United States District Court,
D. Delaware.

**PHILLIPS ELECTRONICS NORTH AMERICA CORPORATION,**
Plaintiff.
v.
**UNIVERSAL ELECTRONICS INC,**
Defendant.

Civil Action No. 94-392-RRM

**June 26, 1996.**

Patentee brought action against competitor, alleging infringement of its patent for a universal remote control. The District Court, McKelvie, J., held that: (1) patent was not literally infringed; (2) patent was not infringed under doctrine of equivalents; and (3) patent was not invalid under on-sale bar.

Judgment for competitor.

4,703,359. Not infringed.

Bruce M. Stargatt, Josy W. Ingersoll, and James P. Young, Jr., Young, Conaway, Stargatt & Taylor, Wilmington, Delaware, Albert E. Fey, Kenneth B. Herman, Jesse J. Jenner, and Lewis V. Popovski, Fish & Neave, New York City, for plaintiff.

Jeffrey B. Bove and Patricia S. Rogowski, Connolly, Bove, Lodge & Hutz, Wilmington, Delaware, Robert E. Browne, Thomas C. McDonough, Jeannine M. Pisoni, and Mark R. Galis, Vedder, Price, Kaufman & Kammholtz, Chicago, Illinois, for defendant.

## OPINION

McKELVIE**, District Judge.**

This is a patent case. Philips Electronics North America Corporation ("Philips") is the owner of United States Patent No. 4,703,359, which is directed to a universal remote control; that is, a remote control device that can be used to control different types of appliances made by different manufacturers. Philips alleges Universal Electronics Inc. is infringing the patent. Universal Electronics has denied infringement and asserted certain affirmative defenses, and it has counterclaimed for a declaratory judgment that the patent is invalid.

The parties tried this matter to the court from June 19 through June 27, 1995. This is the court's post-trial decision.

### I. *FACTUAL BACKGROUND*

#### A. *The Field of the Invention and Plaintiff's Patent*

## 1. *The Field of the Invention: Remote Control Transmitters*

A remote control device transmits an infrared light beam in a signal structure that can control functions of an appliance, such as a television, radio, videocassette recorder ("VCR"), cable box, or compact disc player. One set of signals from the remote may, for example, turn a television on or off. Another set of signals may turn that television's volume up or down.

Until the early 1980's, the signal structures in remote control devices were designed to operate only one appliance. Because manufacturers adopted different signal structures, each remote control device was dedicated to a particular appliance made by a particular company. Consequently, a remote control for an RCA television would operate that television, but it would not operate an RCA videocassette recorder or a Sony television. This lead to what became known as "remote control clutter."

## 2. *Early 1980's: RCA and GE Develop Remotes for Multiple Devices*

RCA took a step towards solving this problem of remote control clutter in the mid-1980's, when it developed a device that could control multiple appliances of a single manufacturer. RCA obtained a patent on its invention (the "Harger patent") that issued on January 21, 1986, as United States Patent No. 4,566,034, based on an application filed on May 2, 1983. The patent is titled "Remote Control Transmitter Arrangement for One or More Television Devices." It describes including a microprocessor in a remote control device and programming it to operate a manufacturer's different appliances. Thus, the Harger device might control an RCA television and an RCA VCR, but it could not control a Sony VCR or a Jerrold cable converter.

In the early 1980's, General Electric ("GE") developed a remote transmitter that could read and store signal structures for various appliances made by a number of different manufacturers. GE obtained a patent on its invention (the "Welles patent") that issued on November 18, 1986, as United States Patent No. 4,623,887, based on an application filed on May 15, 1984. It is titled "Reconfigurable Remote Control." The patent describes what came to be called a learning remote, in which the user puts a manufacturer's remote head-to-head with the learning remote and, by pushing buttons on each transmitter, transfers the signal structure from the manufacturer's remote to the learning remote. By this approach, the GE learning remote could be programmed to emulate any one of a number of individual remote transmitters.

## 3. *1982: Philips Begins Work on a Universal Remote*

Philips began work on a universal remote control device in the fall of 1982. By March of 1984, it had settled on a plan to design a transmitter that would store the signal structures used by various manufacturers in a memory bank organized by appliance. Larry E. Goodson had the initial idea for the design. Robin B. Rumbold and William R. McIntyre took on the work to implement Goodman's idea. Under Philips's plan, the person using the transmitter would set it to operate one type of an appliance and the transmitter would then cycle through its library of signal structures for that category of appliances until the consumer's appliance responded to the transmitter. The consumer would then set the transmitter so that in the future it would send that signal structure to that appliance. The user could then repeat the process with that transmitter to set it for different appliances.

In the summer of 1984, Philips retained the Turtle Bay Institute to conduct "focus group" marketing research on prototype universal remote controls. In conducting that research, Turtle Bay agreed to keep its research confidential. It tested the universal remotes with four groups in three cities, and it had all participants in the groups sign confidentiality agreements. None of the participants was allowed to leave the discussion room with a prototype remote control or with written information about them.

### **4.** *1985: Philips Files Its Patent Application*

Philips filed an initial patent application for this work on May 30, 1985. On November 20, 1985, it filed a continuation-in-part application that eventually issued on October 27, 1987, as United States Patent No. 4,703,359 ("the '359 patent"). The application's Summary of the Invention reported that the object of the invention is to furnish a universal remote control unit that allows control of different types of appliances as well as appliances made by different manufacturers. The application set out 17 claims, seven method claims and ten apparatus claims. Application claim 1 read as follows:

1. Method for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurality of appliances each responsive to a different signal structure, comprising the steps of:

setting said selected appliance to execute an observable action upon receipt of a response-evoking command signal having said required signal structure;

upon user activation, transmitting in sequence a plurality of response command signals each having a different signal structure until said selected appliance executes said observable action;

storing signal structure identification data corresponding to said required signal structure of said response-evoking command, thereby creating stored product identification data; and

generating subsequent user activated commands with a signal structure associated with said stored signal structure identification data.

On December 3, 1986, a patent examiner filed a first office action on the application rejecting all of the claims, including a number of them as obvious over a German patent to Rosenhagen et al. that was published on October 18, 1984. On March 19, 1987, Philips's patent attorney Marianne Rich responded to the rejection by canceling several claims in the application, amending other claims, and adding new claims. As amended, all claims now required that the remote be able to control "a plurality of appliances of different categories and different manufacturers." Thus, for example, she submitted a new application claim 18 that was a revision of application claim 1. Application claim 18 read as follows, with deletions from application claim 1 shown in brackets and new language shown in italics:

Claim *18*. Method for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurality of appliances *of different categories and different manufacturers,* each *appliance being* responsive to a different signal structure, comprising the steps of:

*generating a selectedcategory signal signifying the category of said selected one of said plurality of appliances under user control;*

setting said selected appliance to execute a[n] [observable] *predetermined* action upon receipt of a response-evoking command signal having said required signal structure;

[upon user activation,] transmitting in sequence a plurality of response command signals each *commanding said predetermined action in* [having] a different signal structure, until said selected appliance executes said [observable] *predetermined* action; *whereby the last-transmitted one of said response command signals constitutes said response-evoking signal having said required signal structure;*

storing signal structure identification data corresponding to said required signal structure of said response-evoking [command] *signal,* thereby creating stored [product] *signal structure* identification data; and

generatingsubsequent [user activated] *appliance* command[s] [with a signal structure associated with] *signals at least in* *990 *part under control of said selected category signal and* said stored signal structure identification data.

In filing the amendment, Rich distinguished the Rosenhagen patent, which she argued was directed to a remote control dedicated to the operation of one device, a toy car. She wrote:

The main idea of the Rosenhagen patent is to prevent interference between a remote control unit associated with one car and that associated with another. Thus each toy vehicle matches an incoming command burst with a standard which includes the identity code. Signals from other remote control units are rejected.

On the other hand, according to the present invention, one remote control unit is to operate a plurality of appliances, both of different manufacturers and in different categories.

Rich also brought to the attention of the examiner a German patent, DE 3313-493 to Telefunken (the "Telefunken patent"). The remote control described in the Telefunken patent is directed to a single class of appliances, such as televisions or VCRs. When the user puts the remote control in the learn mode and points it at an appliance, such as a television, and presses a button, such as channel up, the remote control unit steps through its memory or library of codes, until the appliance responds. With the television it would respond by advancing up a channel. The Telefunken unit then continues through its library of codes, building a subset of similar codes that would produce that observable action. The user then repeats the process using a different command button, such as volume down. The remote control unit then reviews the subset of codes until it arrives at a code that produces this second observable action; in this case the volume would go down. At this point, the unit moves through the initial subset of codes that produced the first action and collects from that subset a further subset of codes that produce both the first and second observable actions (both advance a channel up and turn the volume down). The user would repeat this process until the unit identifies the unique sequence of codes to operate that appliance. The unit would then be like a dedicated remote for that appliance.

In the Amendment she filed with the Patent and Trademark Office ("PTO"), Rich wrote:

German Patent DE 3313-493 teaches a remote control unit to control appliances, specifically consumer electronics devices, of different manufactures but of *one and the same category*. (Claim 1, line 3.)

....

New claim 18 is the first method claim now on record. It distinguishes from German Patent DE 3313-493 in a number of important respects. The selected appliance is said to be one of a plurality of appliances of different categories as well as different manufacturers. The selected appliance is set to execute a predetermined action upon receipt of the response-evoking signal. In the DE 3313-493 patent the selected appliance does not have to be set to execute a predetermined action. Any one of the controllable actions will suffice. The German device, since it is only for different manufacturers and not for different categories, allows the trial and error signals (response command signals) to be available for every possible command. No matter which command in selected by the user, the German device will generate this command in the code of all the manufacturers covered by the remote control unit. It is already an inventive step to consider that it is not essential that this capability be available. The difficulty in setting the device to be receptive to the particular command is minimal. In many cases, simply turning on the power is sufficient.

There is nothing in the German device which allows the selection of a category signal, since all the control devices in the German patent are of the same category. Finally, there is no generation of subsequent appliance command signals under control at least in part of a selected category signal. There in no such signal generated in the German device. (Emphasis in original)

5. *1987: Philips's* '359 Patent *Issued*

The examiner allowed the amended claims, renumbering them so that amended claim 18 became claim 1. On October 27, 1987, the '359 patent was issued to a Philips affiliate, NAP Consumer Electronics Corp., as assignee of Rumbolt, McIntyre, and Goodson. NAP subsequently assigned the patent to North American Philips, which has since changed its name to Philips Electronics North America Corporation.

The patent is titled "Universal Remote Control Unit with Model Identification Capability." In the paragraphs titled "Summary of Invention" the objectives of the patent are identified as follows:

1. to furnish a universal remote that can control different types (categories) of appliances made by different manufacturers;

2. the remote is to be simple to operate, light, reliable, and relatively inexpensive;

3. the remote must identify a command signal structure with minimal effort on the user's part and in a short time; and

4. the identified signal structure is to be retained until the "identify" mode is reinitiated.

The Summary describes the following as the desired performance:

1. setting an appliance to execute some "observable" action when receiving a "response-evoking signal;"

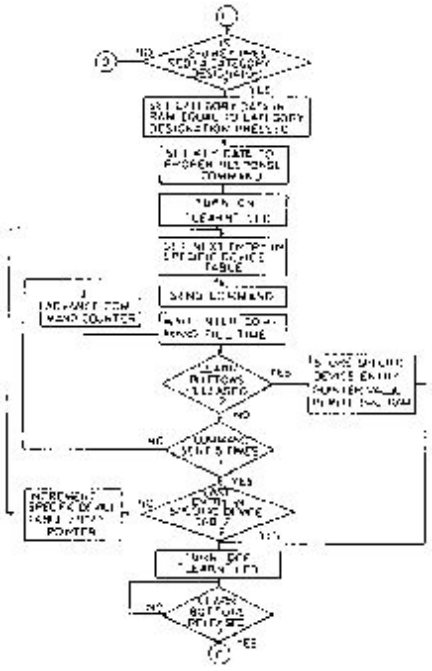
2. activating a "selector" (could be keyboard) to put the remote in an "identify" (e.g., learn) mode;

3. executing an "identify" (e.g. learn) program during which the remote sends "response command" signals in a variety of signal structures until the appliance responds with the "observable action;"

4. in response to the "observable action," terminating transmission of the "response command" signals.

In a preferred embodiment described in the patent, the remote control has a memory that contains a library of command signals. Those signals can be sent in different signal languages. The user first pushes a button on the remote control to select the type of appliance to be operated, such as a television. The user then presses another button that causes an infrared beam to be sent. That beam contains one of the command signals, such as "channel up," from one of the language groups. If the TV responds to that signal, the user releases the buttons, and the remote is set to operate using commands from the language group to which that signal belongs. If the TV does not respond to the first signal and the user continues to hold the buttons down, the same command is sent in the language of the next group. This cycle continues until the TV responds and the user, recognizing that response, releases the buttons to set the remote control unit. If the control unit cycles through all of its language groups without evoking a response, it indicates to the unit that it could not identify the appliance.

The following is Figure 5, a flow chart for the identify program of the preferred embodiment, in which the diamonds in the chart indicate a decision block controlled by the user and the rectangles indicate an action block controlled by the microprocessor.



The court will refer to the process outlined by the flow chart as the "search and set" method of programming the remote control.

The two claims of the patent in issue in this case read as follows:

1. Method for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurality of appliances of different categories and different manufacturers, each appliance being responsive to a different signal structure, comprising the steps of:

generating a selected category signal signifying the category of said selected one of said plurality of appliance under user control;

setting said selected appliance to execute a predetermined action upon receipt of a response-evoking signal having said required signal structure;

transmitting in sequence a plurality of response command signals each commanding said predetermined action in a different signal structure until said selected appliance executes said predetermined action, whereby the last-transmitted one of said response command signals constitutes said response-evoking signal having said required signal structure;

storing signal structure identification data corresponding to said required signal structure of said response-evoking signal, thereby creating stored signal structure identification data; and

generating subsequent appliance command signals at least in part under control of said selected category signal and said stored signal structure identification data.

6. Apparatus for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurali[t]y of appliances each responsive to a different signal structure, said selected appliance being set to execute a predetermined action up[ ]on receipt of a response-evoking signal having said required signal structure, comprising

means for transmitting, in sequence a plurality of response command signals each having a signal structure different from the others of said response command signals, until said appliance executes said observable action in response to said response-evoking signal;

means for storing signal structure identification data corresponding to said response-evoking signal;

means for generating subsequent appliance command signals at least in part in dependence [sic] on said stored signal structure identification data;

wherein each of said appliances belongs in one of a multiplicity of categories;

further comprising second user operable selector means for generating a selected category signal signifying a selected one of of [sic] said categories; and

where in [sic] said subsequent appliance command signal generating means further operates at least in part in dependence [sic] upon said selected category signal.

**B.** ***UEI's ONE FOR ALL Remote Control***

Paul Darbee and Avram Grossman started Universal Electronics ("UEI") in 1985 as a business to develop and market a multi-brand remote control. They explored a number of alternatives for a multi-brand remote and analyzed products on the market, including a Philips remote with the search and set method of selecting a code. Richard Ellis, UEI's software architect and designer testified that UEI obtained a Philips universal remote, analyzed it, and used it as a template for UEI's search method.

UEI settled on a plan to develop a remote a transmitter that had a library of signal structures. Each set of signals in the library would be assigned a three or four digit code and the user would enter a code into the transmitter to set it to control a particular manufacturer's appliance. As a back-up to this direct entry method, they designed their transmitter to allow a search and set method, whereby if a customer did not have a code for direct entry, he or she could search the library of codes by pushing a button on the remote control. The remote would then automatically transmit a sequence of commands to the electronic appliance to be controlled, such as transmitting to a television the sequence of codes for channel up. Once the targeted device responded, the user set the remote to use that set of signals to control the appliance.

On October 14, 1987, UEI filed an application to patent its multi-brand remote. Philips '359 patent was issued 13 days later, on October 27. At that point, UEI had not sold any multi brand remotes with its search and set feature.

After obtaining and reviewing a copy of the '359 patent, Darbee and Ellis decided to abandon their search and set method. As an alternative, they developed a new back up method they called "step and set." Under the search and set method, the consumer pushed a designated button, and the transmitter automatically searched the memory or library of codes and transmitted a predesignated sequence of codes. Under their new "step and set" method, the consumer needed to push a button each time he or she wanted to test one of the code sequences in the library. With each test, he or she would need to push another button to designate a response that would indicate whether the sequence would operate the appliance. If it did not, the user would

then push the button again to "step" down the library of codes to test another code to see if it controlled the appliance.

Thus, for example, for a television, under UEI's old search and set method, the remote would automatically search through its library of signal codes and for each set of codes would transmit the signal for a designated response, such as the signal for channel up, until the television responded. The consumer would then set the remote to transmit that set of signals for that television. Under UEI's new step and set method, the unit did not automatically search through its library of codes. Rather, the consumer would push a button to step the remote to a new set of signal codes in the library, and then the consumer would push a second button, such as channel up or channel down, to test for a response. If the television did not respond, the user would push the button to "step" to the next set of codes in the library and would again push a button to test for a response. When the television responded, the consumer would set the remote to transmit that set of signals.

UEI sells a number of different models of its universal remote control. While the user may press different buttons on the models to enter the search mode, the models are substantially the same and each model includes a step and set method for identifying appliances.

**C.** ***Philips Puts UEI on Notice of Its Infringement Claim***

UEI introduced its multi-brand remote control with the step and set feature in early 1988 and marketed it under the name "UNIWAND" or "ONE FOR ALL." Philips first learned of UEI's multi brand remote at a June, 1988 Consumer Electronics Show in Chicago.

By a letter dated October 21, 1988, Marianne Rich wrote to UEI contending, among other things, that the UNIWAND infringed Philips '359 patent. UEI's patent counsel, Thomas Vigil, responded to Rich by a letter dated November 4, 1988, denying infringement based in part on UEI's step and set method. In his letter, Vigil reported UEI expected the search and set method would be a desirable alternative way of setting its remote and suggested Philips consider granting UEI a license under the '359 patent.

In January of 1989, Rich responded by reporting that she did not have a UNIWAND, but that it appeared UEI's remote infringed the claims of the '359 patent in that in using step and set UEI had simply added an additional step to the patented invention. She suggested Philips would consider granting UEI a license at a rate of 5 percent of UEI's net selling price. In April she wrote to Vigil again inviting him to join in concrete negotiations. Vigil responded in May of 1989 and forwarded to Rich a sample of the ONE FOR ALL remote.

Ms. Rich left Philips Electronics in 1989. In 1989, UEI's gross sales had increased to approximately $1,000,000. In 1990, gross sales were approximately $10,000,000.

The next communication UEI received from Phillips on the subject of the '359 patent was a March 26, 1991 letter from Edward Goodman, a Phillips attorney, addressed to the President of UEI. In the letter, Goodmanreported that UEI's ONE FOR ALL III infringed Philips's '359 patent. He reported Philips was prepared to grant UEI a license. Vigil responded to Goodman's letter by calling him and reviewing with him UEI's prior communications with Rich. Thereafter, in a series of telephone calls and by a letter dated April 15, 1991, Goodman renewed Philips's offer of a license.

On June 27, 1991, Vigil wrote to Goodman and restated UEI's position that it was not infringing the '359 patent. Vigil also reported to Goodman that UEI had significantly changed its position during the 22 months between the time Vigil had written to Rich in May of 1989 and Goodman had renewed Philips's infringement claim in March of 1991. Vigil noted that should Philips continue to assert infringement, UEI

would argue Philips delay would provide a basis for a defense and a basis for a claim for damages. Vigil suggested Philips should consider a cross license of various patents.

Goodman wrote to Vigil on July 8, 1991. Apparently he had not received Vigil's June 27 letter by then, as he reported that he had not receive a response to his April 15 letter. It is not clear whether Vigil responded to Goodman's July 8, 1991 letter. In 1991, UEI's gross sales increased from $10,000,000 a year to $22,500,000.

Goodman wrote to Vigil again in March of 1992 and again suggested the parties meet. Goodman, Vigil, and others, including Robert Browne, another of UEI's attorneys, met in June of 1992. Goodman again proposed UEI take a license under the '359 patent. UEI rejected Goodman's offer.

Browne followed up on the meeting with July 28 and August 14, 1992 letters to Goodman. That year UEI introduced its "EASY" line of remotes. In December of that year, *Consumer Reports* named the "BIG EASY" the best device for television watching. UEI's sales for that year increased from $22,500,000 to $50,000,000.

In February of 1993, UEI conducted an initial public stock offering, and that year *Business Week* ranked UEI as the seventh fastest-growing company in the United States. Goodman next communicated with UEI by an April 30, 1993 letter to Browne in which he suggested another meeting. Browne replied by reporting again that UEI denied infringement.

Philips approached UEI again in April of 1994 and the parties met in June in a further effort to reach an agreement. When they could not agree, Philips filed this lawsuit in July of 1994. By then, UEI's annual sales were in the range of $100,000,000 a year.

**D. *The Pleadings and Trial Testimony***

In its complaint, Philips alleges that by manufacturing and selling the "ONE FOR ALL," UEI is infringing and inducing others to infringe the claims of the '359 patent. It seeks an order enjoining UEI from continuing that alleged infringement and as damages seeks a judgment for an amount calculated based on a reasonable royalty for the infringing sales.

UEI answered the complaint by denying infringement. It asserted laches and estoppel as affirmative defenses, contending Philips claims for relief should be barred by its delay in filing this action. It also prayed for a declaratory judgment that claims 1 and 6 were invalid as obvious, as failing to disclose a best mode, and as having been in public use more than one year prior to the date of the application.

At the trial, Philips called Edmund H. Smith, Jr. to testify. Smith is an electrical engineer and a consultant in the field of optical electronics. He reviewed the prior art in the field, including the Welles, Harger, and Telefunken patents. He testified to the nature of the invention described in '359 patent and to the preferred embodiment described in the specifications. He testified that the flow diagrams in the patent described the preferred embodiment of the invention.

Smith reviewed UEI's devices and offered his opinions that they satisfied each of the limitations in claims 1 and 6 of the patent and, in addition, that they perform substantially the same functions as the method and apparatus in claims 1 and 6 of the Philips patent in substantially the same way to obtain substantially the same result.

Philips called Harry F. Manbeck, Jr. to testify to testify on the measure of damages. Manbeck worked as a patent lawyer at General Electric from 1955 to 1990 and during that time was involved in licensing patents

and technology. He left General Electric in 1990 to become Commissioner of Patents and Trademarks. Manbeck offered his opinion that a reasonable royalty in this case would be for UEI to pay to Philips 50% of UEI's net profits. With interest through June of 1995 that came to approximately $24,222,177 (a number that may reflect more optimism than precision).

UEI called Alex M. Cook, Jr. to testify. Cook is an electrical engineer. He is the Manager of Project Engineering for Scientific Atlanta, a cable television business. Among other things, he is responsible for the development of remote controls built by Scientific Atlanta. Cook testified that a person of ordinary skill in the field of remote control design needed to have working knowledge in three areas: hardware design of microprocessors, software for microprocessors, and remote control user interface, meaning how an individual programs and uses a remote control device.

Cook testified UEI's step and set method does not include two elements that Claim 1 requires: 1) UEI's products do not require the device to be set up to execute a predetermined action; and 2) they do not transmit the plurality of response commands in sequence. Cook also testified that, in light of the Telefunken patent, the invention of the '359 patent would have been obvious to one of ordinary skill in the art in 1984 or 1985.

UEI called Ronald G. Vollmar to testify on damages. Vollmar is an accountant and partner with Price Waterhouse. He offered his opinion that a reasonable royalty would be 1/2 of 1 percent of UEI's net profits.

## I. *DISCUSSION*

### A. *Basis for Jurisdiction*

The court has jurisdiction to hear and resolve plaintiff's claim of patent infringement pursuant to 28 U.S.C. s. 1338(a) and to hear and resolve defendant's counterclaims pursuant to 28 U.S.C. s.s. 1338(a) and 2201 et seq.

As both plaintiff and defendant are incorporated in Delaware, venue properly lies within this judicial district under 28 U.S.C. s.s. 1391(b) and (c).

### B. *Is Universal Electronics, Inc. Infringing* the '359 Patent *by Manufacturing and Selling Remote Controls that use the Step and Set Method?*

Philips contends UEI is infringing claims 1 and 6 of the '359 patent by manufacturing and selling remote controls that use the step and set method. It offers the following element by element comparison of the claims and the UEI step and set method:

| **CLAIM 1:** | **Elements of UEI's remote controls** |
|---|---|
| a. Method for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurality of appliance of different categories and different manufacturers, each appliance being responsive to a different signal structure, comprising the steps of: | UEI's "step and set" search method is a method for adapting a remote control to generate command signals in a required format for an appliance which is selected from appliances of different categories made by different manufacturers. |
| b. generating a selected category signal signifying the category of said selected one of said plurality | The user must press a button indicating the type of appliance to be controlled, thereby generating a signal |

| | | |
|---|---|---|
| | of appliance under user control; | signifying that category. |
| c. | setting said selected appliance to execute a predetermined action upon receipt of a response-evoking signal having said required signal structure; | The user must set the appliance to be controlled to execute a predetermined response. For example, if the user is attempting to set up the remote control to operate a television using "power off," the user must turn on the television. |
| d. | transmitting in sequence a plurality of response command signals each commanding said predetermined action in a different signal structure until said selected appliance executes said predetermined action, whereby the last-transmitted one of said response-evoking signal having said required signal structure; | The user sends out a command signal by pressing a search key and a function key. By alternating between these two buttons, the user transmits a plurality of response command signals in sequence in different signal structures until the appliance to be controlled executes a predetermined action. The response command signal which evoked that response has the required signal structure. |
| e. | storing signal structure identification data corresponding to said required signal structure of said response-evoking signal, thereby creating stored signal structure identification data; and | Once the user observes the appliance execute a predetermined action, the user presses a button to store data identifying the command signal structure that evoked that action. |
| f. | generating subsequent appliance command signals at least in part under control of said selected category signal and said stored signal structure identification data. | When the correct signal structure for operating an appliance has been identified and data identifying that signal structure has been stored, all subsequent remote control commands generated to operate that appliance will be generated at least in part under control of the stored data and the category signal used to operate that appliance. |

**CLAIM 6:**

| | | |
|---|---|---|
| a. | Apparatus for adapting a remote control unit to generate appliance command signals having a required signal structure for controlling a selected one of a plurality [sic] of appliances each responsive to a different signal structure, | UEI remotes which perform the "step and set" search method contain an apparatus for adapting a remote control to generate command signals in a required structure for an appliance which is selected from appliances of different categories made by different manufacturers. |
| b. | said selected appliance being set to execute a predetermined action up[ ]on receipt of a response-evoking signal having said required signal structure, comprising | The user must set the appliance to be controlled to execute a predetermined response. For example, if the user is attempting to set up the remote control to operate a television using "power off," the user must turn on the television. |
| c. | means for transmitting, in sequence a plurality of response command signals each having a signal structure different from the others of said response command signals, until said appliance executes said observable action in response to said response-evoking signal; | UEI remotes which perform the "step and set" method allow a user to send out a command signal by pressing a search key and a function key. By alternating between these two buttons, the user transmits a plurality of response command signals until the appliance to be controlled executes an observable action. |

| | | |
|---|---|---|
| d. | means for storing signal structure identification data corresponding to said response-evoking signal; | The UEI remotes contain a memory to store data identifying the command signal that evoked the predetermined action. |
| e. | means for generating subsequent appliance command signals at least in part in dependence [sic] on said stored signal structure identification data; | The UEI remotes have circuitry which can generate subsequent commands at least in part in dependence on the stored signal structure identification data. |
| f. | wherein each of said appliances belongs in one of a multiplicity of categories; | The UEI remotes can control appliances belonging to more than one category of appliances. |
| g. | further comprising second user operable selector means for generating a selected category signal signifying a selected one of of [sic] said categories; and | The UEI remotes have buttons for the user to select the type of appliance to be controlled, and each such button, when pressed, generates a signal signifying the category selected. |
| h. | where in [sic] said subsequent appliance command signal generating means further operates at least in part in dependence upon said selected category signal. | The UEI remotes have circuitry which can generate subsequent commands at least in part in dependence on the category signal selected by the user. |

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### 1. *Literal Infringement*

[1] [2] [3] [4] The court follows a two-step process in resolving Philips's contention that UEI is infringing claims 1 and 6 of the '359 patent. First, the court must construe the claims at issue. Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). Claim language should normally be interpreted as it would be by one reasonably skilled in the art. Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 867 (Fed.Cir.1989). Typically, this will require the court to read the words of a claim as if the inventor intended them to express their ordinary meaning. An inventor may, however, invest certain claim language with a unique definition. In either case, to determine the meaning of the words an inventor has used in a claim, the court may also consider other words in the claim, other claims in the patent, the specification, the prosecution history, and expert testimony and other extrinsic evidence. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979-81 (Fed.Cir.1995), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996); Elf Atochem v. Libbey-Owens-Ford Co., 894 F.Supp. 844, 859 (D.Del.1995).

[5] [6] Second, once the court determines the scope and meaning of the claims, it must determine whether the accused method or apparatus infringes them. Palumbo v. Don-Joy Co., 762 F.2d 969, 974 (Fed.Cir.1985). That is, the court must determine whether the properly construed claims read on the accused product. If the accused device contains all of the limitations of the claims, literal infringement is present. Read Corp. v. Portec, Inc., 970 F.2d 816, 821 (Fed.Cir.1992).

UEI rests its infringement defense on two limitations in the claim language. First, UEI contends its units do not command the execution of a "predetermined action." Second, it contends its units do not "transmit in sequence a plurality of response command signals."

#### a. *Do UEI's remote control devices execute a "predetermined action?"*

[7] UEI contends the words "predetermined action" in claims 1 and 6 can be read with their ordinary meaning and describe a single, specific, user-observable response by the appliance (such as channel up for a television) that has been previously determined at the time of manufacture and that the user is not free to define. In support of this construction, UEI notes, for example, that the specification at column 5, line 51, sets out the following description of the flow chart for a preferred embodiment of the program that is set out in Figure 5: "Next, the key data section of RAM 44 is automatically set to the predetermined response command. This command is a command which will cause some readily observable action to occur at the appliance to be controlled. For TV, VCR, and cable converter, the channel up command is used."

In addition, UEI notes the inventors use "predetermined" in other claims in a way that suggests it means determined by the manufacturer rather than by the user. For example, in claim 4 "predetermined" describes an intercommand time delay determined at the time of manufacture. In claim 3 "predetermined" describes the number of times a command signal will be sent before the command for the next appliance will be sent.

UEI also contends its reading of these words is consistent with how Rich used them in her Response to the Patent Office examiner's December 12, 1986 Office Action, where she wrote:

New claim 18 is the first method claim now on record. It distinguishes from German Patent DE 3313-493 in a number of important respects. The selected appliance is said to be one of a plurality of appliances of different categories an well as different manufacturers. The selected appliance is set to execute a *predetermined action* upon receipt of the response-evoking signal. In the DE 3313-493 patent the selected appliance does not have to be set to execute a predetermined action. Any one of the controllable actions will suffice. The German device, since it is only for different manufacturers and not for different categories, allows the trial and error signals (response command signals) to be available for every possible command. No matter which command in selected by the user, the German device will generate this command in the code of all the manufacturers covered by the remote control unit. It is already an inventive step to consider that it is not essential that this capability be available. The difficulty in setting the device to be receptive to the particular command is minimal. In many cases, simply turning on the power is sufficient.

UEI argues Rich's statement is an admission that claim 1 identified a remote control device that is preprogrammed to send a particular response-evoking signal.

In response, Philips concedes that the specification's description of a preferred embodiment does provide that the response-evoking signal is predetermined by the manufacturer. Philips argues, however, that the preferred embodiment is simply one way of implementing the broad language of claim 1 and that the words "predetermined action" in claim 1 can be read as including actions determined by the user at the time he or she is stepping through the library of codes to elicit a response from the appliance.

Philips argues Rich's statement to the Patent Office spoke to the difference between the claimed invention of a remote device directed to more than one appliance and Telefunken's remote, which was dedicated to only one device. As a Telefunken remote for a television would not, for example, have buttons for a VCR such as pause or rewind, Rich was pointing out that a user of a Telefunken remote would not need to select a button from among a number of buttons to "predetermine" those that would apply to a television. For a Philips remote, he or she would first need to "predetermine" those buttons that applied to a television or VCR, before using that button to test for a response.

As used in the claims, the word "predetermined" can be read to express its ordinary meaning: to determine before hand. While Philips contends "before hand" may only mean that the user selects the response-evoking signal before he or she presses the action button, a more logical reading of the claim suggests that what happens before hand is that the manufacturer programs the device to use one action to test the signal

structure. This is what the inventors described in the preferred embodiment, by noting that for a television the unit would be preprogrammed to send the signal for channel up. That is consistent with one of the objectives the inventors listed in the summary of invention, to make the unit simple to operate. By programming the response evoking signal, the inventors have reduced the number of buttons to be pushed by the user, eliminated the need for the user to make a choice as to what signal to send, and have, therefore, simplified the operation of the unit. Rich's comments to the examiner support and are consistent with this construction. As used in claims 1 and 6, the phrase "predetermined action" is construed to mean an action that is determined by the manufacturer.

As UEI has designed its remote control units to have the user determine the response-evoking signal, their remote control devices do not infringe this element of the claims.

**b.** ***Do UEI's remote control devices transmit "in sequence a plurality of response command signals?"***

[8] UEI contends the phrase "transmit in sequence a plurality of response command signals" in claims 1 and 6 should be read to mean that the remote control device, without any intervening action on the part of the user, must be capable of transmitting more than one response command signal in response to a single key press. In support of this claim construction, Cook testified that this language describes an action in which the process is initiated by the user. The device on that action transmits in sequence a plurality of signals; that is, the device transmits a series or a large number of response command signals. He testified that the flow chart in Figure 5 shows this, as it describes a process whereby the user presses a learn button and then presses a category button. The unit then automatically continues to send command signals until the user releases the learn button.

Philips responds by again arguing that the flow chart in Figure 5 is simply a preferred embodiment and that nothing in the words of the claim requires that the signals be sent continuously without any user intervention. Philips contends that while the language of the claim is satisfied if the user holds down a button to send consecutive signals, it is also satisfied if the user presses two buttons alternatively, causing consecutive signals to be sent (as UEI's devices do).

In support of this proposed construction, that claims 1 and 6 do not claim a device that automatically scrolls through the library of codes, Philips notes that it has a separate claim that does claim an automatic search through the library of codes. Claim 9 reads:

9. Apparatus as set forth in claim 8, wherein said first user operable selector means *comprises a keyboard having an 'identify' key:* and

wherein said first user operable selector means generates said "identify" command *during depression of said identify key* and a "terminate" command terminating said transmission of said plurality of response command signals *upon release of said identify key*. (emphasis supplied)

Claim 9's specific identification of a device that automatically scrolls through a library of codes does suggest Philips's proposed construction is correct. Therefore, the words "transmitting in sequence a plurality of response command signals" in claims 1 and 6 should not be construed to provide for an automatic transmitting of a plurality of response command signals. Rather, these words are broad enough to include a user transmitting in sequence one at a time a plurality of response command signals, as the user does in UEI's step and set method.

In summary, Philips is correct that UEI's remote control devices infringe those elements of claims 1 and 6 that provide for transmitting in sequence a plurality of response command signals. UEI's devices do not, however, execute a predetermined action as described in the claims. As UEI's devices do not contain all of

the limitations of claim 1 and 6, they do not literally infringe the claims of the patent.

### 2. *Infringement Under the Doctrine of Equivalents*

[9] Philips contends that the differences between the claims of the '359 patent and UEI's step and set method are insubstantial and that the court should find UEI infringes under the doctrine of equivalents. As the Supreme Court observed in Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950), limiting enforcement of exclusive patent rights to literal infringement would place the inventor at the mercy of verbalism and would be subordinating substance to form and might encourage potential infringers to make unimportant and insubstantial changes and substitutions in a patent that would be enough to evade the reach of the law.

[10] As the Federal Circuit recently noted in Hilton Davis Chemical Co. v. Warner-Jenkinson Company, Inc., 62 F.3d 1512 (Fed.Cir.1995), substantiality of differences under the doctrine of equivalents frequently can be tested by looking to whether the claimed and accused methods and products perform substantially the same function in substantially the same way to obtain the same result. Id. at 1517. Other evidence relevant to this inquiry may include whether one skilled in the art would have known of the interchangability of an ingredient, element, or step and would have considered the change insubstantial, whether the alleged infringer copied the claim in a way that may suggest insubstantial changes, whether the infringer attempted to design around the claims, and whether the alleged infringer developed its product or process through independent research. Id. at 1518-20.

We have evidence relating to a number of these factors in this case. First, there is some evidence of copying. In the initial stages of developing its device, UEI did obtain and study a Philips unit. That was before Philips had obtained its patent, and it apparently was before UEI settled on the direct entry method as its primary method for setting codes.

Second, there is some evidence that UEI attempted to design around the patent. As UEI was preparing to bring its product to market, its principals were monitoring developments at the patent office. On learning that Philips had obtained the '359 patent, and after reviewing the patent, they abandoned the search and set method and developed the step and set method as an alternative.

Third, those skilled in the art of remote control design and development at the time the patent issued would no doubt have concluded that step and set was a step backwards from what was a common goal of those in the industry of developing a simple, easy to use universal remote control device. With direct entry, UEI had a method where the user opened the manual, identified the code for an appliance, and pressed 3 or 4 buttons on the universal remote to set it to operate the device. With Philips's device (at least for the preferred embodiment) the user pressed two buttons and held one down until the appliance responded. With UEI's step and set, the user needs to push a button to start the process, push a button to identify the nature of the appliance, and then alternately push two buttons to step through the codes. As Cook testified, this could take 50, 60, or more entries before the user identifies the code.

These facts suggest that while UEI had studied Philips's remote, it had independently developed its direct entry method. The facts also suggest that UEI intended to design around Philips patent and, because they were only looking for a method to back up direct entry, they would accept a method that would be more difficult and cumbersome for the user.

These facts also suggest the differences implemented by UEI are substantial, or at least they resulted in a method that is substantially different than the preferred embodiment in the Philips patent, and substantially different from a device that is programmed with a predetermined command and would automatically scroll through the library of codes. It is not so clear the differences are substantial, however,if we limit the change

UEI implemented to abandoning the predetermination of the response-evoking signal.

UEI notes that Rich had relied on the significance of the predetermined action in arguing to the examiner that the invention of the '359 patent was not rendered obvious by the Telefunken patent. It argues Philips should be estopped from now arguing that the predetermined action is an insubstantial element of the claims and that on deleting it UEI would nevertheless infringe under the doctrine of equivalents.

[11] Under the doctrine of prosecution history estoppel, a patentee is not allowed to recapture as an infringement what he gave up during prosecution in order to overcome the prior art and obtain allowances of the claim. Loctite Corp., 781 F.2d at 870. It is not clear the doctrine should apply in this case.

Rich could have made a number of arguments to the patent office to distinguish the Telefunken patent from the claimed invention. Telefunken was directed to only one category of devices. Its search method called for the user to push any one of a number of buttons to get a response. Once it identified a code that obtained a response, it had to cycle through the codes to test each function.

She made three arguments. First, she argued that Telefunken taught a remote control directed to only one category of devices, whereas the claimed invention taught a remote control directed to multiple categories of devices. ("German Patent DE 3313-493 teaches a remote control unit to control appliances, specifically consumer electronics devices, of different manufactures but of *one and the same category*." (emphasis in original)). Second, she reported that Telefunken allowed for trial and error on each function, whereas the claimed invention predesignated the function to show a response. ("No matter which command is selected by the user, the German device will generate this command in the code of all the manufacturers covered by the remote control unit. It is already an inventive step to consider that it is not essential that this capability be available. The difficulty in setting the device to be receptive to the particular command is minimal.") The third argument she made, that "there is no generation of subsequent appliance command signals under control at least in part of a selected category signal," does not appear relevant to this case.

Showing that the Telefunken patent was directed to one category of devices may have been sufficient to distinguish it from the invention of the '359 patent. It is not clear Rich was giving anything up by arguing that Telefunken did not provide for a predetermined response. Certainly, it does not appear to be a material difference between the two devices. It would be difficult to find, therefore, that her statement should estop Philips from arguing that a device is equivalent if its response evoking command is not predetermined in the factory.

While Rich's statement should not estop Philips from obtaining that relief, it is relevant for the purposes of defining what changes in the method identified in the claims may be substantial. Rich's comment on the significance of the predetermined command is echoed in the summary of the invention: "The remote control unit is to be simple to operate...." Rich could have told the examiner that whereas the device claimed in the patent is more useful and performs more complicated functions, it has a simpler method of operation and is easier to use. The predetermined response command is one element of that ease of operation.

In redesigning its unit away from an automatic search and a predetermined action, UEI was not only seeking to avoid infringement, it was moving away from the one of the objects of Philips's invention, simple operation and ease of use. Philips has shown with claim 9 and its claiming an automatic sequencing through the codes, that claims 1 and 6 can be read more broadly to include the step and set method. That is, while the object of the invention and certain claims may have been directed to a simple and easy to use remote, claims 1 and 6 were written broadly enough to cover UEI's method that is almost intentionally difficult and hard to use.

Philips has not, however, identified a parallel situation for the limitation calling for a predetermined

response-evoking command. That is, Philips had not claimed a simpler device in which the manufacturer predetermined the response-evoking action, and a more complicated device where the user would determine the action. Philips's claims 1 and 6 include limitations for a response command signal for a predetermined action. Rich correctly reported to the examiner that this was an inventive step.

While intent is not an element of infringement, it appears that in attempting to design around Philips's invention UEI correctly identified significant limitations in the claims that were an important aspect of the invention. By moving to a method that did not include a predetermined response evoking signal, UEI moved to a method that is substantially different from the method in the claims. For these reasons, the court finds Philips has failed to establish infringement under the doctrine of equivalents.

### 3. *UEI's Affirmative Defenses*

As Philips has failed to carry its burden on its claims for relief, and UEI is entitled to a judgment in its favor on the infringement claims, the court need not reach the issues raised by UEI's affirmative defenses.

### 4. *UEI's Counterclaim that* the '359 Patent *is Invalid*

UEI has counterclaimed for a judgment that claims 1 and 6 of the '359 patent are invalid under 35 U.S.C. s. 103 as obvious, invalid under 35 U.S.C. s. 102(b) as having been publicly used over one year prior to the date Philips filed the patent application, and as invalid under 35 U.S.C. s. 112 for failure to disclose the best mode. To prevail on any of these claims, UEI must establish the basis for invalidity by clear and convincing evidence. American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1358-60 (Fed.Cir.1984). For the following reasons the court will deny each of these claims for relief.

UEI has argued that if the court adopts Philips's proposed construction of the disputed terms in claims 1 and 6 of the '359 patent, the claims would have been obvious to a person of ordinary skill in the art at the time of the invention and UEI is entitled to a judgment that the claims are invalid under 35 U.S.C. s. 103. FN1 As the court has not adopted Philips's proposed claim construction for "predetermined action" and as UEI has not argued it is otherwise entitled to relief finding claims 1 and 6 invalid as obvious, the court will enter an order directing the clerk to enter judgment in favor of Philips on this claim for relief.

FN1. Section 103 of the Patent Act provides in relevant part:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in Section 102 of this title, if the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made *to a person having ordinary skill in the art to which said subject matter pertains*....

35 U.S.C. s. 103 (emphasis added).
[12] UEI contends Philips's marketing research on its universal remote in the summer of 1984 was a public use of the invention claimed in the '359 patent and that because Philips did not file its patent application until November of 1985, the patent is invalid under 35 U.S.C. s. 102(b) as having been in public use more than one year prior the date of the application. FN2

FN2. Section 102(b) of the Patent Act provides in relevant part:

A person shall be entitled to a patent unless ... (b) the invention was ... in public use ... in the country more than one year prior to the date of the application for patent in the United States.

35 U.S.C. s. 102(b).
Public use within the meaning of section 102(b) is a use of the product in its natural and intended manner. In re Blaisdell, 242 F.2d 779 (C.C.P.A.1957). When the primary purpose of the use is experimental, the bar does not apply. TP Lab., Inc. v. Professional Positioners, Inc., 724 F.2d 965 (Fed.Cir.), *cert. denied,* 469 U.S. 826, 105 S.Ct. 108, 83 L.Ed.2d 51 (1984). In this case, it appears the Turtle Bay staff and the focus group participants used the prototypes in a restricted setting for the primary purpose of gathering market research information. They did not use them in their natural and intended manner, to operate appliances for the purpose of viewing or listening to the content of a particular media, such as a television program or musical recording. In addition, it appears Philips's primary purpose in doing this research was experimental. Consequently, Philips's use of prototypes of the universal remotes was not a public use under section 102(b).

[13] Finally, UEI contends claims 1 and 6 are invalid under 35 U.S.C. s. 112 for a failure to disclose the best mode.FN3 UEI concedes Philips discloses the best mode for practicing its invention in the specification of the '359 patent, but it argues Philips knew of and wrongfully failed to disclose that best mode in its initial application to the patent office. UEI has failed to cite any authority that stands for the proposition that Philips had a duty to disclose the best mode for the invention that is the subject of the '359 patent in the original application. The court is not aware of any such authority and will, therefore, enter an order directing the clerk to enter a judgment in favor of Philips on this claim.

FN3. Section 112 of the Patent Act provides in relevant part:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear and 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 same, *and shall set forth the best mode contemplated by the inventor of carrying out his invention*.

The court will issue an Order in accordance with this Opinion.

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