

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TRICKLESTAR LLC,
Petitioner,

v.

EMBERTEC PTY LTD.,
Patent Owner.

Case IPR2017-00839
Patent 9,106,099 B2

Before BARBARA A. BENOIT, LYNNE E. PETTIGREW, and
STACY B. MARGOLIES, *Administrative Patent Judges*.

MARGOLIES, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, TrickleStar LLC (“Petitioner”) challenges the patentability of claims 8 and 10–16 of U.S. Patent No. 9,106,099 B2 (Ex. 1001, “the ’099 patent”), owned by Embertec Pty Ltd. (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Petitioner has shown by a preponderance of the evidence that claims 8 and 10–16 of the ’099 patent are unpatentable.

A. Procedural History

Petitioner filed a Petition for *inter partes* review of claims 8 and 10–16 of the ’099 patent. Paper 2 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 10 (“Prelim. Resp.”). On July 10, 2017, we instituted an *inter partes* review of claims 8 and 10–16 of the ’099 patent on the following grounds¹: (1) claim 10 of the ’099 patent is unpatentable as obvious under 35 U.S.C. § 103(a)² over EP ’379³ and the ’707 patent⁴; and (2) claims 8 and 11–16 of the ’099 patent are unpatentable as obvious under

¹ We instituted on all claims and all grounds set forth in the Petition. *See* Pet. 3.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the ’099 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

³ EP 2 051 379 A1, filed Oct. 16, 2008, published Apr. 22, 2009 (Ex. 1002).

⁴ U.S. Patent No. 7,034,707, issued Apr. 25, 2006 (Ex. 1007).

35 U.S.C. § 103(a) over EP '379, the '707 patent, and EP '752.⁵ Paper 11 (“Inst. Dec.”), 33.

Subsequent to institution, Patent Owner did not file a Patent Owner Response. *See* Ex. 3003 (email stating that Patent Owner “will not be filing a Patent Owner Response”); 37 C.F.R. § 42.120(a) (providing that “[a] patent owner may file a response to the petition addressing any ground for unpatentability not already denied”). Neither party requested oral argument. *See* Paper 14 (noting that neither party requested oral argument and ordering that no oral argument take place); 37 C.F.R. § 42.70(a) (providing that “[a] party may request oral argument on an issue raised in a paper”).

B. Related Matters

The parties do not identify any related district court proceedings, but identify IPR2016-01336, in which the Board instituted *inter partes* review of claims 1–7 and 9 of the '099 patent. *See* Pet. 1; Paper 7, 1. In IPR2016-01336, we issued a Final Written Decision on December 20, 2017, determining that Petitioner demonstrated by a preponderance of the evidence that claims 1–7 and 9 of the '099 patent are unpatentable. *TrickleStar LLC v. Embertec Pty Ltd.*, Case IPR2016-01336 (“IPR2016-01336”), Paper 11 (PTAB Dec. 20, 2017).

C. The '099 Patent

The '099 patent is directed to an energy saving device that monitors the electrical power supply to electrical equipment to reduce unnecessary power consumption. Ex. 1001, [57], 1:14–18. The '099 patent explains that “[m]onitoring can have many advantages, especially in detecting abnormal

⁵ EP 1 223 752 A2, filed Nov. 30, 2001, published July 17, 2002 (Ex. 1003).

usage, faults and theft.” *Id.* at 2:60–61. For example, according to the ’099 patent, the system may detect excessive power consumption in an office due to use of a portable heater and alert supervisory personnel to the abnormal energy usage. *Id.* at 2:62–67. The patent also describes alerting a user to cessation of power consumption, such as that caused by breakdown of a refrigerator or freezer. *Id.* at 3:1–4.

Figure 1 of the ’099 patent, below, is a general representation the components of the energy saving device:

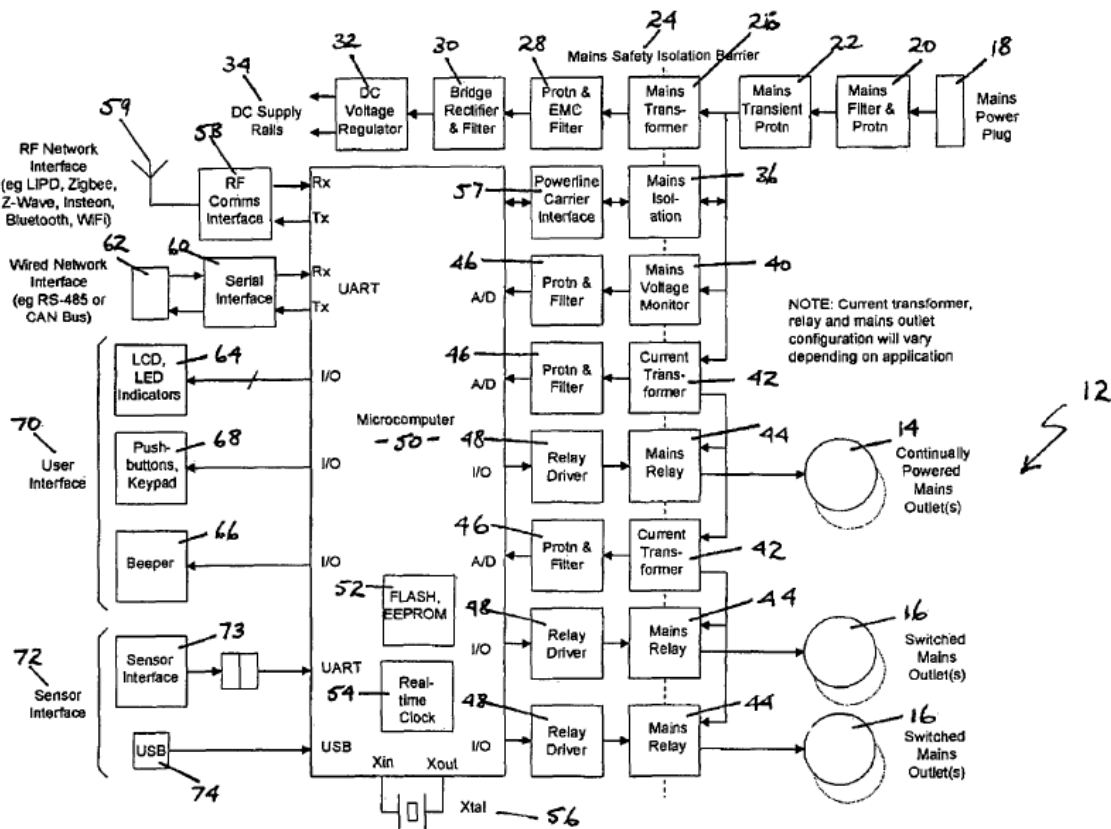


Figure 1

Id. at 5:52–54. As illustrated in Figure 1 above, energy saving device 12 includes one or more continually powered mains outlets 14 and two or more switched mains outlets 16. *Id.* at 5:58–60. According to the patent, electrical devices (not shown) are plugged into mains outlets 14 and

switched mains outlets 16 as required. *Id.* at 5:60–62. Energy saving device 12 also includes mains power plug 18 for connection to a mains power supply (not shown) and microcomputer 50, which implements energy saving algorithms and includes flash and/or EEPROM non-volatile memory 52 for storing energy saving configuration parameters. *Id.* at 5:63–64, 6:56–64.

Figure 1 above also illustrates a number of interfaces. *Id.* at 7:4–5. User interface 70 includes LCD or LED indicators 64, beeper 66, and pushbuttons and keypad 68. *Id.* at 7:20–21. According to the '099 patent, the LCD or LED indicators “output data from monitored power consumption and provide an indication of status to the use[r]” and the beeper “provide[s] an audible output to indicate faults or status change conditions, such as imminent powering down of connected mains powered equipment.” *Id.* at 7:22–24, 7:8–30.

Figure 1 further illustrates “[s]ensor interface 72 and 73,” which according to the '099 patent “provides an interface for wired connection of an external sensor module (not shown) including a remote control [infrared (IR)] sensor for IR remote control activity sensing in audio-visual applications.” *Id.* at 7:35–38. The patent states that “[t]he purpose of this is to enable automatic power reduction or power increase to electrical devices, such as in audio-visual equipment, if power can be reduced depending on user activity.” *Id.* at 7:41–44. For example, in the embodiment illustrated in Figure 3 of the '099 patent for a networked universal wall plug or general power outlet (GPO), “when the user operates the wireless transmitter via its push button or touch sensor, a wireless RF signal would be transmitted and received by wall plug 12*b*, causing it to supply mains power to the appliance.” *Id.* at 8:65–67, 9:34–40. The '099 patent also discloses that the

purported invention provides “[u]ser control to optimize energy savings function for individual outlets, e.g.[,] by setting idle power threshold levels, ‘active standby’ timeout periods, etc.” *Id.* at 14:26–28.

D. Illustrative Claims

Among the challenged claims, claims 10 and 12 are independent. Claims 8, 10, and 12, along with claim 1 from which claim 8 depends, are illustrative of the challenged claims and read as follows:

1. An energy saving device for reducing power consumption of an external electrical device, comprising:

an input connectable to an external power supply;

an output connectable to the external electrical device for selectively providing operating power thereto;

a processor for controlling when power is supplied to the external electrical device via the output; and

a sensor for monitoring wireless output signals of a remote control device that control functions of the external electrical device or another electrical device associated with the external electrical device, said sensor being coupled to the processor, and wherein the processor operates to terminate the power supplied to the external electrical device based upon the absence of the detection of the wireless output signals of the remote control device by the sensor.

8. The energy saving device of claim 1, further comprising a power sensor configured to sense power consumption of the external electrical device, the processor being further configured to determine an operational state of the external electrical device from the sensed power consumption and to terminate the power supplied to the external electrical device when the external electrical device is determined to be in a selected state.

10. An energy saving device including

an electrical plug configured for connecting to a mains power supply;

an electrical socket configured for connecting to an electrical device;

a switch configured to control electrical connection between said electrical plug and said electrical socket;

a sensor configured to wirelessly sense activity of a user-operated remote control device, the activity configured to control said electrical device;

a control module configured to monitor the sensor to determine a first length of time during which said activity has not been detected and to operate said switch to disconnect electrical connection between the electrical plug and the electrical socket when said first length of time exceeds a threshold value to prevent the electrical device from drawing power during at least some times when no user is present and using the electrical device.

12. A system for monitoring power consumption of and controlling power supply to a plurality of electrical devices, the system including:

communication apparatus for communicating with an energy saving device, the energy saving device having:

a single electrical inlet configured to connect to a mains supply electrical outlet; and

a plurality of controlled electrical outlets for selectively supplying electrical power to the electrical devices; and

a power sensor for monitoring power consumption of at least one of the electrical devices connected to the controlled electrical outlets;

a processor configured to control the connection of electrical supply from the mains supply electrical outlet to each of the controlled electrical outlets in response to a sensed power consumption state of at least one of the electrical devices[;]

a device sensor for monitoring output of a remote control device, said device sensor being coupled to the device processor, and wherein the device processor operates to terminate the power supplied to the external electrical device based upon the absence

of the detection of output of the remote control device by the sensor.

Id. at 15:5–19, 15:44–51, 16:1–16, 16:26–48.

II. DISCUSSION

A. Principles of Law

To prevail in its challenge to Patent Owner’s patent claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). “This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination.” *Id.*

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.* Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioner contends that a person having ordinary skill in the art at the time of the invention would have had “at least an undergraduate degree in Electrical Engineering and three years of experience working with designing hardware and software interfaces and power supply and monitoring systems, or an equivalent combination of education and experience in related fields.” Pet. 6–7. Petitioner’s declarant, Mr. Thomas A. Gafford, likewise opines that a person of ordinary skill in the art would have had that background. Ex. 1006 ¶ 17.

Patent Owner did not file a Patent Owner Response and thus does not challenge Petitioner’s contention or Mr. Gafford’s testimony regarding the level of one of ordinary skill in the art at the time of the invention.⁶

We determine that the level of ordinary skill proposed by Petitioner and Petitioner’s declarant is consistent with the challenged patent and the asserted prior art, and we therefore adopt that definition of the level of ordinary skill in the art for the purposes of the analysis below. *See* Ex. 1001, 1:14–15 (“The invention relates to aspects of the monitoring of electrical power supply to electrical equipment.”); Ex. 1002 ¶ 1 (“The present invention relates to a method and system to provide power saving for electronic devices while such devices are in the standby mode and are not in use, particularly for a setting accommodating multiple electronic devices especially in the end-user sector.”); Ex. 1003 ¶ 1 (“The present invention refers to an automatic means switch device used to disconnect a load from the electrical mains line, particularly useful in association with electrical

⁶ We note that, in its Preliminary Response, Patent Owner did not challenge Petitioner’s contention or Mr. Gafford’s testimony regarding the level of ordinary skill in the art. *See generally* Prelim. Resp.

appliances controlled by remote control units like, for example, television sets.”) (emphasis omitted); Ex. 1007, 1:8–10 (“The present invention relates to [a] system and a device for monitoring a household electric user, in particular a household appliance.”).

C. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner notes that, in the decision to institute *inter partes* review in IPR2016-01336, the Board previously construed “electrical plug.” Pet. 8. Petitioner does not propose a different construction for “electrical plug” and does not propose an express construction for any other claim term. *Id.* at 7–8.

In its Preliminary Response, Patent Owner asserted that each claim term should be given its plain and ordinary meaning, and specifically proposed constructions for “connectable” and “communication apparatus.”

Prelim. Resp. 30–42. Patent Owner, however, did not file a Patent Owner Response. Patent Owner thus has not, after institution, proposed any claim constructions or addressed our preliminary constructions of “electrical plug” and “connectable” or how we mapped “communication apparatus” to the prior art in our Institution Decision. *See* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”); *In re Nuvasive, Inc.*, 842 F.3d 1376, 1379–1382 (Fed. Cir. 2016) (holding Patent Owner waived an argument addressed in Preliminary Response by not raising the same argument in Patent Owner Response).

We determine that no claim terms require express construction. We address the scope of the terms “connectable” and “communication apparatus” in connection with our analysis below of the unpatentability of claims 8 and 12, respectively. *See infra* Sections II.E.2.b., II.E.2.c.

D. Asserted Obviousness over EP ’379 and the ’707 patent

Petitioner contends that claim 10 is unpatentable under 35 U.S.C. § 103(a) as obvious over EP ’379 and the ’707 patent. Pet. 3, 8–20. Relying in part on the testimony of Mr. Gafford, Petitioner explains how the references allegedly teach or suggest the claim limitations and provides purported reasoning for combining the teachings of the references as claimed. *Id.* at 8–20 (citing Ex. 1006).

As stated above, Patent Owner did not file a Patent Owner Response. We also note that Patent Owner did not challenge in its Preliminary Response Petitioner’s contention that the subject matter of claim 10 would have been obvious over EP ’379 and the ’707 patent. *See generally* Prelim. Resp. The burden, however, remains on the Petitioner to demonstrate by a

preponderance of the evidence that claim 10 is unpatentable. 35 U.S.C. § 316(e); *Dynamic Drinkware*, 800 F.3d at 1378.

We have reviewed Petitioner’s arguments in the Petition as well as the evidence discussed in the Petition, including the declaration of Mr. Gafford. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claim 10 is unpatentable as obvious over EP ’379 and the ’707 patent.

1. Summary of EP ’379

Petitioner asserts that the ’099 patent “is a national stage entry of a PCT patent application designating the United States, filed on June 3, 2010 and claims priority to Australian patent application AU2009902532.” Pet. 7. Petitioner argues that “the effective filing date of the ’099 patent is June 3, 2010,” and “the earliest priority date of the ’099 patent is June 3, 2009”—the filing date of the Australian patent application. *Id.* Petitioner contends that EP ’379—which was published April 22, 2009—is prior art under 35 U.S.C. § 102(a) or § 102(b). Pet. 3.

Patent Owner did not challenge the prior art status of EP ’379 in its Preliminary Response. *See generally* Prelim. Resp. Patent Owner also did not argue or provide any supporting evidence that the claims at issue are entitled to an invention date prior to June 3, 2009, the filing date of the Australian patent application. Because EP ’379 was published before the earliest possible invention date of record in this proceeding, Petitioner has shown by a preponderance of the evidence that EP ’379 is prior art to claims 8 and 10–16 of the ’099 patent at least under 35 U.S.C. § 102(a).

EP ’379 discloses a power saving system for electronic devices when the devices are in standby mode and not in use. Ex. 1002, 1. According to

EP '379, television sets, audio systems, DVD players, and “many similar electronic devices widely used in the end-user electronics market consume energy in their standby mode, though the amount of energy consumed in this mode is less as compared to their operating mode.” *Id.* ¶ 2. EP '379 explains that an advantage of the invention described therein is saving energy that many devices consume during their standby period. *Id.* ¶ 28.

Figure 2 of EP '379, below, illustrates a block diagram of the power saving system:

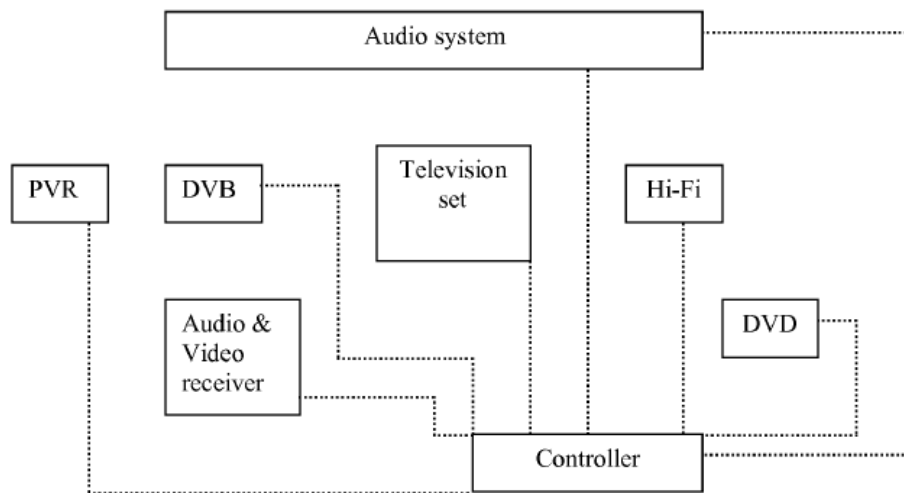


Figure 2

Id. ¶ 12. As shown above in Figure 2, a controller is connected to electronic devices such as television set, DVD player, and audio and video receiver.

Id. ¶¶ 16, 17, 21.

Figure 3 of EP '379, below, illustrates the components of the controller:

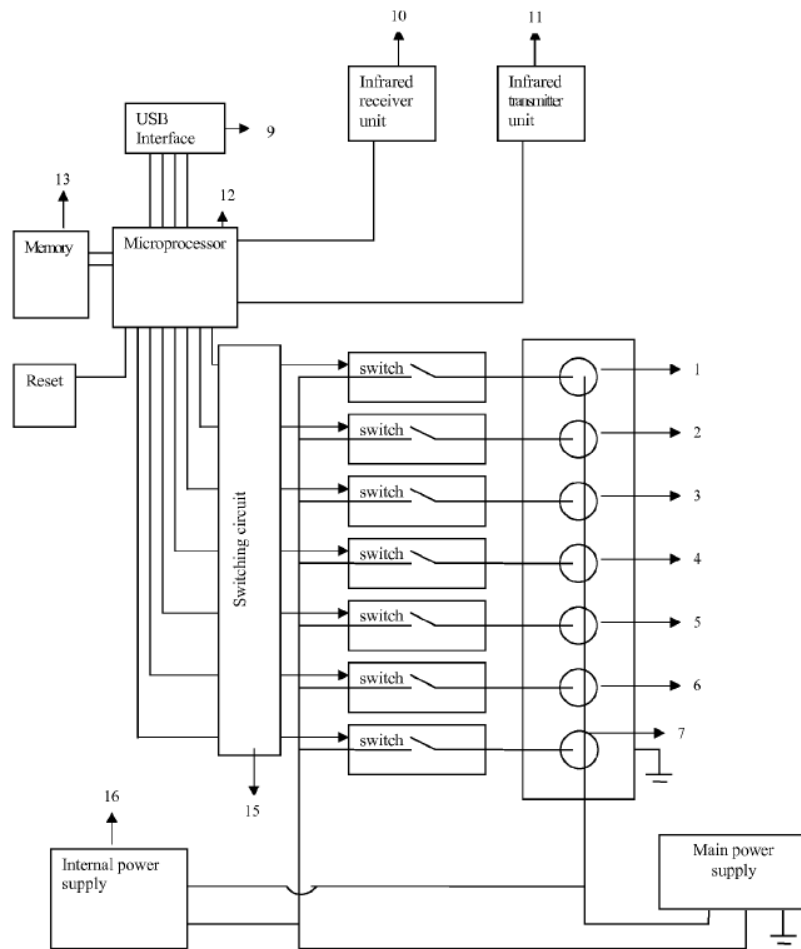


Figure 3

Id. ¶ 12. As shown in Figure 3 above, the controller includes memory 13, microprocessor 12, a signal receiving unit (in this example, infrared receiver unit 10), a signal transmitting unit (in this example, infrared transmitter unit 11), a main power supply, internal power supply 16, switches for powering on or off electronic devices 1 to 7 (shown in Figure 1), and plug outputs for connecting to electronic devices 1 to 7. *Id.* ¶¶ 16, 17, 21, 23.

EP '379 describes an example in which a user utilizes a remote control to transmit a signal to switch the television to standby mode, and the internal electronics of the television switch the television to standby mode. *Id.* ¶¶ 19, 24. EP '379 discloses that the controller senses the remote control

signal and completely interrupts the power to the television after a short period of time, according to a predetermined shutting-down rule. *Id.*

According to EP '379, the controller also completely interrupts the power to other connected devices in accordance with rules stored in the memory of the controller. *Id.* ¶ 21. For example, the controller may also interrupt the power to the DVD player and the video/audio receiver, thereby saving power to all three devices. *Id.*

EP '379 also discloses that when the controller does not sense a signal from the remote control for a certain period of time (e.g., three hours), the controller may power off the devices connected to it in accordance with an automatic turning-off rule. *Id.* ¶ 26.

2. Summary of the '707 patent

The '707 patent is a U.S. patent titled “System and Device for Monitoring at Least One Household Electric User, in Particular a Household Appliance.” Ex. 1007, [54]. The '707 patent issued April 25, 2006 and is prior art to the '099 patent under 35 U.S.C. § 102(b). *Compare id.* [45], with Ex. 1001, [22], [30].

Figure 1 of the '707 patent is shown below:

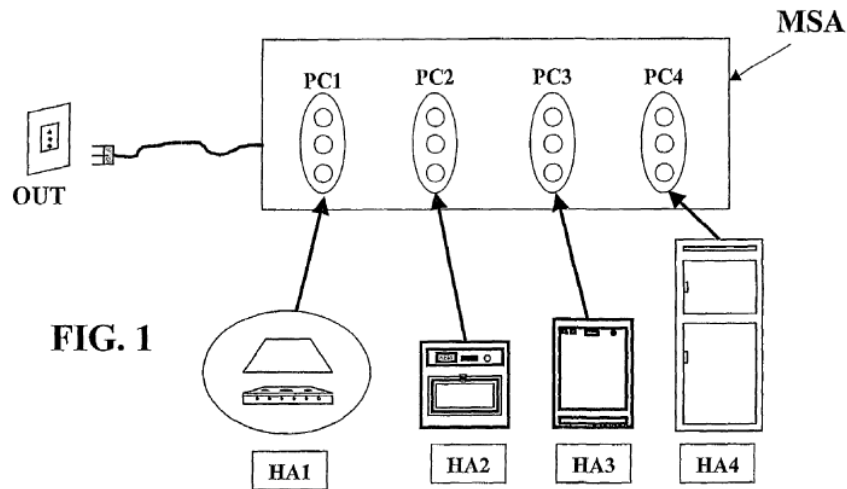


Figure 1 above illustrates a Multiple Smart Adapter (MSA) and a plurality of household electrical users (appliances) HA1–HA4, such as an electric oven, a dishwasher, and a refrigerator. Ex. 1007, 5:11–18. The '707 patent discloses that the MSA “is interposed between a current outlet indicated with ‘OUT’ in FIG. 1 and the electric users HA1–HA4.” *Id.* at 5:23–28.

According to the '707 patent, the MSA monitors and controls the electric users. *Id.* at 5:32–6:3. Figure 2, below, illustrates an implementation of the MSA:

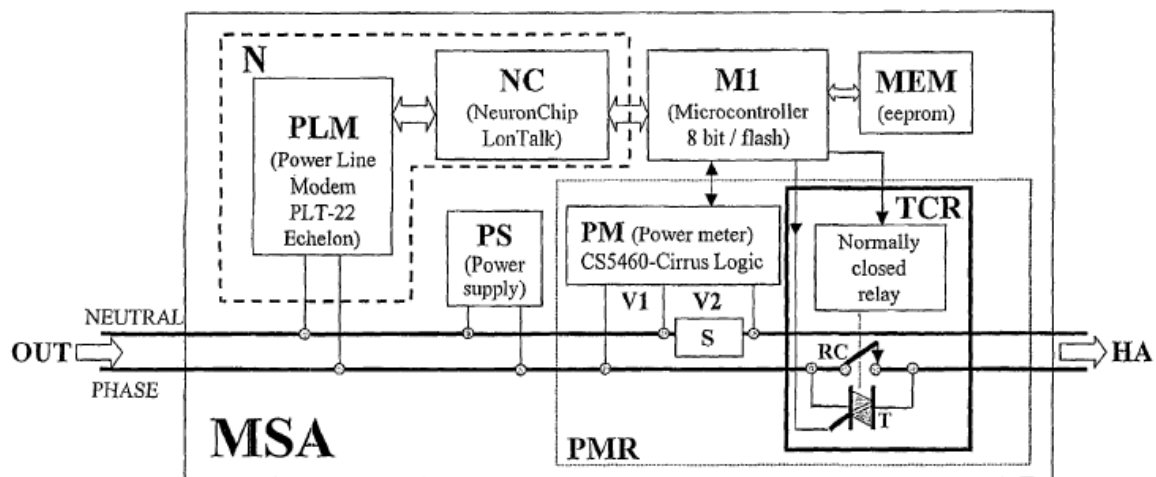


FIG. 2

Id. at 6:4–5. As illustrated above, the MSA includes a power meter (PM), which measures current absorbed by loads HA1–HA4 and the voltage applied to their terminals. *Id.* at 6:62–7:4. The '707 patent discloses that the PM meters voltage V2, which is detected at the terminals of current sensor S, and voltage V1, and derives quantities “such as cost, power and energy . . . through appropriate mathematic elaborations.” *Id.* at 6:62–7:9.

3. Analysis

Petitioner contends that the combination of EP '379 and the '707 patent teaches the limitations of claim 10. Pet. 8–20. Petitioner cites passages of EP '379, and identifies components of the controller illustrated in Figure 3 of EP '379 that purportedly correspond to each limitation of claim 10, except the claimed “electrical plug.” *Id.* at 8–20. Petitioner asserts that EP '379 “is silent regarding whether the connection between the switches and the main power supply is an electrical plug” but that “[i]t was well-known at the time that electrical plugs were used for connecting energy saving devices to mains power supply.” *Id.* at 9 (citing, e.g., Ex. 1006 ¶ 20). Petitioner cites as an example the '707 patent, which according to Petitioner describes an energy device that includes an electrical plug for connecting its energy device to the mains power supply. *Id.* at 9–11 (citing, e.g., Ex. 1007, Abstract, Fig. 1; Ex. 1006 ¶¶ 54, 60). Petitioner also provides purported reasons for combining the teachings of EP '379 and the '707 patent as claimed. *Id.* at 11–12.

Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 10 is unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379 and the '707 patent. See Pet. 8–20.

EP '379 discloses “[a]n energy saving device.” Ex. 1002, [57] (disclosing “a method and system to provide power saving for electronic devices while such devices are in the standby mode and are not in use”); Ex. 1006 ¶ 60. The disclosed energy saving device is a controller that controls the on, standby, and off status of electronic devices. Ex. 1002 ¶ 14.

The combination of EP '379 and the '707 patent teaches that the energy saving device includes “an electrical plug configured for connecting to a mains power supply.” EP '379 discloses that the energy saving device is configured for connecting to a main power supply, as illustrated in Petitioner’s annotated version of Figure 3 of EP '379, below:

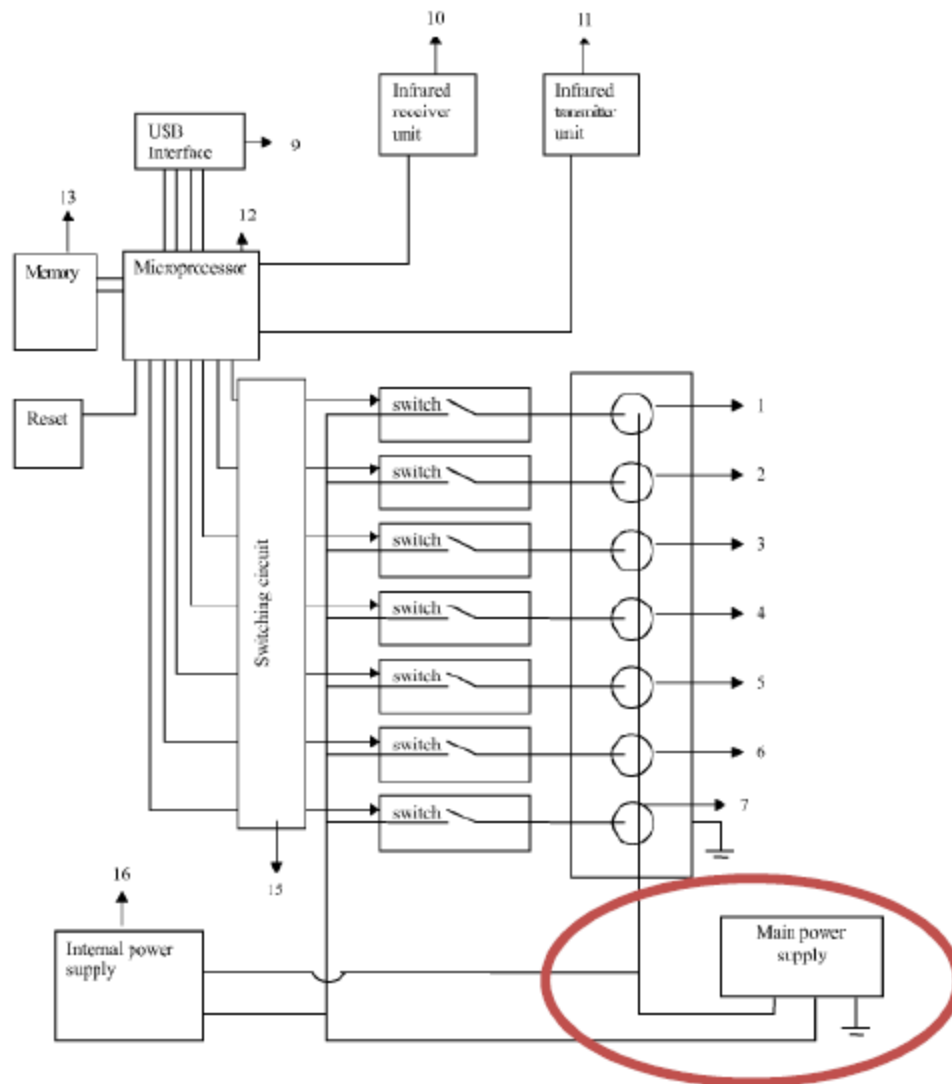


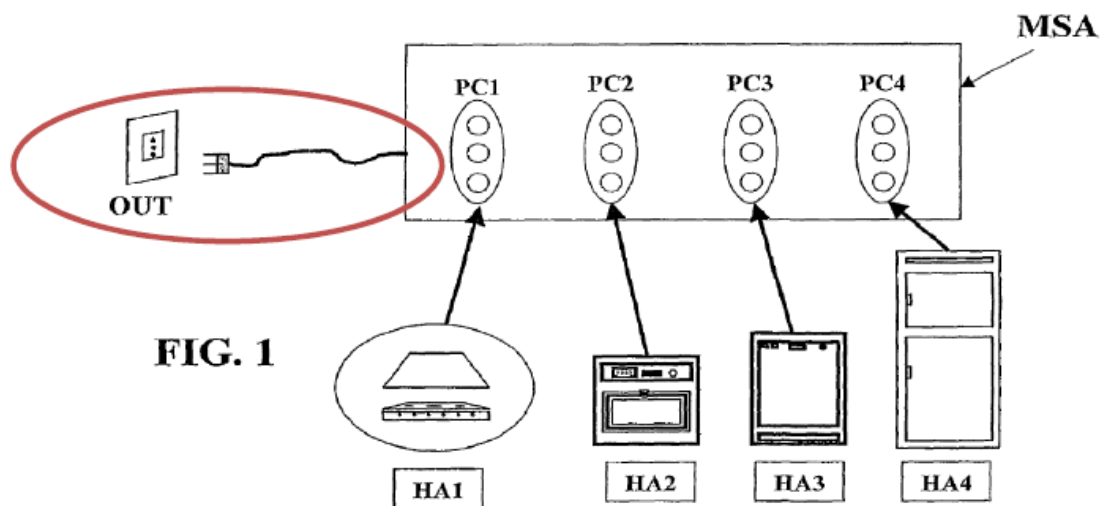
Figure 3

Pet. 9; Ex. 1002, Fig. 3, ¶ 23; Ex. 1006 ¶¶ 51, 52, 60. Petitioner’s annotated Figure 3 adds a red oval around the illustrated “[m]ain power supply.”

Pet. 9; Ex. 1002 ¶ 23. EP ’379 discloses that the line connecting the switches of the controller to the main power supply (as opposed to “internal” power supply 16 illustrated in Figure 3) is an input connectable to an external power supply. Ex. 1002, Fig. 3, ¶¶ 12 (“Figure 3 is a block diagram representing the internal structure of a controller employed according to the

present invention.”), 23 (“As can be seen in Figure 3, the controller may include many power switches (14a–14g) capable to powering on and off the relevant units [and] a main power supply (13) for the controller’s power consumption”); *see also* Ex. 1006 ¶¶ 52 (opining that Figure 3 shows that “the power saving system controller receives mains power”), 60 (opining that main power supply depicted in Figure 3 is an external source of power supply).

The ’707 patent discloses an electrical plug for connecting an energy saving device to a mains power supply, as illustrated in Petitioner’s annotated version of Figure 1 of the ’707 patent:



Pet. 10; Ex. 1007, Fig. 1, 5:10–17, 5:22–27. Petitioner’s annotated Figure 1 above adds a red oval around the depicted electrical cord and current outlet labeled “OUT.” Pet. 10; Ex. 1007, Fig. 1, 5:22–27. The ’707 patent discloses that a monitoring device called a Multiple Smart Adapter (MSA) is connectable to the current outlet “OUT” via an electrical cord with a plug. Ex. 1007, Fig. 1, 5:10–17, 5:22–27; *see also* Ex. 1006 ¶ 60 (opining that the

'707 patent illustrates an energy saving device including an electrical plug connectable to a mains power supply).

EP '379 also discloses that the energy saving device includes “an electrical socket configured for connecting to an electrical device.” EP '379 discloses seven sockets for connecting to external devices 1–7, respectively, as illustrated in Petitioner’s annotated version of Figure 3 of EP '379, below:

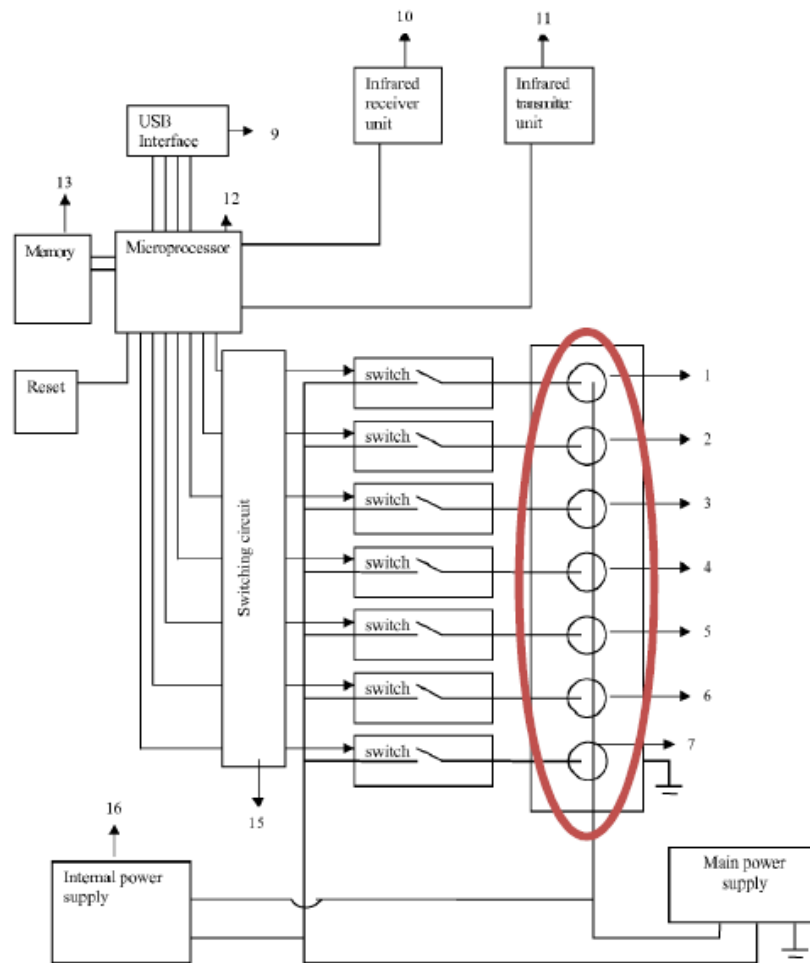


Figure 3

Pet. 12–13; Ex. 1002, Figs. 1–3, ¶ 21. Petitioner’s annotated Figure 3 adds a red oval around the illustrated sockets/plugs of the controller. Pet. 12–13; Ex. 1002 ¶ 23. EP '379 states that “[t]here are plugs (not shown in Figure 1)

provided on the controller unit, and each device is connected to a plug previously reserved for it.” Ex. 1002 ¶ 21; *see also id.* ¶ 23 (“[T]he plug outputs are previously assigned for certain devices, as illustrated in Figure 3.”). EP ’379 discloses that the sockets/plugs are for interconnecting electronic devices 1–7 illustrated in Figure 1 to the controller, as shown in Figure 2. Ex. 1002 ¶ 21, claim 6 (“the plugs, i.e.[,] power sockets”).

EP ’379 also discloses that the energy saving device includes “a switch configured to control electrical connection between said electrical plug and said electrical socket.” EP ’379 discloses that the controller includes switches, as illustrated in Petitioner’s annotated Figure 3 below:

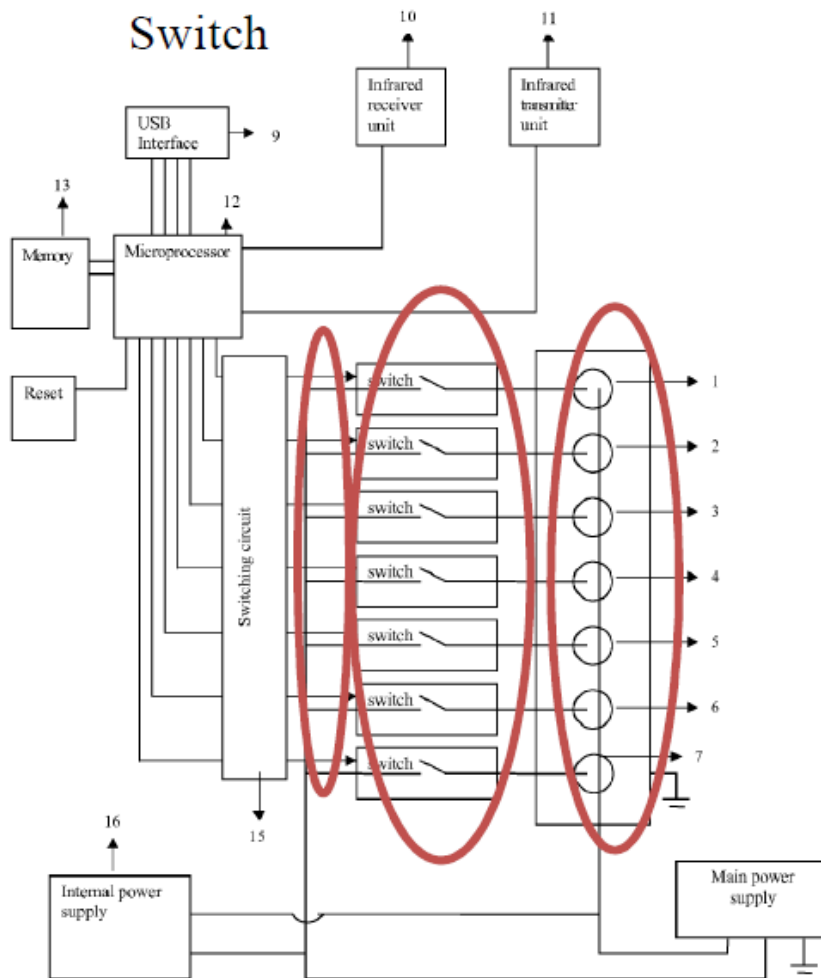


Figure 3

Pet. 14; Ex. 1002, Fig. 3, ¶ 23. Petitioner’s annotated Figure 3 above adds red ovals around the seven input lines to the switches, the seven switches, and the seven sockets/plugs. Pet. 14; Ex. 1002, Fig. 3. EP ’379 discloses that “the controller may include many power switches (14a–14g) capable to powering on and off the relevant units.” Ex. 1002 ¶ 23. EP ’379 also discloses that the switches are under selective control to control the connection between a socket and the connection to the main power supply. *Id.* ¶¶ 19 (disclosing that the controller “is designed so as to individually or

collectively interrupt the power of electronic device(s) connected to it”), 24 (disclosing that the power of a device “is interrupted by means of the controller according to a predetermined shutting-off rule”).

EP ’379 also discloses that the energy saving device includes “a sensor configured to wirelessly sense activity of a user-operated remote control device, the activity configured to control said electrical device.” EP ’379 discloses that “[w]hen the user transmits a signal by means of a remote controller to switch a device that is controllable by the remote controller . . . , this signal is sensed also by the signal receiver provided on the controller.” *Id.* ¶ 19. EP ’379 similarly states that “the signals of remote controls of electronic devices connected to the subject controller [are] sensed, identified, and interpreted by the controller.” *Id.* ¶ 23; *see also id.* ¶ 26 (stating that “the remote control signals controlling the devices connected to the controller can also be sensed by the controller”). According to EP ’379, “[t]he controller unit identifies as to which electronic device’s remote control the user has depressed by means of the signal receiver (10) on itself.” *Id.* ¶ 24. Figure 3 illustrates the signal receiver as “[i]nfrared receiver unit” 10. *Id.* at Fig. 3, ¶ 24.

EP ’379 and the ’707 patent also collectively teach that the energy saving device includes “a control module configured to monitor the sensor to determine a first length of time during which said activity has not been detected and to operate said switch to disconnect electrical connection between the electrical plug and the electrical socket when said first length of time exceeds a threshold value to prevent the electrical device from drawing power during at least some times when no user is present and using the electrical device.” EP ’379 discloses that the controller includes

microprocessor 12, which terminates power supplied to the external electrical device based upon the absence of detection of signals from the remote control. *Id.* ¶ 26. EP '379 states the following:

The controller can be set to a predetermined time period in order to save power, and if no signal is received within this time period from a remote control of any device connected to it, the controller can turn OFF such devices in turn or at the same time according to a predetermined power saving rule.

Id.; see also *id.* ¶ 19 (“[A]fter the television is switched to the standby mode by the user, the power of the television system is completely interrupted, with the controller sensing the same signal and executing a predetermined shutting-down rule.”). EP '379 adds an example of a user setting the automatic turn-off period to three hours. *Id.* ¶ 26. According to this example, “if the user does not depress any key on any remote control of any electronic device connected to the controller, or if no signal is sensed by the controller within three hours, the controller may power off the electronic devices connected to itself in sequence according to an automatic turning-off rule.” *Id.*

EP '379 thus teaches disconnecting the electrical connection between the input to the switch (which is connected to a main power supply) and the electrical socket according to the turning-off rule. Ex. 1002 ¶¶ 19, 26; Ex. 2006 ¶ 64. Petitioner also persuasively shows that disconnecting a connection between an electrical plug connected to a mains power supply and the electrical socket according to the turning-off rule would have been obvious to one of ordinary skill in the art in view of the combination of EP '379 and the '707 patent. Pet. 11–12, 19–20. As explained above, the

'707 patent teaches connecting a power saving device to the mains power supply with an electrical plug. Ex. 1007, Fig. 1, 5:10–17, 5:22–27.

Moreover, Petitioner provides persuasive reasoning with rational underpinning for combining the teachings of EP '379 and the '707 patent as claimed. See Pet. 11–12, 19–20. Both references teach energy saving devices connected to a mains power supply. Ex. 1002, [57], Fig. 3, ¶¶ 19, 23, 26; Ex. 1006 ¶¶ 52 (opining that Figure 3 of EP '379 shows that “the power saving system controller receives mains power”), 55; Ex. 1007, Fig. 1, 4:14–27, 5:10–17, 5:22–27, 11:52–58. The combination uses the known method of using electrical plugs to connect to mains power supplies and yields the predictable result of the energy saving device working in the same manner. Ex. 1006 ¶¶ 55–57; *KSR*, 550 U.S. at 416 (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”). A person of ordinary skill in the art would have been motivated to add an electrical plug as taught by the '707 patent to the teachings of EP '379 because it would have been desirable to connect the energy saving device to the outlet for mains power voltage supply. Ex. 1006 ¶ 56.

In sum, Petitioner shows by a preponderance of the evidence that claim 10 is unpatentable as obvious over EP '379 and the '707 patent.

E. Asserted Obviousness over EP '379, EP '752, and the '707 Patent

Petitioner contends that claims 8 and 11–16 of the '099 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379, EP '752, and the '707 patent. Pet. 3, 20–67. Relying in part on the testimony of Mr. Gafford, Petitioner explains how the references allegedly teach or suggest

the claim limitations and provides purported reasoning for combining the teachings of the references as claimed. *Id.* at 20–67.

As stated above, Patent Owner did not file a Patent Owner Response. We also note that Patent Owner did not challenge in its Preliminary Response Petitioner’s contention that the subject matter of dependent claim 11 would have been obvious over EP ’379 and EP ’752. *See generally* Prelim. Resp. Nor did Patent Owner raise in its Preliminary Response any arguments specific to the limitations added by dependent claims 13–16. *See id.* Nevertheless, the burden remains on the Petitioner to demonstrate by a preponderance of the evidence that the subject matter of these claims would have been obvious. 35 U.S.C. § 316(e); *Dynamic Drinkware*, 800 F.3d at 1378.

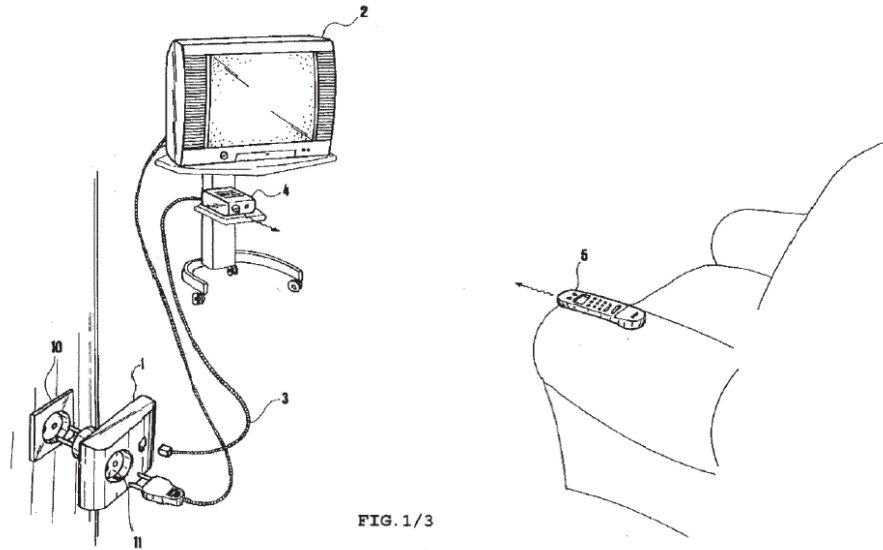
We have reviewed Petitioner’s arguments in the Petition as well as the evidence discussed in the Petition, including the declaration of Mr. Gafford. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claims 8 and 11–16 of the ’099 patent would have been obvious over EP ’379, EP ’752, and the ’707 patent.

1. Summary of EP ’752

EP ’752 is a European patent application publication published on July 17, 2002. Ex. 1003, [43]. EP ’752 is prior art to the ’099 patent under 35 U.S.C. § 102(b). *Compare* Ex. 1003, [43], *with* Ex. 1001, [22].

EP ’752 discloses an automatic mains switch device that monitors the presence of a load on an electric power line and disconnects the load when it is not in use. Ex. 1003, 1. Figure 1 of EP ’752, shown below, illustrates

mains switch device 1 connected to television set 2 and receiver unit 4 for receiving signals from remote control unit 5:



Id. ¶¶ 15, 17, Fig. 1. As illustrated in Figure 1 above, mains switch device 1 is connected to first mains power socket 10, and a load (here, television set 2) is connected to second mains power socket 11 in mains switch device 1. *Id.* ¶ 17.

The components of device 1 are illustrated in Figure 2 of EP '752, shown below:

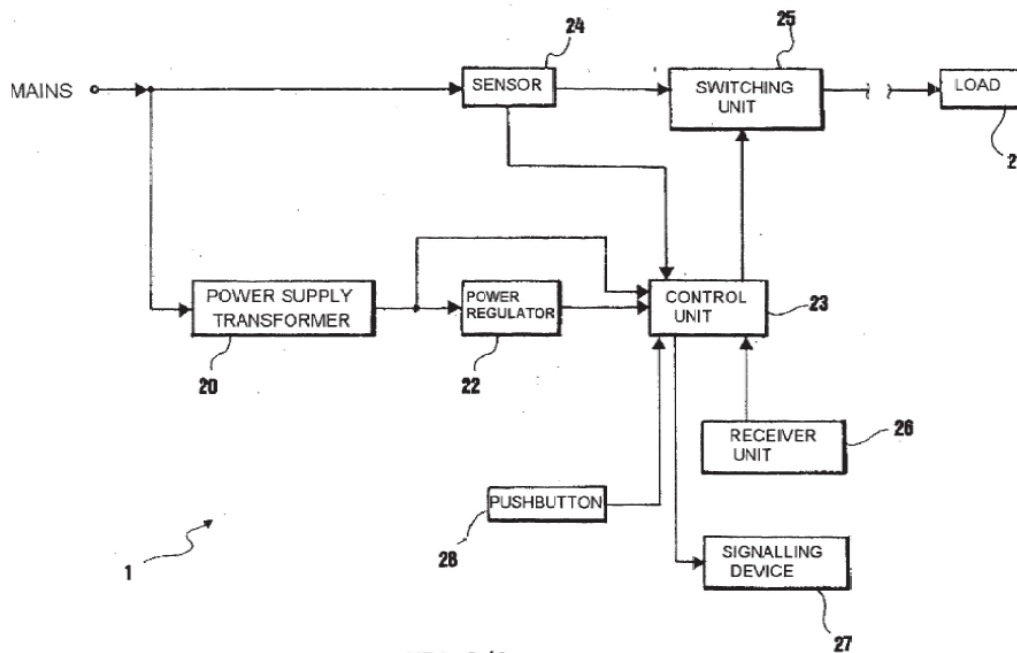


FIG. 2/3

Id. ¶ 15, Fig. 2. As illustrated above, mains switch device 1 is connected by means of power supply transformer 20 to the electric mains line from which the device takes the power required for its operation. *Id.* ¶ 18, Fig. 2.

Device 1 also includes sensor unit 24, which is used to detect the possible presence of an active electrical load connected to device 1. *Id.* ¶ 21, Fig. 2.

According to EP '752, “[s]ensor unit 24 will output a first electrical signal when the presence of an active load is detected and will output a second electrical signal when no active load is detected.” *Id.* ¶ 22. EP '752

discloses that “[s]ensor unit 24 will be able to detect . . . when the electric load has been turned off, i.e., when the television set has been turned off by

using its remote control unit.” *Id.* ¶ 34. EP '752 explains that in such a case, sensor unit 24 will send an appropriate signal to logical control unit 23,

which will disconnect load 2 from the mains power line. *Id.*

Device 1 also includes signaling device 27, which is used in connection with a deactivation procedure. *Id.* ¶¶ 26, 34, 35. EP '752

discloses that the signaling device may be a visual signaling device such as a light emitting diode (LED) or an acoustic device such as a buzzer. *Id.* ¶ 26. EP '752 describes an automatic deactivation feature in which, “after a pre-determined delay, e.g.[,] 60 minutes, the logical control unit 23 will activate switch unit 25 as to disconnect the load 2 from the mains power line.” *Id.* ¶ 35. EP '752 states that “[t]he automatic deactivation procedure is started over again every time a key on the remote control unit is pressed.” *Id.* EP '752 discloses that “[t]he visual [signaling] devices provided as part of the automatic mains switch device will be activated [a] few seconds before switch unit 25 is activated, to warn the user that disconnection of the electrical load is going to take place in a short time.” *Id.*; *see also id.* ¶ 34 (“The visual [signaling] devices provided as part of the automatic mains switch device will be activated during the delay period, to warn the user that the deactivation phase has been started.”).

2. Analysis

a. Claim 11

Claim 11 depends from claim 10 and adds limitations directed to a warning device and functions of the sensor and switch. Petitioner contends that the combination of EP '379, EP '752, and the '707 patent teaches the limitations of claim 11. Pet. 3, 53–55. Petitioner cites passages of EP '752 that purportedly teach the limitations added by claim 11. *Id.* at 53–54. Petitioner also provides purported reasons for combining the teachings of EP '379, EP '752, and the '707 patent as claimed. *Id.* at 20–25, 54–55.

Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious

over EP '379, EP '752, and the '707 patent. *See* Pet. 8–20. As explained above, the combination of EP '379 and the '707 patent teaches all of the limitations of claim 10. *See supra* Section II.D.3. In addition, EP '752 discloses an energy saving system with a warning device that provides a warning signal to a user that a threshold value (of time during which activity of a user-operated remote control device is not detected) is shortly to be reached, as required by claim 11. Specifically, as illustrated in Figure 2 of EP '752, the energy saving device in EP '752 includes signaling device 27, which warns a user that disconnection of an electrical load, such as a television, “is going to take place in a short time.” Ex. 1003 ¶ 35; *see id.* at Fig. 1, ¶¶ 16–17 (describing the example load of a television set). EP '752 states that “after a pre-determined delay, e.g. 60 minutes, the logical control unit 23 will activate switch unit 25 as to disconnect the load 2 from the mains power line.” *Id.* ¶ 35. EP '752 discloses that “[t]he visual [signaling] devices provided as part of the automatic mains switch device will be activated [a] few seconds before switch unit 25 is activated, to warn the user that disconnection of the electric load is going to take place in a short time.” *Id.*

EP '752 also teaches a sensor configured to detect a signal from a remote control device, that the signal is monitored by logical control unit, and that responsive to the signal, the switch is not operated to disconnect the electrical connection, as required by claim 11. Specifically, EP '752 discloses that logical control unit 23 receives a signal from a receiver unit, and that the receiver unit includes a sensor receiver integrated circuit “able to detect the infrared control signals generated by most of the remote control units currently used for remote control of television sets and similar

electrical appliances.” *Id.* ¶ 24. EP ’752 also discloses that “a visual [signaling] device 27 like, for example, a Light Emitting Diode, . . . will be used to notify the user, by means of predetermined lighting sequences, about the current status of the logical control unit 23.” Ex. 1003 ¶ 26. Also, as discussed above, EP ’752 discloses disconnecting the load after a pre-determined amount of time. In addition, EP ’752 discloses that “[t]he automatic deactivation procedure is started over again that every time a key on the remote control unit is pressed.” *Id.* ¶ 35. EP ’752 thus teaches that the switch is not operated to disconnect the electrical connection in response to detecting a signal from the remote control.

Petitioner also provides persuasive reasoning with rational underpinning for combining the teachings of EP ’379, EP ’752, and the ’707 patent as claimed. Pet. 20–25, 54–55. As explained above in connection with claim 10, a person of ordinary skill in the art would have been motivated to add an electrical plug as taught by the ’707 patent to the teachings of EP ’379. *See supra* Section II.D.3. In addition, EP ’379, EP ’752, and the ’707 patent all describe power saving devices aimed at addressing the problem of unused household electronic devices wasting power. Ex. 1002, [57], ¶¶ 17, 23, 24; Ex. 1003, [57], ¶¶ 9, 14, 20, 31, 36; Ex. 1007, [57], 6:42–7:9, 7:52–67, 11:52–58, 27:5–18. For example, EP ’379 discloses that “electronic devices widely used in the end-user electronics market consume energy in their standby mode” and that the invention described therein “provide[s] power saving for electronic devices while such devices are in the standby mode and are not in use.” Ex. 1002 ¶ 2, [57]. Similarly, EP ’752 discloses that an advantage of the device described therein “is the energy saving resulting from the complete

disconnection of the electric load from the mains line.” Ex. 1003 ¶ 14. The ’707 patent discloses “monitor[ing] the operation of an electric user” and “realizing a rational management of the consumption of electric energy in a household environment.” Ex. 1007, 7:52–57, 11:52–58. The references also describe devices that include a microprocessor for implementing power saving rules and other rules of operation. Ex. 1002, [57], ¶¶ 17, 23, 24; Ex. 1003 ¶¶ 8, 20, 23, 24, 26, 27, 36; Ex. 1007, 6:28–31, 6:42–7:9, 7:52–57, 11:52–58. A person of ordinary skill in the art would have been motivated to add an alert mechanism to the teachings of EP ’379 to provide a desirable, user-friendly feature of warning the user that power will be disconnected to a device prior to the disconnection. Such a warning, for example, would have enabled the user to press a key on the remote control to re-start the time period for the automatic turning-off rule prior to disconnection. *See* Ex. 1002 ¶ 26 (“Whenever the user depresses on any key in this predetermined time period, the predetermined time period may be reinitiated.”).

b. Claim 8

Claim 8 depends from claim 1. We previously determined that Petitioner showed by a preponderance of the evidence that claim 1 is unpatentable as anticipated by EP ’379. IPR2016-01336, slip op. at 16–21 (PTAB Dec. 20, 2017) (Paper 11). Claim 8 adds that the energy saving device of claim 1 further comprises “a power sensor configured to sense power consumption of the external electrical device, the processor being further configured to determine an operational state of the external electrical device from the sensed power consumption and to terminate the power supplied to the external electrical device when the external electrical device is determined to be in a selected state.”

With respect to the limitations of claim 1, Petitioner relies on essentially the same evidence and analysis that it relied on in IPR2016-01336. *See* Pet. 26 (“For the sake of being complete, the analysis with respect to claim 1 from IPR2016-01336 is repeated here followed by the analysis of the specific limitations added in claim 8.”). Petitioner then cites passages of EP ’752 and the ’707 patent that purportedly teach the limitations added by claim 8. *Id.* at 33–36. Petitioner also provides purported reasoning for combining the teachings of EP ’379, EP ’752, and the ’707 patent as claimed. *Id.* at 20–25, 54–55.

Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 8 is unpatentable under 35 U.S.C. § 103(a) as obvious over EP ’379, EP ’752, and the ’707 patent. *See* Pet. 8–20.

First, EP ’379 discloses an energy saving device for reducing power consumption of an external electrical device. Ex. 1002, [57] (disclosing “a method and system to provide power saving for electronic devices”); Ex. 1006 ¶ 51. EP ’379 also discloses turning off devices for which no signal is received from a remote control for a predetermined time period. *Id.* ¶ 26.

EP ’379 also discloses that the energy saving device includes an input connectable to an external power supply, as illustrated in Petitioner’s annotated version of Figure 3 of EP ’379, below:

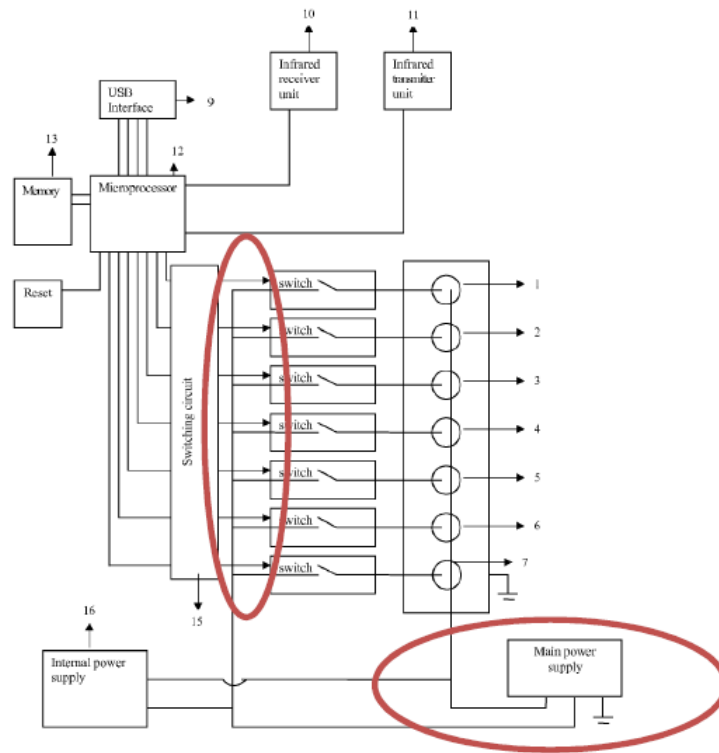


Figure 3

Pet. 26–27; Ex. 1002, Fig. 3, ¶ 23; Ex. 1006 ¶ 105. Petitioner’s annotated Figure 3 adds red ovals around the main power supply and the input to the switches that selectively power electronic devices 1–7. Pet. 27; Ex. 1002 ¶ 23. EP ’379 discloses that the line connecting the switches to the main power supply (as opposed to “internal” power supply 16 illustrated in Figure 3) is an input connectable to an external power supply. Ex. 1002, Fig. 3, ¶ 23; *see also* Ex. 1006 ¶ 105 (opining that the main power supply depicted in Figure 3 is an external power supply).

In its Preliminary Response, Patent Owner sought to exclude from the scope of the phrase “an input connectable to an external power supply” a device that is permanently wired to mains electrical power. Patent Owner contends that, in EP ’379, the line leading from the main power supply

“appears to be hardwired.” Prelim. Resp. 45. As we discussed in our institution decision (Inst. Dec. 10–12), Patent Owner asserted that “connectable” means “can be both connected and disconnected.” Prelim. Resp. 32. Patent Owner argued that the ’099 patent discloses both *plug-in devices* and devices *permanently wired* to mains electrical power. *Id.* Patent Owner argued that a person having ordinary skill in the art would refer to an energy saving device that uses an electrical plug as “an electrical device ‘*connectable*’ to an external power supply” and would refer to an energy saving device that is permanently wired to mains electrical power as “an electrical device ‘*connected*’ to the mains electrical power *but not* an electrical device ‘*connectable*’ to the mains electrical power.” *Id.* (citing Ex. 1001, 9:8–13) (emphases added). Patent Owner relied exclusively on one passage from the ’099 patent—column 9, lines 8 through 13—and did not rely on any other evidence, such as a declaration of an expert in the field.

The written description of the ’099 patent consistently uses the same or substantially similar language to describe connecting the energy saving device to the mains power, regardless of whether the embodiment being described is a plug embodiment or a permanently wired embodiment. The written description does not use the term “connectable” in connection with any of the embodiments. For example, in reference to the Figure 1 embodiment, the ’099 patent states “[e]nergy saving device 12 has a mains power plug 18 for connection to a mains power supply (not shown).” Ex. 1001, 5:63–64. The ’099 patent states that, in the Figure 2 embodiment, “[p]ower board 12a is connected to a mains power outlet via mains power plug 18.” *Id.* at 8:13–14. In describing the plug embodiment of Figure 3, the ’099 patent states the following:

As with the other embodiments, universal wall plug 10a is *connected* to mains power through mains power plug 18, this connection providing mains power to wall plug 12b and devices connected to outlets 14 and 16, as well as connection to the mains power line carrier system 38.

Ex. 1001, 9:8–13 (emphasis added).

Finally, the passage in the '099 patent that describes devices permanently wired to mains electrical power is the following:

The energy saving device may take any desired form but preferably is a power board, a general power outlet (GPO), a wall plug or an energy centre. It is preferred that the system or method of the invention are used in connection with “plug-in” electrical devices, but the system or method may also be used with electrical devices which are permanently wired to mains electrical power. In the latter case, the energy saving device could be incorporated into the mains wiring infrastructure or incorporated as an integral part of mains powered equipment.

Id. at 4:21–29. Patent Owner did not point to any statement in the above passage that excludes an input “connectable” to an external power supply. *See* Prelim. Resp. 30–32.

Thus, the written description does not sufficiently support Patent Owner’s argument that one of ordinary skill in the art would *not* refer to an energy saving device permanently wired to mains power as “connectable” to the mains power supply.

Moreover, as we noted in our institution decision (Inst. Dec. 11–12), the ordinary meaning of the suffix “able” is “capable of” or “fit for.” *See* Ex. 3002 (defining “-able” as “capable of, fit for, or worthy of (being so acted upon or toward)—chiefly in adjectives derived from verbs”). Thus, the ordinary meaning “connectable” is “capable of connecting.”

In sum, we do not find support in the intrinsic record for excluding from the scope of the “input connectable” limitation the hardwired connection which Patent Owner asserts “appears to be” disclosed in EP ’379. *See generally* Ex. 1001, Ex. 1005; *see also* Ex. 1005, 89 (applicant arguing that a power transmission device (laptop) is not “an input connectable to an external power supply”), 35–36 (examiner’s statement of reasons for allowance, which does not address “an input connectable to an external power supply”). Thus, EP ’379’s disclosure in Figure 3 of a line connecting the switches to the main power supply (as opposed to “internal” power supply 16 illustrated in Figure 3) is a disclosure of “an input connectable to an external power supply,” as required by claim 1. Ex. 1002, Fig. 3, ¶ 23; *see also* Ex. 1006 ¶ 105 (opining that the main power supply depicted in Figure 3 is an external power supply).

EP ’379 also discloses that the energy saving device includes an output connectable to the external electrical device for selectively providing operating power thereto, as illustrated in Petitioner’s annotated version of Figure 3:

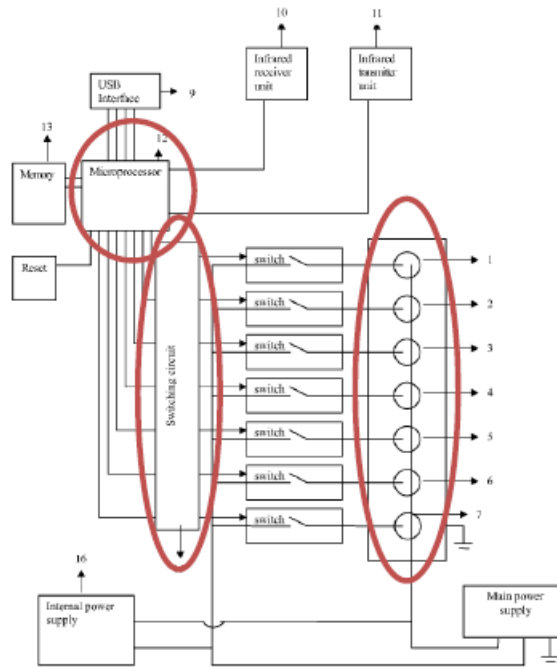


Figure 3

Pet. 28–29 (citing Ex. 1002, Fig. 3, ¶¶ 23, 24; Ex. 1006 ¶ 105). Petitioner annotates Figure 3 above with red circles around a microprocessor, switching circuit, and plug outputs. *Id.* at 28; Ex. 1002, Fig. 3, ¶ 23. EP ’379 discloses that “the plugs (i.e. wall plugs) to connect . . . electronic devices are placed on [the] controller.” Ex. 1002 ¶ 16; *see also id.* ¶ 21 (disclosing that electronic devices 1–7 (illustrated in Figure 1) are connected to the controller via plugs on the controller). EP ’379 also discloses that “the controller may include power switches (14a-14g) capable to powering on and off the relevant units.” *Id.* ¶ 23. EP ’379 also discloses that the switches selectively connect the external electrical devices to the main power supply and thereby selectively provide operating power to the external electrical device, as claimed. *Id.* ¶¶ 23, 26 (“[I]f the user does not depress any key on any remote control of any electronic device connected to the controller, . . . the controller may power off the electronic devices

connected to itself in sequence according to an automatic turning-off rule.”). Thus, EP ’379 discloses a plug output connectable to an electronic device for selectively powering that device.

EP ’379 also discloses that the energy saving device includes a processor for controlling when power is supplied to the external device. Ex. 1002, Fig. 3, ¶ 24; Ex. 1006 ¶ 105. Specifically, EP ’379 discloses a microprocessor (element 12 in Figure 3), which implements a turning-ON rule for, for example, switching an electronic device to standby mode. Ex. 1002, Fig. 3, ¶ 24. EP ’379 discloses that “[t]he controller unit identifies as to which electronic device’s remote control the user has depressed . . . and then, allows power to be supplied to the relevant electronic device according to the ON/OFF status of devices stored on its memory (13), and to a turning-ON rule stored on its microprocessor (12).” *Id.* ¶ 24.

EP ’379 also discloses that the energy saving device includes a sensor for monitoring wireless output signals of a remote control device, the sensor being coupled to the processor, and wherein the processor operates to terminate the power supplied to the external electrical device based upon the absence of the detection of wireless output signals of the remote control device by the sensor. Ex. 1002, Fig. 3, ¶¶ 23, 24, 26; Ex. 1006 ¶ 105.

Petitioner’s annotated Figure 3 is below:

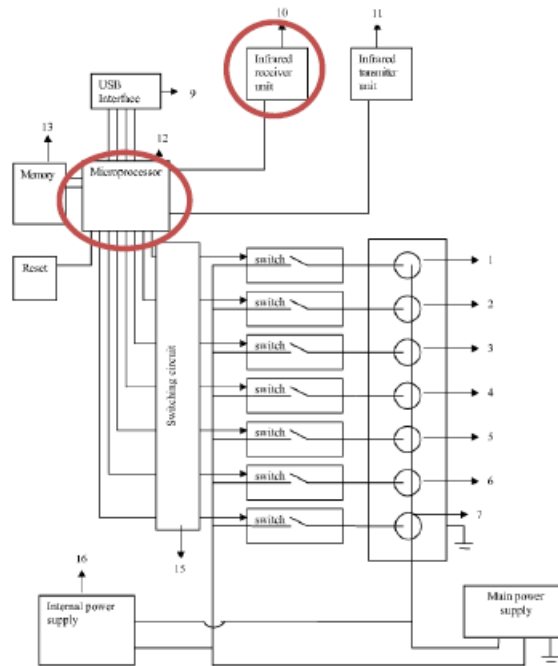


Figure 3

Pet. 30–31. As illustrated above, Petitioner adds red ovals around what it contends, and with which we agree, correspond to the claimed sensor and microprocessor: infrared receiver unit 10 and microprocessor 12. *Id.*

EP '379 discloses that infrared receiver unit 10 is coupled to microprocessor 12 and that the infrared receiver unit monitors wireless output signals from a remote control. Ex. 1002, Fig. 3, ¶¶ 24, 26. Specifically, EP '379 discloses that “the signals of the remote controls of electronic devices connected to the subject controller [are] sensed, identified, and interpreted by the controller.” *Id.* ¶ 23; see also *id.* ¶ 26 (stating that “the remote control signals controlling the devices connected to the controller can also be sensed by the controller”). According to EP '379, “[t]he controller unit identifies as to which electronic device’s remote control the user has depressed by means of the signal receiver (10) on itself.” *Id.* ¶ 24.

EP '379 also discloses that the microprocessor terminates power supplied to the external electrical device based upon the absence of detection of signals from the remote control. *Id.* ¶ 26. EP '379 states the following:

The controller can be set to a predetermined time period in order to save power, and if no signal is received within this time period from a remote control of any device connected to it, the controller can turn OFF such devices in turn or at the same time according to a predetermined power saving rule.

Id. EP '379 adds an example of a user setting the automatic turn-off period to three hours. *Id.* Under this example, according to EP '379, “if the user does not depress any key on any remote control of any electronic device connected to the controller, or if no signal is sensed by the controller within three hours, the controller may power off the electronic devices connected to itself in sequence according to an automatic turning-off rule.” *Id.*

The combination of EP '752 and the '707 patent teaches that the energy saving device further comprises a power sensor configured to sense power consumption of the external electrical device. *See* Pet. 33–36. EP '752 discloses that its energy saving device (the automatic mains switch device) includes sensor 24 (illustrated in Figure 2) “to detect the possible presence of an active electric load” connected to the device. Ex. 1003 ¶ 21. According to EP '752, sensor unit 24 includes a Hall effect sensor that “detect[s] possible variations of the magnetic field produced by the electric current flowing through the wires used to power the electronic load 2.” *Id.* ¶¶ 8, 21, 22, Figs. 2, 3. EP '752 does not expressly disclose that sensor 24 senses power consumption. The '707 patent provides such a teaching. *See* Ex. 1006 ¶¶ 75–83. The '707 patent discloses a Multiple Smart Adapter

(MSA), shown below, that monitors and controls electric users such as household appliances. Ex. 1007, [57], 5:12–6:3.

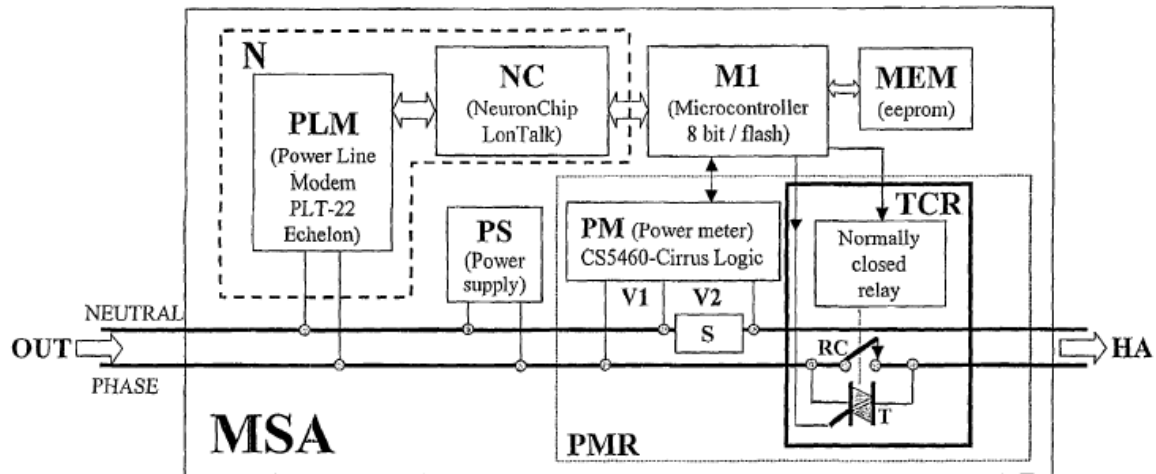


FIG. 2

As illustrated above, the MSA includes a power meter (PM), which measures current absorbed by electric users (HA1–HA4 in Figure 1) and the voltage applied to their terminals. *Id.* at 6:62–7:4. According to the '707 patent, the PM meters voltage V2, which is detected at the terminals of current sensor S, and voltage V1, and derives quantities “such as cost, power and energy . . . through appropriate mathematic elaborations.” *Id.* at 6:62–7:9.

The combination of EP '752 and the '707 patent also teaches that the processor is further configured to determine an operational state of the external electrical device from the sensed power consumption and to terminate the power supplied to the external electrical device when the external electrical device is determined to be in a selected state. *See* Pet. 33–36. EP '752 discloses that sensor 24 “will output a first electrical signal when the presence of an active load is detected and will output a second electrical signal when no active load is detected.” Ex. 1003 ¶ 22. EP '752

also discloses that logical control unit 23 (illustrated in Figure 2) “will receive both signals generated by sensor unit 24 and will react according to its current logical status and according to the logical procedure previously stored in its program memory.” *Id.* ¶ 23. EP ’752 adds that “consequently, [logical control unit 23] could activate or deactivate the switching unit 25 . . . that will connect or disconnect the electric load 2 from the mains power line.” *Id.* The ’707 patent adds the teaching that sensed information from which the operational state of the external electrical device is determined is sensed power consumption. As explained above, the ’707 patent discloses sensing the power consumption of household appliances. The ’707 patent also discloses that “[t]he derived electric quantities, such as cost, power, and energy, are . . . made available to the microcontroller M1 for likely further elaboration.” Ex. 1007, 7:5–9.

Thus, the combination of EP ’752 and the ’707 patent teaches the limitations added by claim 8. Petitioner also provides persuasive reasoning with rational underpinning for combining the teachings of EP ’379, EP ’752, and the ’707 patent as claimed. Pet. 20–25, 54–55. EP ’379, EP ’752, and the ’707 patent all describe power saving devices aimed at addressing the problem of unused household electronic devices wasting power. Ex. 1002, [57], ¶¶ 17, 23, 24; Ex. 1003, [57], ¶¶ 9, 14, 20, 31, 36; Ex. 1007, [57], 6:42–7:9, 7:52–67, 11:52–58, 27:5–18; *KSR*, 550 U.S. at 420 (indicating “any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed”). For example, EP ’379 discloses that “electronic devices widely used in the end-user electronics market consume energy in their standby mode” and that the invention described therein

“provide[s] power saving for electronic devices while such devices are in the standby mode and are not in use.” Ex. 1002 ¶ 2, [57]. Similarly, EP ’752 discloses that an advantage of the device described therein “is the energy saving resulting from the complete disconnection of the electric load from the mains line.” Ex. 1003 ¶ 14. The ’707 patent discloses “monitor[ing] the operation of an electric user” and “realizing a rational management of the consumption of electric energy in a household environment.” Ex. 1007, 7:52–57, 11:52–58. The references also describe devices that include a microprocessor for implementing power saving rules and other rules of operation. Ex. 1002, [57], ¶¶ 17, 23, 24; Ex. 1003 ¶¶ 8, 20, 23, 24, 26, 27, 36; Ex. 1007, 6:28–31, 6:42–7:9, 7:52–57, 11:52–58. The feature of sensing and measuring power consumption—as taught by the combination of EP ’752 and the ’707 patent—merely requires the addition of a power sensor and minor software logic to the teachings of EP ’379, which is in the same field of technology as that of EP ’752 and the ’707 patent. Ex. 1006 ¶¶ 77–84. As Petitioner’s declarant explains, “the home automation system of EP ’379 would incorporate the Hall effect sensor described in [EP ’752] and the power consumption sensor block described in the [’707] patent . . . to monitor and control power consumption and usage by connected devices by turning the devices on/off to conserve energy.” *Id.* ¶ 83. A person of ordinary skill in the art would have been motivated to add sensing and measuring power consumption to the teachings of EP ’379 to provide an intelligent home automation system with additional useful functionality directed to reducing power wastage. Ex. 1006 ¶¶ 77–84.

c. Claim 12

Petitioner contends that the combination of EP '379, EP '752, and the '707 patent teaches the limitations of claim 12. Pet. 3, 36–52. Petitioner generally contends that EP '379 discloses the communication apparatus, electrical inlet, electrical outlet, processor, and device sensor features and that EP '752 and the '707 patent teach the features related to the power sensor. *Id.* at 36–52. Petitioner also provides purported reasoning for combining the teachings of EP '379, EP '752, and the '707 patent as claimed. *Id.* at 20–25, 54–55.

Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 12 is unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379, EP '752, and the '707 patent. *See* Pet. 36–52.

The combination of EP '379, EP '752, and the '707 patent teaches a system for monitoring power consumption of and controlling power supply to a plurality of electrical devices. Ex. 1002, [57], ¶ 9; Ex. 1003 ¶¶ 14, 21, 26; Ex. 1007, Fig. 1, 4:14–27, 5:22–36, 11:52–58, 11:66–12:3.

EP '379 discloses that such a system includes a communication apparatus for communicating with an energy saving device—namely a USB interface, illustrated in annotated Figure 3 below. Ex. 1006 ¶ 88.

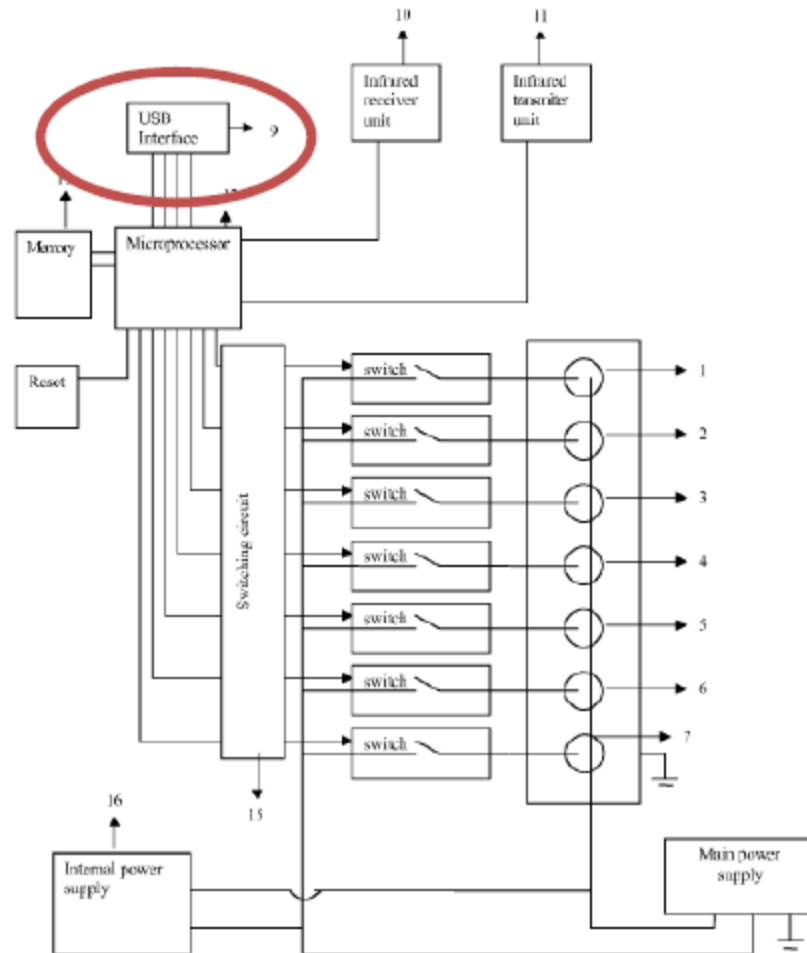


Figure 3

As illustrated above, Petitioner adds a red oval around USB interface 9 of EP '379's controller (energy saving device). Pet 37; Ex. 1002, Fig. 3, ¶ 23. EP '379 explains that "data stored on the internal memory within the controller can be altered by means of the USB bus and the microprocessor in the controller so as to assign new control rules." Ex. 1002 ¶ 23.

In its Preliminary Response, Patent Owner argued that "[e]xternal to the energy saving device, the specification shows a separate communication apparatus for communicating with the energy saving device." Prelim. Resp. 36–38. In distinguishing EP '379, Patent Owner asserted that the USB

interface in EP '379 “is not an apparatus” and “is part of the alleged energy saving device rather than a separate apparatus for communicating with the energy saving device.” *Id.* at 46.

The broadest reasonable interpretation of “communication apparatus” in light of the '099 patent specification includes an interface like USB interface/bus 9 of EP '379. The '099 patent states that “[t]he *means for communicating* with the energy saving device is preferably *a microcomputer communicating via a wired link or a wireless link*, such as low interference potential device (LIPD), Zigbee, or Bluetooth, RS-485 or CAN bus.” Ex. 1001, 4:30–34 (emphases added). Figure 1 of the '099 patent illustrates that energy saving device 12 includes microcomputer 50, which according to the patent “is an integrated system on-chip micro computer providing processing and A/D conversion functions for implementation of energy saving algorithms and *for communication, user interface and associated processing functions.*” *Id.* at Fig. 1, 6:56–60 (emphasis added). Figure 1 also illustrates that energy saving device 12 includes radio frequency (RF) communications interface 58 for wireless communications and serial interface 60 for wired communications. *Id.* at Fig. 1, 7:6–19. Thus, the '099 patent discloses a means for communicating with the energy saving device that is an interface and a microcomputer within the energy saving device itself. EP '379 discloses such a communication apparatus.

EP '379 also discloses that the energy saving device has a single electrical inlet configured to connect to a mains supply electrical outlet. Ex. 1006 ¶ 89. Figure 3 of EP '379 illustrates a single line leading from the main power supply, which is a mains power supply (Ex. 1006 ¶¶ 52, 55, 56, 89), to the input to switches. Ex. 1002, Fig. 3. The mains power supply is

connected to the system through a mains supply electrical outlet and the electrical connection extending between the mains power supply and the switch inputs is a single electrical inlet. See Ex. 1002, Fig. 3, ¶ 23; Ex. 1006 ¶ 89.

EP '379 also discloses that the energy saving device has a plurality of controlled electrical outlets for selectively supplying electrical power to the electrical devices, as illustrated in Figure 3 below. Ex. 1006 ¶ 90.

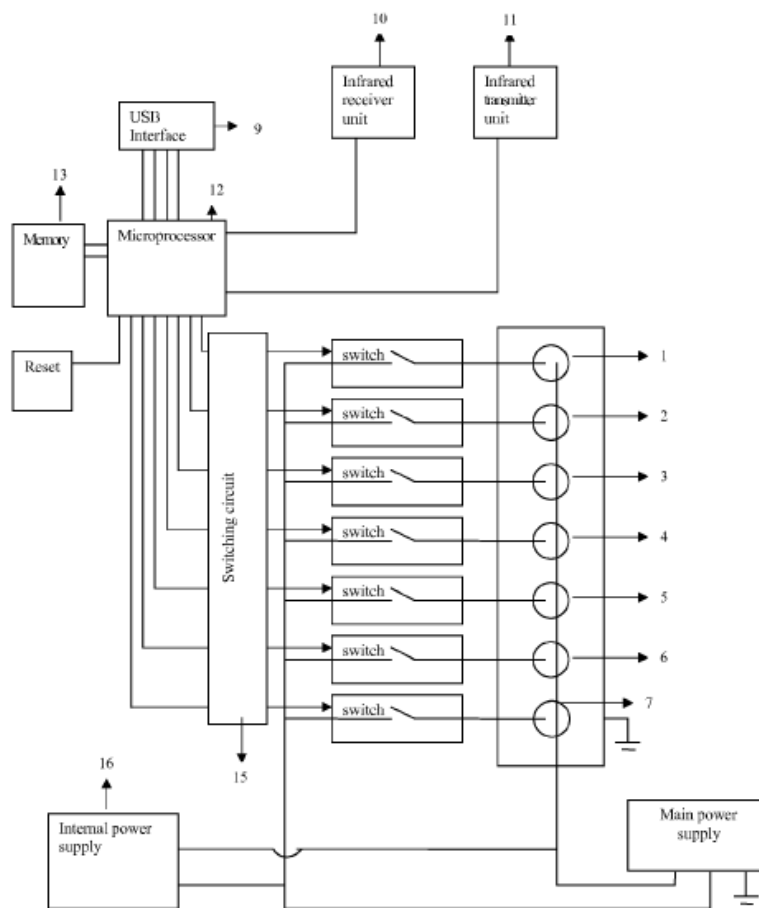


Figure 3

Figure 3 of EP '379 above illustrates seven outputs/plugs for connecting, respectively, to external devices 1–7 (illustrated in Figure 1).

Ex. 1002, Figs. 1, 3, ¶ 21. The external devices include a television, a DVD player, and a Hi-Fi sound system. *Id.* at Figs. 1, 2, ¶ 13. EP '379 states that “the plugs (i.e. wall plugs) to connect . . . electronic devices are placed on [the] controller.” *Id.* ¶ 16. EP '379 also discloses that “the controller may include many power switches (14a-14g) capable to powering on and off the relevant units.” *Id.* ¶ 23. EP '379 discloses that the switches selectively connect the external electrical devices to the input, which is connectable to the main power supply to supply electrical power to the electrical devices, as claimed. *Id.* ¶ 23; Ex. 1006 ¶ 90.

EP '752 and the '707 patent collectively teach that the energy saving device has a power sensor for monitoring power consumption of at least one of the electrical devices connected to the controlled electrical outlets. Ex. 1006 ¶ 91. As explained above in connection with claim 8, EP '752 discloses sensor 24, which “detect[s] the possible presence of an active electric load” connected to the device. Ex. 1003 ¶ 21. Sensor 24 includes a Hall effect sensor that “detect[s] possible variations of the magnetic field produced by the electric current flowing through the wires used to power the electronic load 2.” *Id.* ¶¶ 8, 21, 22, Figs. 2, 3. The '707 patent expressly discloses a power sensor for monitoring power consumption. The '707 patent discloses a power meter (PM), which measures current absorbed by electric users (HA1–HA4 in Figure 1) and the voltage applied to their terminals, and derives quantities “such as cost, power and energy . . . through appropriate mathematic elaborations.” Ex. 1007, 6:62–7:9.

EP '379, EP '752, and the '707 patent collectively teach that the energy saving device has a processor configured to control the connection of electrical supply from the mains supply electrical outlet to each of the

controlled electrical outlets in response to a sensed power consumption state of at least one of the electrical devices. Ex. 1006 ¶ 92. EP '379 discloses a microprocessor that is configured to control the connection of the electrical supply to each of the controlled electrical outlets. Ex. 1002, Fig. 3, ¶¶ 23, 24, 26. Figure 3 of EP '379, below with annotations added by Petitioner, illustrates the connection of microprocessor 12 to the switching circuit, which controls the switches, which in turn control the connection of the electrical supply to the controlled electrical outlets.

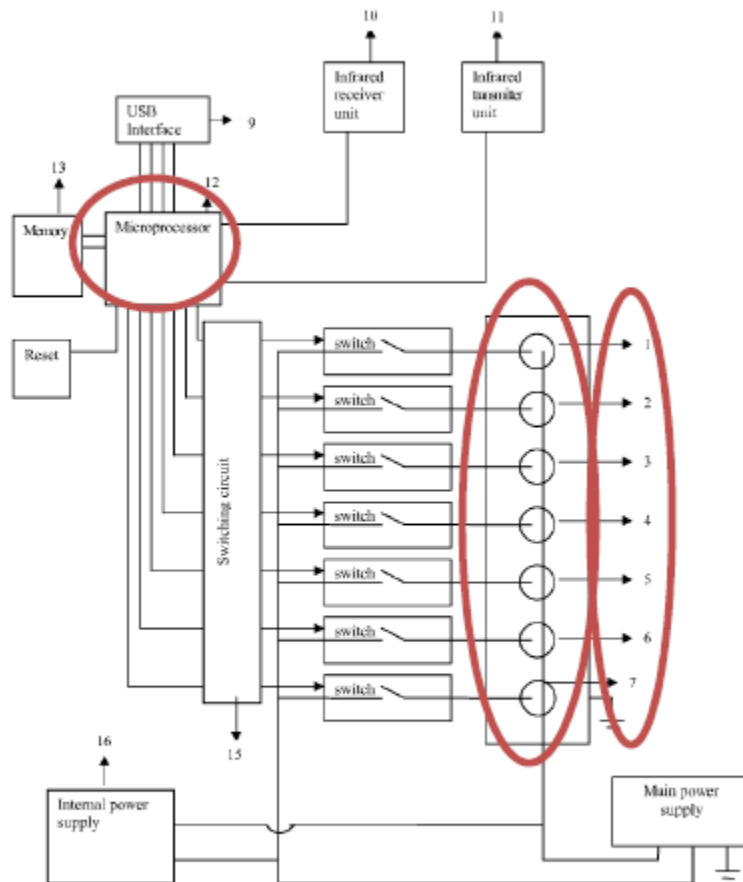


Figure 3

In the annotated Figure 3 above, Petitioner adds red ovals to identify the processor, electrical outlets, and electrical devices 1–7. Pet. 45; Ex. 1002,

Fig. 3. EP '379 discloses that the microprocessor controls the switches to control the electrical supply connection to the devices connected to the electrical outlets. Ex. 1002 ¶¶ 23, 24, 26. EP '752 and the '707 patent provide the added teachings of controlling the electrical connection “in response to a sensed power consumption state of at least one of the electrical devices.” EP '752 discloses an integrated circuit IC2 that is programmed to detect whether a device is either on or off and to turn the power to the device on or off depending on the device power state and a programmed rule. Ex. 1003 ¶¶ 22, 23. Specifically, EP '752 discloses that “programmable logical control unit 23 [illustrated in Figure 2] is used to control the operation” of the energy saving device and that “control unit 23 is based on a microprocessor device that, in [Figure 3] is shown as IC2.” *Id.* ¶ 20. As explained above in connection with claim 8, EP '752 discloses that logical control unit 23 “will receive both signals generated by sensor unit 24 and will react according to its current logical status and according to the logical procedure previously stored in its program memory.” *Id.* ¶ 23. EP '752 adds that “consequently, [logical control unit 23] could activate or deactivate the switching unit 25 . . . that will connect or disconnect the electric load 2 from the mains power line.” *Id.*

The '707 patent similarly discloses that the MSA includes microcontroller M1 (as illustrated in Figure 2) and that the MSA “is capable of measuring at least one among the various electric quantities (current, voltage, power factor, power, energy) being associated to the operation of the electric users HA1–HA4 and to communicate [the] result of the measure to the microcontroller.” Ex. 1007, Fig. 2, 7:35–40. The '707 patent discloses that “through an appropriate software of the microcontroller,” the

electric quantities are compared “with reference profiles being representative of normal operating conditions of the electric user.” *Id.* at 7:58–63. The ’707 patent also describes “interrupt[ing] the flow of electric current to the electric user . . . should it be required in order to avoid exceeding the limit of the contractual power.” *Id.* at 27:5–14.

Finally, EP ’379 teaches a device sensor for monitoring output of a remote control device, said device sensor being coupled to the device processor, and wherein the device processor operates to terminate the power supplied to the external electrical device based upon the absence of the detection of output of the remote control device by the sensor. Ex. 1006 ¶ 93. EP ’379 discloses that the controller includes infrared receiver unit 10 (illustrated in Figure 3), which is coupled to microprocessor 12 and which monitors remote control device signals. Ex. 1002 ¶¶ 23, 24; Ex. 1006 ¶ 93. EP ’379 also discloses terminating the power supplied to an external electrical device when wireless output signals from a remote control are not detected for greater than a predetermined time-out period, such as three hours. Specifically, EP ’379 discloses the following:

The controller can be set to a predetermined time period in order to save power, and *if no signal is received within this time period from a remote control of any device connected to it, the controller can turn OFF such devices in turn or at the same time according to a predetermined power saving rule.*

Ex. 1002 ¶ 26 (emphases added). EP ’379 also discloses an example in which the controller “completely interrupt[s] the power” of a television in standby mode “after a short period of time.” *Id.* ¶ 19. EP ’379 explains:

The signals used to control the electronic devices are also sensed by the controller. The controlling unit is designed so as to individually or collectively interrupt the power of electronic

device(s) connected to it. Turning back to this example, after the television is switched to the standby mode by the user, *the power of the television system is completely interrupted, with the controller sending the same signal and executing a pre-determined shutting-down rule.*

Id. (emphasis added).

Thus, the combination of EP '379, EP '752, and the '707 patent teaches the limitations of claim 12. In addition, for the reasons explained above in connection with claim 8 which likewise recites features directed to a power sensor, Petitioner provides persuasive reasoning with rational underpinning for combining the teachings of EP '379, EP '752, and the '707 patent as claimed. *See supra* Section II.E.2.c.

d. Claim 13

Claim 13 depends from claim 12 and adds limitations directed to an input, an output, a device processor, and a device sensor. The “device sensor” limitation of claim 13 is identical to the “device sensor” limitation of claim 12. Petitioner contends that the combination of EP '379, EP '752, and the '707 patent teaches the limitations of claim 13. Pet. 3, 61–52. Petitioner generally contends that EP '379 discloses the communication apparatus, electrical inlet, electrical outlet, processor, and device sensor features and that EP '752 and the '707 patent teach the features related to the power sensor. *Id.* at 36–52. Petitioner also provides purported reasoning for combining the teachings of EP '379, EP '752, and the '707 patent as claimed. *Id.* at 20–25, 54–55.

Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 13 is unpatentable under 35 U.S.C. § 103(a) as obvious

over EP '379, EP '752, and the '707 patent. *See* Pet. 36–52. As explained above, the subject matter of claim 12 would have been obvious over EP '379, EP '752, and the '707 patent. *See supra* Section II.E.2.c. In addition, for the reasons explained above in connection with claim 8, EP '379 discloses that each of the energy saving devices⁷ includes the input, output, device processor, and device sensor recited in claim 13. *See supra* Section II.E.2.b. Moreover, for the reasons explained above in connection with claim 8, one of ordinary skill in the art would have been motivated to combine the teachings of EP '379, EP '752, and the '707 patent in the manner claimed. *See supra* Section II.E.2.b.

e. Claims 14–16

Claim 14 recites “[t]he system of claim 12 further comprising an output for outputting data relating to the monitored power consumption.” Claim 15 depends from claim 14 and adds “wherein the processor is configured to control power supply to the electrical devices in response to the data output relating to monitored power consumption.” Claim 16 depends from claim 14 and adds “wherein the processor is configured to provide adjustment settings of the energy saving device in response to the data output relating to monitored power consumption.”

Petitioner contends that EP '752 and the '707 patent teach the features added by claims 14 and 15. Pet. 53, 55–61. Petitioner also contends that EP '379, EP '752, and the '707 patent teach the feature added by claim 16. *Id.* at 62–67. Having reviewed the Petition and the evidence discussed therein, we determine that Petitioner has demonstrated by a preponderance

⁷ We note that claim 12, from which claim 13 depends and derives antecedent support, recites a single “energy saving device.”

of the evidence that claims 14–16 are unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379, EP '752, and the '707 patent.

As explained above, the subject matter of claim 12 would have been obvious over EP '379, EP '752, and the '707 patent. *See supra* Section II.E.2.c. The references also collectively teach that the system includes an output for outputting data relating to the monitored power consumption. EP '752 discloses that “[s]ensor unit 24 will *output* a first electrical signal when the presence of an active load is detected and will *output* a second electrical signal when no active load is detected.” Ex. 1003 ¶ 22 (emphases added). The '707 patent similarly discloses outputting the data relating to the monitored power consumption. As illustrated in Figure 2 of the '707 patent, the power meter PM of the MSA is connected to the microcontroller M1, which in turn is connected to the memory MEM. Ex. 1007, Fig. 2. The '707 patent discloses that microcontroller M1 “stores all information obtained from the study of the trends of one or more electric quantities associated to the operation of the electric user HA, as detected by the metering block PM (Power Meter).” *Id.* at 6:35–41. The '707 patent also discloses that “the device MSA is capable of measuring at least one among the various electric quantities (current, voltage, power factor, power, energy) being associated to the operation of the electric users HA1–HA4 and to communicate [the] result of the measure to the microcontroller.” *Id.* at 7:35–40.

The references also collectively teach that the processor is configured to control power supply to the electrical devices in response to the data output relating to monitored power consumption. Ex. 1006 ¶¶ 92, 101, 102. As explained above in connection with claim 12, EP '752 discloses that logical control unit 23 “will receive both signals generated by sensor unit 24

and will react according to its current logical status and according to the logical procedure previously stored in its program memory and, consequently, it could activate or deactivate the switching unit 25 . . . that will connect or disconnect the electric load 2 from the mains power line.” Ex. 1003 ¶ 23. The ’707 patent adds the express disclosure of the output data being related to monitored power consumption. Ex. 1007, 7:35–67, 11:46–58, 26:66–27:18.

The references also collectively teach that the processor is configured to provide adjustment setting of the energy saving device in response to the data output relating to monitored power consumption. EP ’379 discloses that “the data stored on the internal memory within the controller can be altered by means of the USB bus and the microprocessor in the controller so as to assign new control rules.” Ex. 1002 ¶ 23. EP ’379 also discloses that “[i]f no remote control signal is received[,] the power saving rule to be executed may be a predetermined rule by the manufacturer, and may be altered by means of the data bus (9) on the controller by the user or manufacturer, and according to the power saving rules, a device can either be turned off[] or switched to the standby mode.” *Id.* ¶ 26. As Petitioner’s declarant states, one of ordinary skill in the art would have combined the teachings of EP ’379 of adjusting parameters via the bus (USB interface) with the teachings of EP ’752 of monitoring and outputting data related to power consumption “to allow for updated deactivation protocols in response to the data output relating to monitored power consumption.” Ex. 1006 ¶ 103 (citing, e.g., Ex. 1002 ¶ 23; Ex. 1003 ¶ 34). For example, in making such a combination, one of the parameters disclosed in EP ’752—the predetermined delay—could have been adjusted. *Id.*; Ex. 1003 ¶ 34.

In addition, for the reasons explained above in connection with claim 8 which likewise recites features directed to a power sensor, Petitioner provides persuasive reasoning with rational underpinning for combining the teachings of EP '379, EP '752, and the '707 patent in the manner recited in claims 14–16. *See supra* Section II.E.2.b.

In light of the foregoing, a preponderance of the evidence shows that the subject matter of claims 14–16 would have been obvious to one of ordinary skill in the art in view of EP '379, EP '752, and the '707 patent.

III. CONCLUSION

Based on the evidence and arguments, Petitioner has demonstrated by a preponderance of the evidence that (i) claim 10 of the '099 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379 and the '707 patent, and (ii) claims 8 and 11–16 of the '099 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over EP '379, EP '752, and the '707 patent.

IV. ORDER

Accordingly, it is

ORDERED that claims 8 and 10–16 of U.S. Patent No. 9,106,099 B2 have been shown to be unpatentable;

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

IPR2017-00839
Patent 9,106,099 B2

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