Sounds and the Puffs of Smoke" means:

   Train operational sounds (chuffs) are selected and played based on the load on the train and the volume of smoke in each puff corresponds to the load on the train.

Dated this 30th day of March, 2011

BY THE COURT:

/s/
James K. Bredar
United States District Judge