United States District Court,
N.D. Ohio, Eastern Division.

TRIDELTA INDUSTRIES, et al,
Plaintiffs.
v.
FRYMASTER CORPORATION,
Defendant.

June 2, 1998.

Plaintiff brought action seeking declaration of invalidity of four patents relating to controllers for deep fat frying equipment. Following hearing, the District Court, Gwin, J., construed patents at issue.

Patents construed.

4,437,159, 4,549,527, 4,663,710, 4,858,119. Cited.

Joseph A. Castrodale, Maura L. Hughes, Calfee, Halter & Griswold, Cleveland, OH, Charles W. Bradley, Robert M. Isackson, Frank Y. Liao, Lawrence B. Goodwin, Robert A. Cote, Orrick, Herrington & Sutcliffe, New York City, D. Peter Hochberg, Mark M. Kusner, Law Offices Of D. Peter Hochberg, Cleveland, OH, for Plaintiffs.

Luke L. Dauchot, Nicolle M. Clessuras, Kevin M. Magnuson, Thompson, Hine & Flory, Cleveland, OH, Robert G. Krupka, Kirkland & Ellis, Chicago, IL, Jay I. Alexander, Kirkland & Ellis, Washington, DC, David S. Brafman, Carolyn A. Edgar, Kirkland & Ellis, New York City, for Defendant.

OPINION AND ORDER

GWIN**, District Judge.**

Plaintiff Tridelta Industries brings this suit seeking declaration that U.S. Patents Nos. 4,437,159 (the "159 patent") FN1, 4,663,710 (the "710 patent") FN2, 4,858,119 (the "119 patent") FN3, and the 4,549,527 (the "527 patent") FN4 are invalid. Defendant Frymaster counterclaims charging plaintiffs with infringement of each of the patents.

FN1. The '159 patent was issued March 13, 1985.

FN2. The '710 patent was issued May 5, 1987.

FN3. The '119 patent was issued August 15, 1989.

FN4. The '527 patent was issued October 29, 1985.

Pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), the Court conducted a hearing. The Court now construes Defendant Frymaster's patent claims.

I

Plaintiff Tridelta makes controllers for deep fat frying equipment. The plaintiff Pitco manufactures and sells deep fat frying equipment using Tridelta electronic controllers to control the time of cooking various products. The Defendant Frymaster manufactures and sells deep fat frying equipment and the controllers used in that equipment. Frymaster owns the patents in suit.

Here, the Court is asked to interpret the claims involved in Defendant Frymaster's patents. As might be anticipated, Defendant Frymaster asks this court to broadly interpret the claims. Plaintiff Tridelta suggests a narrow construction of the claims.

II

[1] The construction of a patent, including terms of art within its claim, is a question of law. *See* Markman, 517 U.S. at 383-91, 116 S.Ct. 1384.

[2] In resolving a claim of patent infringement, a court must "first determine the meaning and scope of the patent claims at issue, a question of law, before the factfinder may resolve whether the accused device infringes the patent claims as construed by the court, a question of fact." Storer v. Hayes Microcomputer Prod., Inc., 960 F.Supp. 498, 500 (D.Mass.1997).

[3] In construing a patent claim, the Court looks first to the three sources of intrinsic evidence of record: the patent itself, including the claims, the specification, and, if in evidence, the prosecution history. Genentech, Inc. v. Boehringer Mannheim GmbH, 989 F.Supp. 359, 363 (D.Mass.1997) (citations omitted).

[4] [5] The Court first examines the language of the claim. A construing court does not accord the specification, prosecution history, and other relevant evidence the same weight as the claim itself, but consults these sources to give the necessary context to the claim language. *See* Eastman Kodak Co. v. Goodyear Tire & Rubber Co., 114 F.3d 1547, 1555 (Fed.Cir.1997). Terms used in the claim are to be given their ordinary and customary meaning "unless another meaning is specified or evident from the patent history." Storer, 960 F.Supp. at 501 (citations omitted).

[6] [7] [8] The specification "acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). The specification "is always highly relevant to the claim construction analysis" and is the "single best guide to the meaning of a disputed term." *Id*. The patentee may choose to use terms in a manner other than their ordinary meaning, so long as the special definition of such terms is stated in the patent specification or file history. *Id*.

[9] [10] In interpreting the claims and specification, the construing court interprets words "as one of skill in the art at the time of the invention would understand them." Eastman Kodak, 114 F.3d at 1555. In addition, "the court should also consider the patent's prosecution history ... in order to ascertain the true meaning of the language used in the patent claim." *Markman,* 52 F.3d at 980; *see also* Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 452 (Fed.Cir.1985) ("[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance.").

[11] [12] The Court looks to extrinsic evidence to assist in construing a patent claim only if the intrinsic evidence is ambiguous.FN5 During the *Markman* hearing on these claims in this Court on April 23, 1998, the defendant offered no witnesses. The plaintiffscalled a Dr. Francis L. Merat, an electrical engineering professor at Case Western Reserve University. The Court has confined the construction of these claims to the actual language of the claims, the specifications, and the prosecution history. When Dr. Merat's testimony could be construed as expert evidence, and thus extrinsic evidence, the Court has not relied on it.

FN5. *See* Vitronics, 90 F.3d at 1583-85; *Markman,* 52 F.3d at 980-81. Thus, "[i]f a court is able to discern the meaning of a patent's claims after considering these three sources of intrinsic evidence [i.e. the patent claims, specification and prosecution history], it should not look further to expert testimony or other evidence not part of the public record...." Revlon Consumer Prod. Corp. v. L'Oreal, 170 F.R.D. 391, 393 (D.Del.1997). Opinion evidence on claim construction, "is no better than opinion testimony on the meaning of statutory terms." Vitronics, 90 F.3d at 1585.

III

Defendant Frymaster suggests that the prosecution history of its claims is of little relevance to this Court's claim interpretation. Defendant Frymaster says that limitations in the specification cannot be incorporated into the claims. However, if a patent applicant choose to use "means plus function" expressions, federal patent law says:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and *such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.* (emphasis added)

35 U.S.C. s. 112, para. 6.

In Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214 (Fed.Cir.1996), *cert. denied,* 521 U.S. 1104, 117 S.Ct. 2480, 138 L.Ed.2d 989 (1997), the Court described this:

Prosecution history is relevant not only for purposes of prosecution history estoppel but also for construing the meaning and scope of the claims. *See* Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 1270 (Fed.Cir.1986) ("While it is true that the effect of prosecution history arises as an estoppel when applying infringement analysis under the doctrine of equivalents, the prosecution history can and should, where relevant, be assessed (along with, e.g., claim language and specification) in properly interpreting claim language." (citations omitted)) [*cert. denied,* 479 U.S. 1030, 107 S.Ct. 875, 93 L.Ed.2d 829 (1987)]; McGill Inc. v. John Zink Co., 736 F.2d 666, 673 (Fed.Cir.1984) [, *cert. denied,* 469 U.S. 1037, 105 S.Ct.

514, 83 L.Ed.2d 404 (1984)] ("Prosecution history may be used not only in an estoppel context but also as a claim construction tool."), *overruled on other grounds, Markman,* 52 F.3d at 976, 979. Indeed, prosecution history is a proper claim construction tool. See *Markman,* 52 F.3d at 980 ("To construe claim language, the court should consider the patent's prosecution history...."); Builders Concrete, Inc. v. Bremerton Concrete Prods. Co., 757 F.2d 255, 260 (Fed.Cir.1985) ("[T]he prosecution history of all claims is not insulated from review in connection with determining the fair scope of [a] claim.... To hold otherwise would be to exalt form over substance and distort the logic of this jurisprudence, which serves as an effective and useful guide to the understanding of patent claims.").

* * * * * *

Statements made during the prosecution relating to structures disclosed in the specification are certainly relevant to determining the meaning of the means-plus-function limitations of the claims at issue.

Id. at 1220 (some citations omitted).

[13] In claim interpretation, the specification in drawing aids interpretation only as far as ascertaining the meaning of a claim unless the inventor describes the claims of the patent in means-plus-function language. If the claims are described in means-plus-function language, the specification sets boundaries for the scope of claims.

Here, the specifications help define terms used in Frymaster's claims. For example, Patent '159 uses a means-plus-function limitation of "periodically adjusting said cooking time by applying a time compensation factor to compensate for changes in said temperature of said shortening, the magnitude of said periodic adjustments being proportional to said time compensation factor and a difference between a set point temperature and a temperature of said quantity of shortening ..." The accompanying specifications define the terms "time compensation factor" and "magnitude of periodic adjustments being proportional." As such, the prosecution history, including specifications, can be used to construe the claim.

IV

The '159 patent is entitled a "Cooking Computer" and is for use with a deep fat fryer having a temperature sensing probe. That probe feeds a signal to a microprocessor. The microprocessor provides internal cook cycle timers which are alterable by signals from the temperature probe to correspond to changes in the rate of cooking of a commestible. Up to twelve recipes, each of which includes a cooking time and a temperature compensation, can be stored in a EAROM.FN6 Cooking times and time compensation factors stored in recipes are user alterable through a keyboard.FN7

FN6. Electrically Alterable Read Only Memory.

FN7. The purpose of the sensitivity factor in the '159, '710 and '119 patents is to provide different cooking curves.

The only way disclosed in the specification of the '159 patent for adjusting the cooking time to correspond to increases or decreases in the temperature of the cooking oil, with respect to the set point temperature, involves multiplying the sensitivity factor by the computed difference between the set point temperature and

the cooking temperature.

The only way disclosed in the '159 patent for adjusting the cooking time in the manner claimed is by means of an integration routine that involves (1) subtracting the actual temperature (Ta) from the set point temperature (Ts), to form (Ts-Ta), (2) dividing the result by 2, and multiplying by a sensitivity factor (K), to form (K) (Ts-Ta)/2, (3) adding the result to an accumulator, (4) comparing the sum into the accumulator to the set point temperature, (5) repeating the foregoing steps (1) to (3) over and over, and (6) after each repeat, comparing the sum to the set point temperature, and (7) if the sum exceeds the set point temperature, adding one second to the cooking time.

Claims 1, 5, 11, 15 & 16 Limitations of the '159 Patent

The Court finds that these claims involve a(a) "means for sensing a temperature of a quantity of shortening in a well of a deep fat fryer"; (b) "means for timing a cooking cycle of a product within said shortening using said cooking time and (1) periodically adjusting said cooking time by applying a time compensation factor to compensate for changes in said temperature of said shortening, (2) the magnitude of said periodic adjustments being proportional to said time compensation factor and a difference between a set point temperature and a temperature of said quantity of shortening"; (c) and a "control panel means for changing said stored cooking time and said time compensation factor in a reprogramming operation."

[14] The Court further finds that the "means for sensing temperature" is a temperature sensor that has a resistance value that varies linearly with temperature and a constant current source.

[15] [16] The "means for timing" limitation is an apparatus that uses a sensitivity factor (K), which the user can program or alter, and which determines the magnitude of the cooking time correction while remaining constant with changing temperatures. The "time compensation factor" is a sensitivity factor that is multiplied by (Ts-Ta) to provide the magnitude that determines whether or not one-second adjustments in the cooking time should be made.

[17] The Court construes the meaning of "the magnitude of said periodic adjustments being proportional to said time compensation factor and a difference between a set point temperature and a temperature of said quantity of shortening", with the use of a microprocessor. The microprocessor is programmed to (a) compute (Ts-Ta), (b) divide it by 2, and multiply it by (K), (c) add the result to an accumulator, (d) compare the sum in the accumulator to the value of the set point temperature, (e) repeat steps (a) to (c) over and over, and (f) after each repeat, compare the sum to the value of the set point temperature. If the sum exceeds the set point temperature, the cooking time is adjusted by one second.

[18] [19] The Court construes the meaning of the "control panel means for changing said stored cooking time and said time compensation factor in a reprogramming operation" to require a keyboard for changing the cooking time and sensitivity factor. The claimed "time compensation factor" is the sensitivity factor with both the cooking time and sensitivity factor ("recipe constants") reprogrammable from a keyboard.

Claim 9 Limitations of the '159 Patent

[20] The Court finds that this claim involves "a cooking computer for use with a deep fat fryer comprising ... a microprocessor which employs a stored program." The microprocessor must be programmed to perform a timing function for periodically adjusting the cooking time by applying a time compensation factor, which is a sensitivity factor, to compensate for changes in the temperature of the shortening. The program must

also initiate adjustments proportional to the sensitivity factor and the difference between the set point temperature and the temperature of the shortening.

The microprocessor performs "a timing function for the timing of a product immersed in said shortening and periodically adjust[s] said cooking time by applying a time compensation factor to compensate for changes in said temperature of said shortening, the magnitude of said periodic adjustments being proportional to said time compensation factor and a difference between a set point temperature and the temperature of the shortening."

Claim 10 Limitation of the '159 Patent

[21] The Court finds that this claim involves a cooking computer as defined in claim 9 with certain cooking times and associated sensitivity compensation factors stored and retrieved from an alterable read-only memory.

Claims 15 & 16 Limitations of the '159 Patent

[22] The Court finds that this claim involves a cooking appliance with a means for receiving a termination signal and for removing the product from the cooking medium. The means for removing the product from the cooking medium is an automatic basket lift that responds to a command signal from the microprocessor.

V

The '710 patent is entitled an "Intelligent Cooking Appliance." The appliance includes a heating source to provide heat to a cooking medium for cooking food, temperature sensing circuitry for detecting the cooking medium temperature and control circuitry connected to the temperature sensing circuitry for cooking the food according to data stored in the control circuitry by controlling the heating source and removing the food from the cooking medium in accordance with the data. A temperature sensing apparatus includes a temperature probe for measuring temperature and a reference circuit indicating a referenced temperature. Circuitry is alternately connected to the temperature probe and the reference circuit for alternatively providing a first and second output signal indicative of the measured temperature and the referenced temperature respectively. Data processing circuitry is also provided that receives the output signals and computes the measured temperature from the first and second output signals.

Claim 1 of the '710 Patent

Defendant Frymaster only is asserting the first four claims in this patent, but only Claim 1 is an independent claim. The Court finds that this claim involves a deep fat fryer with (a) "temperature sensing means for producing a signal indicative of the cooking oil temperature"; (b) "a food transport means for placing food in and removing food from the cooking oil"; and (c) a "processing means connected to said temperature sensing means and temperature control means for": (1) "computing a cooking time and a cooking temperature from said data"; (2) "periodically adjusting the computed cooking time and cooking temperature by timing the cooking of the food within the cooking oil ... during the cooking time and adjusting the cooking time and cooking temperature to compensate for deviations of cooking temperature from the computed cooking temperature"; and (3) "activating the food transport means to remove the food from the cooking oil at the expiration of the adjusted cooking time."

[23] The "temperature sensing means" is a temperature sensor using a constant current source and having a

resistance value that varies linearly with temperature, so that a voltage proportional to the sensed temperature can be supplied to the voltage to frequency converter.

[24] The "food transport means" is an automatic removal apparatus for placing food in the cooking oil and removing it at the expiration of the adjusted cooking time in response to an electronic signal. This limitation covers only a food insertion and removal mechanism.

[25] The functions of the "processing means" in Claim 1 are (1) computing a cooking time and a cooking temperature, (2) periodically adjusting the computed cooking time and cooking temperature by (a) timing the cooking of the food, and (b) adjusting both the cooking time and cooking temperature to compensate for deviations of the cooking temperature from the computed cooking temperature, and (3) activating the food transport means to remove the food.

[26] The structure for the cooking time adjustment FN8 is a microprocessor programmed to (a) subtract the actual temperature (Ta) from the set point temperature (Ts) to produce (Ts-Ta), (b) square this difference to form $(Ts-Ta)^2$, (c) square the sensitivity factor (K) to form $(K)^2$, (d) multiply the squared values together and divide the product by 340, to produce $(K)^2 (Ts-Ta)^2/340$, and (e) add the result to 75. Thus, the result is $75 + (K)^2 (Ts-Ta)^2/340$. When $75 + K^2 (Ts-Ta)^2/340$ pulses are received from the system clock, a second is clicked off the cooking time.

FN8. The only way disclosed in the specification of the '710 patent for adjusting the cooking time to correspond to increases or decreases in the temperature of the cooking oil, with respect to the set point temperature, involves multiplying the sensitivity factor squared by the square of the computed difference between the set point temperature and the cooking temperature. The only way disclosed in the '710 patent for adjusting the cooking time and cooking temperature is by (1) subtracting the actual temperature (Ta) from the set point temperature (Ts), to form (Ts-Ta), (2) squaring the difference, to form $(Ts-Ta)^2$, (3) squaring the sensitivity factor, to form $(K)^2$, (4) multiplying $(K)^2$ by $(Ts-Ta)^2$, (5) dividing $(K)^2 (Ts-Ta)^2$ by 340, and (6) adding the sum to 75.

[27] The structure for the adjustment of the cooking temperature is a microprocessor programmed to compute a corrected temperature by adding (a) the last computed corrected temperature, to (b) the actual measured temperature, and to (c) the average of the temperature increase or decrease for the past six temperature measurements, and to (d) a term based on the extent of time for which the heat was on during the preceding cycle of time, such as 26 seconds.

VI

The '119 patent also is entitled an "Intelligent Cooking Appliance." The device includes a heating source to provide heat to a cooking medium for cooking food, temperature sensing circuitry for detecting the cooking medium temperature and control circuitry connected to the temperature sensing circuitry for cooking the food according to data stored in the control circuitry by controlling the heating source and removing the food from the cooking medium in accordance with the data. A temperature sensing apparatus includes a temperature probe for measuring temperature and a reference circuit indicating a referenced temperature. Circuitry is alternately connected to the temperature probe and the reference circuit for alternatively providing a first and second output signal indicative of the measured temperature and the referenced

temperature respectively. Data processing circuitry is also provided that receives the output signals and computes the measured temperature from the first and second output signals.

Claim 1 Limitations of the '119 Patent

This claim involves a cooking appliance with: (a) a "temperature sensing means for detecting the cooking medium temperature and for generating a frequency proportional to the detected temperature"; (b) a "control means connected to said temperature sensing means for receiving said frequency indicating the cooking medium temperature and for cooking the food according to data stored in the control means, by controlling the heating means"; and a(c) "means responsive to said control means for removing the food from the cooking medium in accordance with said data."

[28] The structure for the temperature sensing means is the circuit in Figure 5 of the '119 patent application. It includes a constant current source, together with at least one resistive probe, the resistance of which varies linearly with temperature. Also, it includes the voltage-to-frequency converter, and a so-called flip-flop, which acts as an ON/OFF switch that is recurrently actuated, each time for a fixed period of time.

The Court notes the prosecution history highlights the importance and limitation of "generating a frequency proportional to the detected temperature." This amendment to the original claim submission was added to distinguish from prior art.

[29] The structure for receiving the frequency and controlling the heating means is a microprocessor programmed to compute a corrected temperature by adding (a) the last computed corrected temperature, to (b) the actual measured temperature, to (c) the average of the temperature increase or decrease for the past six temperature measurements, and to (d) the extent of time for which the heat switch was at the ON position during the preceding cycle of time.

[30] The structure for removing the food responsive to the control means is an automatic removal apparatus activated in response to an electrical signal.

Claims 12, 19, 21, 24 and 33 of the '119 Patent

These claims involve a microprocessor-controlled deep fat fryer with: (a) a "means for sensing the actual temperature of the cooking oil contained in the fry pot"; a(b) "means responsive to the initial cooking time and the sensing means for providing an adjusted cooking time whereby said initial cooking time is varied in response to differences between the actual temperature of the cooking oil and the set temperature."

[31] The means for providing an adjusted cooking time is a microprocessor programmed to (a) subtract the actual temperature (Ta) from the set point temperature (Ts) to produce (Ts-Ta), (b) square this difference to form $(Ts-Ta)^2$, (c) square the sensitivity factor (K) to form $(K)^2$, (d) multiply the squared values together and divide the product by 340, to produce $(K)^2 (Ts-Ta)^2/340$, and (e) add the result to 75. Thus, the result is $75 + (K)^2 (Ts-Ta)^2/340$. When $75 + K^2 (Ts-Ta)^2/340$ pulses are received from the system clock, a second is clicked off the cooking time.

VII

The '527 patent is entitled a "Solid State Temperature Controller." This temperature controller is for a deep

fat fryer and includes a temperature sensing circuit that determines the temperature of cooking oil in the deep fat fryer and which is connected to a temperature control circuit that controls the deep fat fryer heat source in providing heat to the cooking oil in response to a set temperature from an external input device. The control circuit also includes an anticipation circuit that variably modulates the heating source before the cooking oil temperature approaches the set temperature. The temperature control circuit further includes a resistor divider network that provides selected voltages representing reference temperatures and which are input to several operational amplifiers for controlling the heat source.

Claim 1, 6 & 14 Limitations of the '527 Patent

These claims involve a temperature controller for a deep fat fryer with: (a) a "temperature sensing means for determining a temperature of cooking oil in the deep fat fryer"; and a(b) "temperature control means connected to a deep fat fryer heat source for controlling the amount of heat provided to the cooking oil in response to a set temperature from an external input"; (c) said "control means further including anticipation circuit means for variably modulating the heat source before the cooking oil temperature approaches the set temperature."

[32] The structure for temperature sensing means for determining the temperature of cooking oil is a constant current source, using an operational amplifier, a transistor, and a resistor that varies linearly with temperature changes.

[33] The structure for temperature control means includes a potentiometer, several precision resistors, several operational amplifiers, several resistors, capacitors, diodes, and a transistor, which turns the heat ON and OFF.

Two op amps receive the voltage from the temperature sensing probe. Another op amp receives the voltages from the first op amp. Yet another op amp and the surrounding elements produce a string of ON pulses when the cooling temperature is low. This causes a diode to disable an op amp. When the cooking temperature increases sufficiently, the voltage applied by the probe to an op amp reaches the voltage at the junction between two of the resistors. This causes an op amp to turn ON, and to shut off another op amp circuit.

The oscillations performed by one op amp are first fully ON, then oscillate in an ON/OFF state. The ON times of these oscillations diminish as the cooking temperature approaches closer to the set point temperature. A circuit formed by two of the resistors and capacitors also controls the heat to the extent of preventing the ON pulses of heat from diminishing below a preselected duration.

[34] The control means with anticipation circuit structure includes op amps, potentiometer, precision resistors, resistors, and capacitors.

As discussed above, a circuit causes an op amp to turn ON and OFF as the cooking oil temperature approaches the set point temperature-with the ON time of each cycle becoming less and less as the cooking oil temperature approaches closer and closer to the set point temperature. Also, a resistor-capacitor circuit, together with an op amp, prevent the ON pulses from being reduced in duration beyond a preselected amount.

One op amp oscillates to produce a string of recurring pulses. If the cooking temperature were maintained

constant, the pulses in the string would recur regularly and be of a constant duty cycle. As the temperature increases and approaches the set point temperature, however, the duty cycle of the pulses decreases, so that the ON time of the pulses likewise decreases. This decrease in the ON time of the regularly recurring pulses is what is referred to as variable modulation.

VIII

The disputed claims in the four patents are construed as indicated in this opinion. The jury will be so instructed at trial.

IT IS SO ORDERED.

N.D.Ohio,1998.
Tridelta Industries v. Frymaster Corp.