Unified Patent Court
Einheitliches Patentgericht
Juridiction unifiée du brevet

Düsseldorf local division
UPC_CFI_459/2023

Decision
of the Court of First Instance of the Unified Patent Court
issued on 7 March 2025
concerning EP 2 011 218 B1

LEADERSHIPS:

New attacks on the legal position that are only made are not to be taken into account. Strategic tactics aimed at achieving surprise effects are alien to the Rules of Procedure.during the oral proceedings

KEYWORDS:

Rejection of belated submissions, amendment of claim

KLÄGERIN:

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DEFENDANT:

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PATENT AT ISSUE: European Patent No. EP 2 011 218 B1

Panel/Chamber: Panel of the Düsseldorf local division

Participating judges:

The decision is announced with the participation of the legally qualified judge Dr Thom as rapporteur, the presiding judge Klepsch, the legally qualified judge Aergaard and the technically qualified judge Schober.

Language of the proceedings: German

Subject matter: Action for infringement and action for annulment

Oral hearing: 17 January 2025

Brief description of the facts:

The plaintiff is the proprietor of European patent 2 011 218 (Annex K2; hereinafter: patent in dispute), which was filed as an international application on 20 April 2007, claiming the priority of German patent application 10 2006 018 576 of 21 April 2006. Publication of the patent grant by the European Patent Office took place on 21 September 2016. The patent in dispute is in force.

The patent in suit relates to a boost converter power factor correction circuit (boost PFC). Claims 7 to 10 in dispute here read as follows.

Claim 7

"A boost power factor correction circuit (boost PFC), the circuit a freewheeling diode comprising , (D1), a charging coil (L1) , connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an electronic control and/or regulating unitwherein the charging capacitor (C1) is , wherein charged by the controlled switch (M1) with a discharge current generated by the charging coil (L1)the switch (M1) can be switched on and off by the electronic control and/or regulating unit,

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects the current through the switch (M1) during periods in which the switch (M1) is closed, and
- detects in a further operating parameter of the boost PFC circuit in time durations which the switch (M1) is open, the detected further operating parameter being the zero crossing of the current flowing through the charging coil (L1), and

that the circuit further comprises current flowing (L1)."a decoupling element for decoupling the detection of the switching current and detection of the zero crossing of the through the charging coil

Claim 8

Circuit according to claim 7, wherein the zero crossing of the through the charging coil (L1) current flowing is detected electrically isolated, in particular inductively.

Claim 9

Circuit according to claim 7 or 8, wherein the control and regulation unit switches the switch (M1) on again at the time of zero passage of the current through the charging coil (L1).

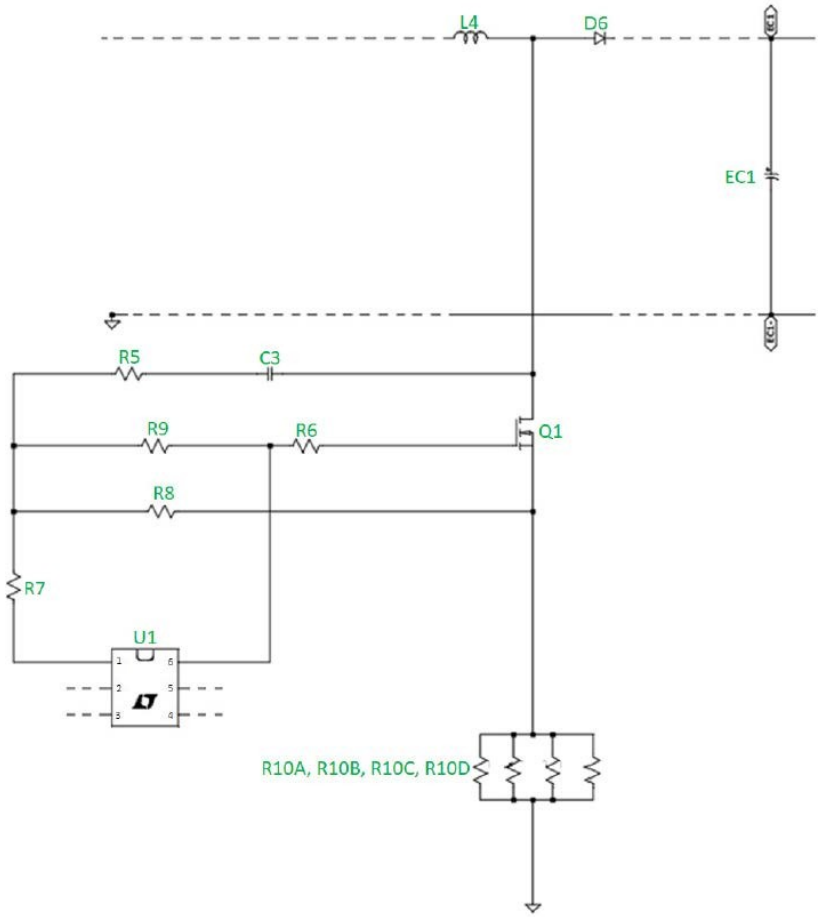
Claim 10

Circuit according to one of claims 7-9, wherein the current through the switch (M1) or a variable representative thereof is compared with a threshold value and the switch (M1) is switched off again as soon as the threshold value is .reached or exceeded

Defendant 1) is a Chinese company with its registered office in Shenzhen. Defendant 2) is a German GmbH with its registered office in Hemer. Both defendants are together under "Headquarters" on the website www.cupower.com.

The defendants offer and in any case defendant 2) sells LED drivers and France in Germany which a boost PFC circuit, in particular drivers with the type designation ID LCCB 100/230/250-700 NFC FV 1 (hereinafter: the attacked embodiment; see Annexes K9, K10).

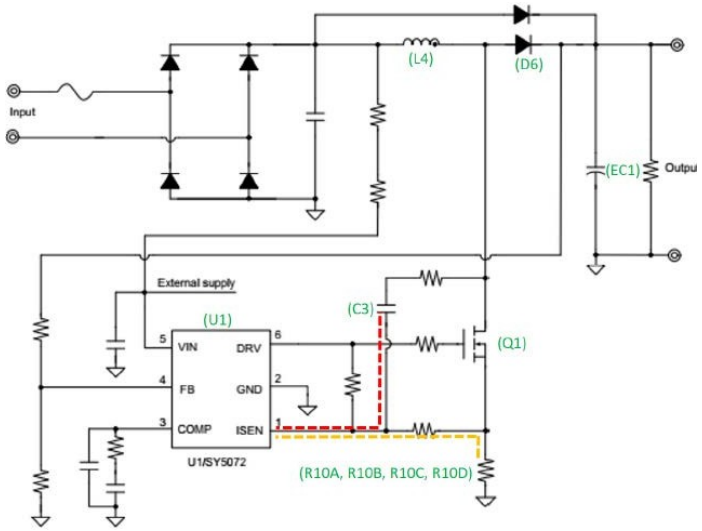
The contested embodiment has a boost PFC circuit with the following structure (see Appendix K 13):



The attacked embodiment the following components: Charging coil (L4), freewheeling diode (D6), charging capacitor (EC1), transistor (Q1), current measuring resistor (R10A/B/C/D) and capacitor (C3).

The order and wiring of the above components and the connection of both the con-

densator (C3) as well as the current measuring resistor (R10A/B/C/D) with pin 1 of the ASIC (U1) corresponds to the following figure, which from originates the of the manufacturer Silergy for the ASIC with the type designation SY5072 controlling the boost PFC of the attacked embodiment (Annex K 12, Figure 1), whereby the coloured references were added by the plaintiff.application description



A DC voltage to the charging coil (L4) connected to the receipt of the boost PFC circuit. or a rectified AC voltage is appliedThis charging coil (L4) is connected on the output side both to the freewheeling diode (D6) and, via the transistor (Q1) serving as a switch, to the current measuring resistor (R10A/B/C/D). The output of the freewheeling diode (D6) is connected to at a a charging capacitor (EC1) connected to earth marks the output of the boost PFC circuit.connection point that also

The applicant has further submitted as Figures 12, 13 and Figure 14, in which the order of the pins of switch Q1 are numbered slightly differently.illustrations of the circuits of the contested embodiments

Figure 12, in which, according to the applicant, the dashed line shows the connection of charging coil L4, freewheeling diode D6, charging capacitor EC1, transistor Q1 and shunt R10A/B/C/D:

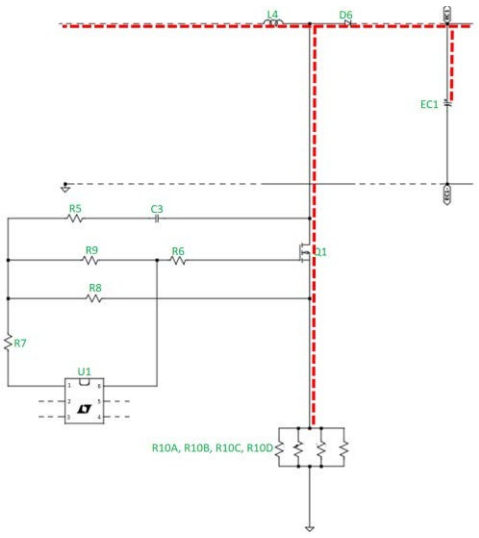


Figure 13, in which, according to the applicant, the dashed line shows the control of the transistor Q1 by the ASIC (U1).

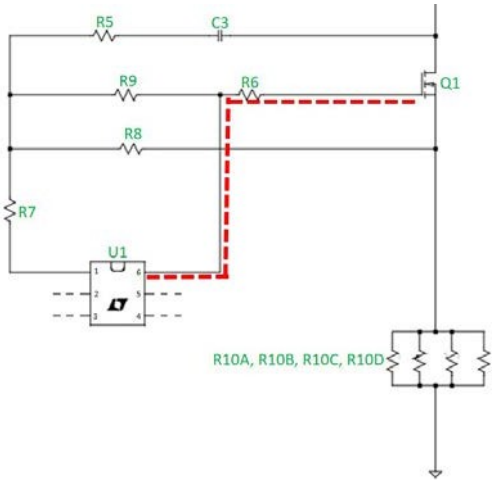
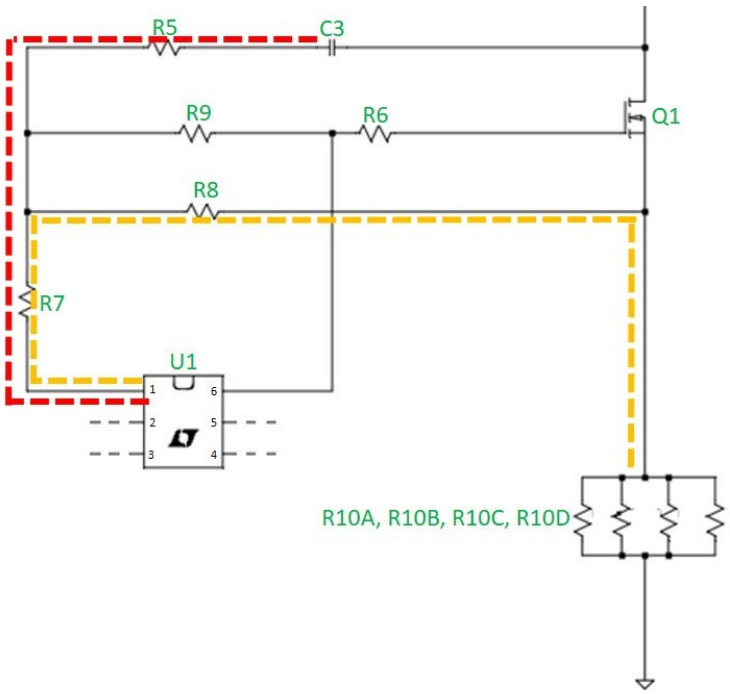
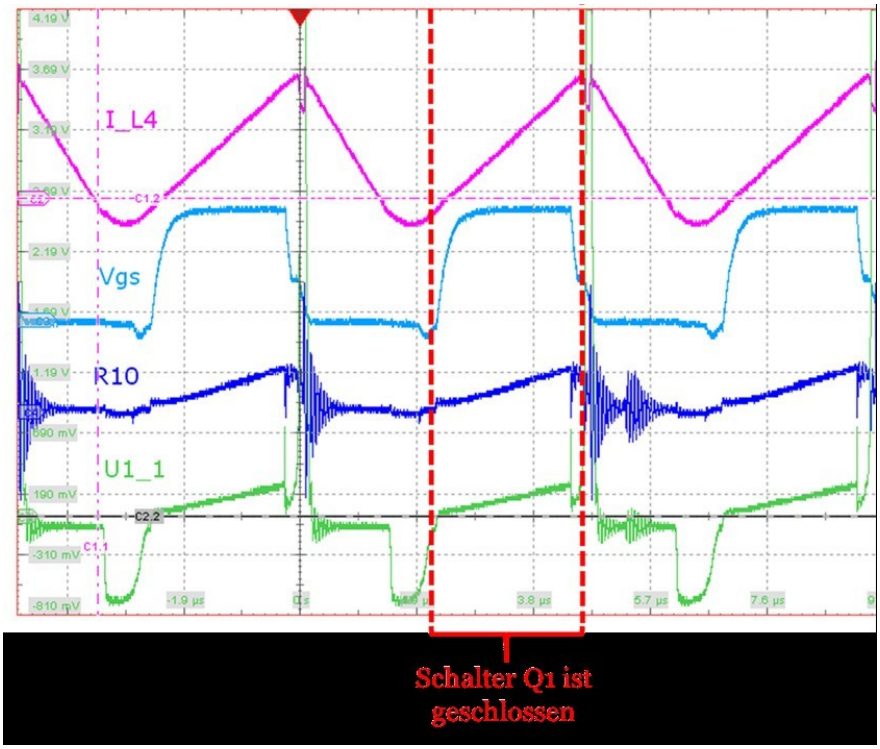


Figure 14 shows the connections of pin 1 of the ASIC U1 to on the one hand the capacitor C3 and to a connection point between the transistor Q1 and the on the othercurrent measuring resistor R10A/B/C/D . On the other side (not shown), the capacitor C3 connected to a connection point between the charging coil L4 and the freewheeling diode D6.is



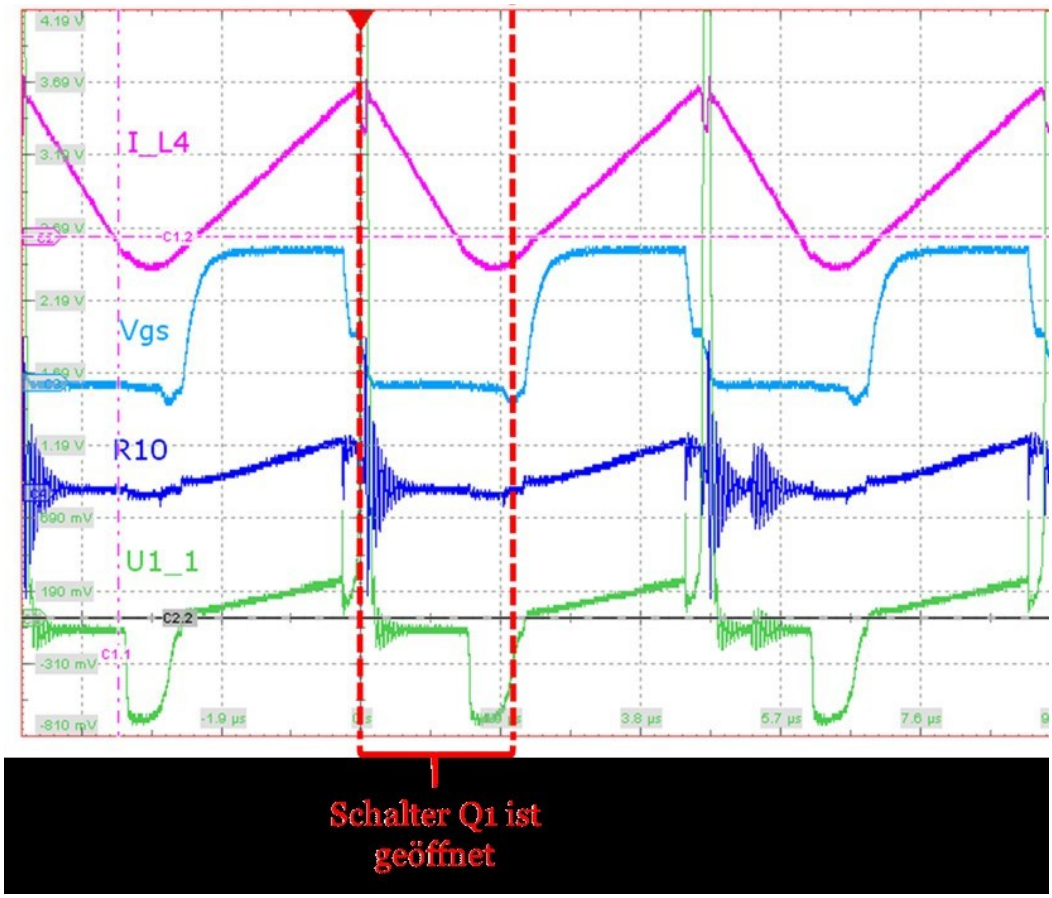
The plaintiff both voltage and current curves during operation of the boost PFC circuit of the measured . contested embodimentThe following three figures (Figures 15, 16 and 17) are taken from Exhibit K11 and were edited by the applicant by highlighting areas of the closed and open switch Q1.

Figure 15:



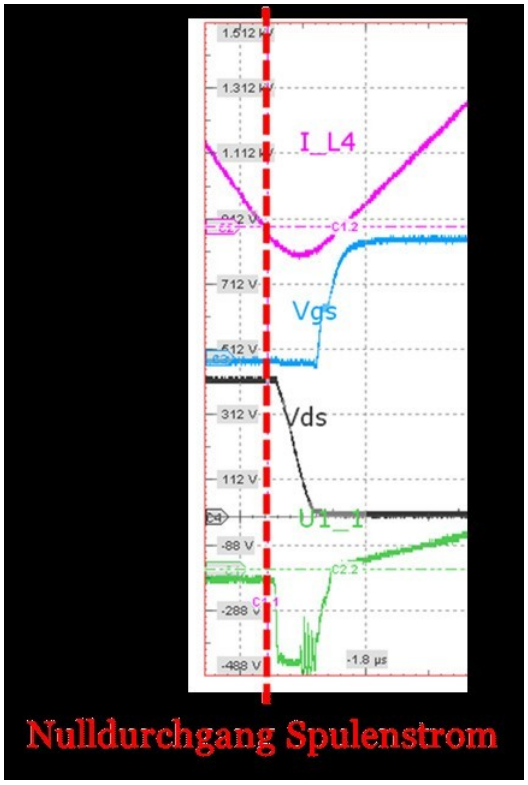
The current flowing through the closed switch Q1 charges the charging coil L4 (the by the pink coil current represented curve "I_L4" increases). linearlyThe voltage at the current measuring resistor (R10A/B/C/D) also increases linearly current flowing through switch Q1 (dark blue curve "R10"). Due to the connection between the current measuring resistor R10A/B/C/D and pin 1 of the ASIC (U1), the measuring signal representing the current flow is at the due to the increasing present measuring input pin 1 of the ASIC (U1) (green curve "U1_1"). The voltage rise at pin 1 essentially corresponds to that at the current measuring resistor (see the parallel rise of dark blue curve "R10" and green curve "U1_1").

Figure 16:



If the current flowing through switch Q1 (represented by the dark blue curve
"R10") reaches a certain value, the ASIC U1 interrupts the voltage signal applied to the gate of the switch Q1 and thus opens the switch Q1. The charging coil L4 discharges via the now conducting freewheeling diode D6 (the coil current represented by the pink curve "I_L4" decreases slightly). As no more current flows through the open switch Q1, the voltage at the current measuring resistor drops R10A/B/C/D (dark blue curve "R10") and with it the measurement signal representing the current flow at the measurement input pin 1 of the ASIC U1 (green curve "U1_1").

Figure 17:



If the current flowing through the charging coil L4 reaches the zero crossing, the the measuring input pin voltage signal (green curve "U1_1") a spontaneous negative at1 of the ASIC U1 peak. In particular, the voltage Vds applied C3 to capacitor drops abruptly the switch current I_L4 reaches zero crossing, which causes the voltage signal (voltage drop) to be transferred through capacitor C3 to ASIC U1.when

For the other measurement diagrams, please to Appendix K 11. They show that the freewheeling diode blocks when the switch is closed and therefore no current flows and the charging capacitor EC1 or that when the switch is open, the final charging current of the charging coil L4 flows into the charging capacitor EC1 via the freewheeling diode and charges it.between the freewheeling diode D6

In their counterclaimthat , the defendants request the patent in suit be cancelled with effect for all contracting states of the Agreement on a Unified Patent Court (UPCA) in which the patent in suit has , effectto extent of theclaims 7 to 10. The plaintiff defends the patent in suit, in the alternative formulating an amended version in seven auxiliary requests.

To avoid repetition, reference is also made to the entire contents of the file.

Applications by the parties:

I. It is noted that

the defendants infringe EP 2 011 218 B1 if they offer, place on the market or use or import or possess them for the aforementioned purposes,boost power factor correction circuits (boost PFC) in Germany or France

if the circuit has unita freewheeling diode, a charging coil connected in series with the freewheeling diode, a switch, a charging capacitor and an electronic control and/or regulating , in which case the switch can be switched on and off by the electronic control and/or regulating unit, and, the charging capacitor being charged by the controlled switch with a by discharging current generated the charging coil

if the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects in which the current through the switch in time durations the switch is closed, and
- detects a further operating parameter of the BoostPFC circuit in time durations in which the switch is open, the detected further operating parameter being the zero crossing of the current flowing through the charging coil, and

the circuit further comprises a decoupling element for decoupling the detection of the switching current and the detection of the zero crossing of the current flowing through the charging coil.

[Claim 7]

II. The defendants are ordered to refrain from offering, placing on the market or using or importing or them for the aforementioned purposesboost power factor correction circuits (boost PFCs) in Germany or France possessing ,

if the circuit has a freewheeling diode, a charging coil connected in series with the freewheeling diode, a switch, a charging capacitor and an electronic control and/or regulating unit, the charging capacitor being charged by the controlled switch with a discharging current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, and

if the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects in which the current through the switch in time durations the switch is closed, and
- detects a further operating parameter of the BoostPFC circuit in time durations in which the switch is open, the detected further operating parameter being the zero crossing of the current flowing through the charging coil, and

the circuit further comprises a decoupling element for decoupling the detection of the switching current and the detection of the zero crossing of the current flowing through the charging coil,

[Claim 7]

III. The defendants are ordered to provide the plaintiff , in an orderly with informationand comprehensible list, on the extent to which they have committed the acts referred to in point IIsince 21 September 2016, stating

1. the origin and distribution channels of the infringing products,

2. the quantities delivered, received or ordered and the prices paid for the infringing products, and

3. the identity of all third parties involved products, whereby the defendants to prove the information in the production or distribution of infringing must submit copies of invoices, or alternatively delivery notes, , whereby requiring secrecy the corresponding proof of purchase, namely in accordance with III.1. to III.3. abovedetails outside the data to be disclosed may be blacked out.

IV. The defendants are ordered to provide the plaintiff with an orderly and comprehensible statement of the extent to which they the to in section have committed acts referred II since 21 September 2016, stating

1. of the individual deliveries, itemised according to delivery quantities, delivery times, delivery prices and type designations as well as the names and addresses of the commercial customers,

2. of the individual offers, broken down by offer quantities, offer times, offer prices and type designations as well as the names and addresses of the commercial offerees,

3. of the advertising operated, broken down by advertising media, their circulation figures, distribution period and distribution area,

4. the prime costs broken down by the individual cost factors and the profit realised.

V. The defendants are ordered to surrender to a bailiff to be appointed by the plaintiff for the purpose of destruction at their, the defendants', expense products referred to in II. above which are indirect possession or ownership.the in their direct or

VI. The defendants are ordered to recall with reference to the patent-infringing status of the goods established by the court (UPC Agreement judgment of ...) and with the binding undertaking to reimburse any fees and any necessary packaging and transport costs as well as with the return the products referred to , which been since in section IIhaveplaced on the market 21 September 2016, from the commercial customers to bear customs and storage costs associated and to back the products.

VII. In the event of infringement of the convictions under II, III, IV, V or VI, the defendants obliged to pay the court for each case of infringement.are a penalty payment of up to EUR 250,000

VIII. It is established that the defendants are jointly and severally liable to compensate the plaintiff for all damages in excess of the provisional damages pursuant to section IX. that she a result of has suffered and will suffer asacts committed .the in described section II. since 21 September 2016

IX. The defendants are ordered as joint and several debtors to pay the plaintiff provisional damages in the amount of EUR 46,000.00.

X. Orders the defendants to pay the costs of the proceedings and the other costs incurred by the plaintiff.

XI. Should the court make dependent on the security by the plaintiff, the plaintiff requests that the following partial securities be set:the enforcement of this judgement provision of

Section II (omission) EUR Section IV

(information) EUR 25,000350,000

Clause V. (Invoicing) EUR Clause VI.

(Destruction) EUR 50,000 Clause VII.

(Recall) EUR 50,00025,000

The plaintiff further requests that the court order court to pay ,the the

amount in with section damages damages)accordanceIX (preliminary

Dismiss defendant's auxiliary motions the relating to the submission of documents and the accounting application;

the applicant further requests in the alternative

that auxiliary request 1:

I. declare that the defendants infringe EP 2 011 218 B1 if they offer, place on the market or use, or import or possess for the said purposes, boost power factor correction circuits (boost PFC) in Germany or France, if the circuit , whereby a discharge current generated by comprises a freewheeling diode, a with the the charging coil charges the charging coil , charging capacitor and an electronic control and/or regulating unitcharging capacitorconnected in series freewheeling diodea switch, a , a charging capacitor and an electronic control and/or regulating the charging capacitor is charged by a discharge current generated by the charging coil through the controlled switch, wherein the switch can be switched on and off by the electronic control and/or regulating unit, and wherein the electronic control and/or regulating unit is connected at a receipt to the charging capacitor.unit, wherein

- directly or indirectly detects and measures when the switch is closed, andthe current through the switch during periods

- detecting time periods and measuring a further operating parameter of the boost PFC circuit in in which the switch is open, wherein the detected and measured further operating parameter is current flowing load coil, andthe zero crossing of the through the

the circuit further comprises a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 1 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using boost power factor correction circuits (boost PFC) in Germany or France, or importing or possessing them for the aforementioned purposes, if the circuit comprises a freewheeling diode, a charging coil connected in series with the freewheeling diode, a switch, a charging capacitor and an electronic control and/or regulation unit, a charging capacitor and an electronic control and/or regulating unit, wherein the charging capacitor is charged by the controlled switch with a discharge current generated by the charging coil, wherein the switch can be switched on and off by the electronic control and/or regulating unit, and wherein the electronic control and/or regulating unit is connected at a receipt of the charging capacitor.

- directly or indirectly detects and measures when the switch is closed, andthe current through the switch during periods

- detecting time periods and measuring a further operating parameter of the boost PFC circuit in in which the switch is open, wherein the detected and measured further operating parameter is current flowing load coil, andthe zero crossing of the through the

the circuit further comprises a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 1 of the application to amend the patent in suit]

Auxiliary request 2:

I. It is declared that the defendants infringe EP 2 011 218 B1 if they boost power factor correction circuits (boost PFC) in Germany or France offer, place on the market or use or import or possess them for purposes,the aforementioned

if the circuit comprises regulating unit, .a free-wheeling diode, a in series with the free-wheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or charging coilwherein a is used to charge the discharge signal generated by the charging coil

charging capacitor charging capacitor, the charging capacitor is charged is charged by by the the controlled controlled switchswitch, whereby the switch can switched on and off by the electronic control and/or regulating unit, .and when the electronic control and/or regulating unit is connected to an the input of

- directly or indirectly the current through the switch detects periods when the switch is closed, and

- detecting in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in time periods

the circuit further comprises current flowing .a decoupling element for capacitively decoupling the detection of the switch current and the detection of the zero crossing of the through the charging coil

[Claim 7 as amended by auxiliary request 2 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using or importing or them for the aforementioned purposesboost power factor correction circuits (boost PFCs) in Germany or France possessing ,

if the circuit a freewheeling diode, a charging coil connected in series with the freewheeling diode, a switch, a charging capacitor and an electronic control and/or has regulating the charging capacitor is charged by the controlled switch discharge current , wherein the switch can be switched on and off by the electronic control and/or regulating unit, and wherein the electronic control and/or regulating unit is connected at a receipt of the charging capacitor.unit, wherein with a generated by the charging coil

- directly or indirectly the current through the switch detects periods when the switch is closed, and

- detecting in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in time periods

the circuit further comprises current flowing .a decoupling element for capacitively decoupling the detection of the switch current and the detection of the zero crossing of the through the charging coil

[Claim 7 as amended by auxiliary request 2 of the application to amend the patent in suit]

Auxiliary request 3:

I. It is declared that the defendants infringe EP 2 011 218 B1 if they in Germany or France, , boost power factor correction circuits (boost PFC), offer, place on the market or use or import or possess for the said purposes.if the circuit comprises a freewheeling diode, a charging coil connected in series freewheeling diode, a switch, a charging capacitor and a charging capacitorwith the

has an electronic control and/or regulating charging capacitor is charged , wherein the switch can be switched on and off by the electronic control and/or regulating unit, and when the electronic control and/or regulating unit is connected to a receipt of the charging capacitor, the charging capacitor charged .unit, wherein the is by by the the controlled controlled switch switchwith a discharge current generated by the charging coil

- via a measuring resistor (R1) connected in series with the switch (M1), detects the current through the switch during periods in which the switch is closed, and

- detecting in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in time periods

the circuit further comprises a decoupling element for decoupling the detection of the switching current and the detection of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 3 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using , or importing or possessing them for the aforementioned purposes, boost power factor correction circuits (boost PFC) in Germany or Franceif the circuit comprises a freewheeling diode, a charging coil connected , a switch, a charging capacitor and an electronic control and/or regulating unit, a charging capacitor and an electronic control in series with the freewheeling diodeand/or regulating control and/or regulating unit is connected at unit, wherein the charging capacitor is charged by the controlled switch discharge current generated , wherein the switch can be switched on and off by the electronic control and/or regulating unit, and the charging capacitor.with a by the charging coilwherein the electronic a receipt of

- via a measuring resistor (R1) connected in series with the switch (M1), detects the current through the switch during periods in which the switch is closed, and

- detecting in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in time periods

the circuit further comprises a decoupling element for decoupling the detection of the switching current and the detection of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 3 of the application to amend the patent in suit]

Auxiliary request 4:

I. It is established that the defendants infringe EP 2 011 218 B1 if they use boost power factor correction circuits (boost PFC), in Germany or in other countries.

offer, place on the market or use in France, or import or possess forpurposes, the aforementioned

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- directly or indirectly detects and measures when the switch is closed, andthe current through the switch during periods

- detecting and measuring time durations in which the switch is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in

the circuit further comprises zero crossing of the current flowing through the charging coil.a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the

[Claim 7 as amended by auxiliary request 4 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using or importing or them for the aforementioned purposesboost power factor correction circuits (boost PFCs) in Germany or France possessing ,

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- directly or indirectly detects and measures when the switch is closed, andthe current through the switch during periods

- detecting and measuring time durations in which the switch is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in

the circuit further comprises a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 4 of the application to amend the patent in suit]

Auxiliary request 5:

I. It is declared that the defendants infringe EP 2 011 218 B1 if they boost power factor correction circuits (boost PFC) in Germany or France offer, place on the market or use or import or possess them for purposes,the aforementioned

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- via a measuring resistor (R1) connected in series with the switch (M1), detects and measures the current through the switch during periods in which the switch is closed, and

- detecting and measuring time durations in which the switch is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in

the circuit further comprises a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 5 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using or importing or them for the aforementioned purposesboost power factor correction circuits (boost PFCs) in Germany or France possessing ,

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- via a measuring resistor (R1) connected in series with the switch (M1), detects and measures the current through the switch during periods in which the switch is closed, and

- another operating parameter of the boost PFC circuit is recorded in durations

and measured when the switch is open, wherein the other operating parameter sensed and measured is the zero crossing of the current flowing through the charging coil, and

the circuit further comprises a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 5 of the application to amend the patent in suit]

Auxiliary request 6:

I. It is declared that the defendants infringe EP 2 011 218 B1 if they boost power factor correction circuits (boost PFC) in Germany or France offer, place on the market or use or import or possess them for purposes,the aforementioned

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- via a measuring resistor (R1) connected in series with the switch (M1), detects the current through the switch during periods in which the switch is closed, and

- detecting of the boost PFC circuit in time periods a further operating parameter in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, and

the circuit further comprises current flowing .a decoupling element for capacitively decoupling the detection of the switch current and the detection of the zero crossing of the through the charging coil

[Claim 7 as amended by auxiliary request 6 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using or importing or them for the aforementioned purposesboost power factor correction circuits (boost PFCs) in Germany or France possessing ,

if the circuit a comprises unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or regulating regulating unitwherein the charging capacitor charged by the controlled switch with a discharging current generated by the charging coil, .whereby the switch is switched on and off by the electronic control and/or

can be switched, and if the electronic control and/or regulation unit is connected to an input

- via a measuring resistor (R1) connected in series with the switch (M1), detects the current through the switch during periods in which the switch is closed, and

- detecting in which the switch is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in time periods

the circuit further comprises current flowing .a decoupling element for capacitively decoupling the detection of the switch current and the detection of the zero crossing of the through the charging coil

[Claim 7 as amended by auxiliary request 6 of the application to amend the patent in suit]

Auxiliary request 7:

I. It is declared that the defendants infringe EP 2 011 218 B1 if they boost power factor correction circuits (boost PFC) in Germany or France offer, place on the market or use or import or possess them for purposes,the aforementioned

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- via a measuring resistor (R1) connected in series with the switch (M1), detects and measures the current through the switch during periods in which the switch is closed, and

- detecting and measuring time durations in which the switch is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in

the circuit further comprises a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil.

[Claim 7 as amended by auxiliary request 7 of the application to amend the patent in suit]

II. The defendants are ordered to refrain from offering, placing on the market or using , or importing or marketing them for the aforementioned purposes.boost power factor correction circuits (boost PFCs) in Germany or France

own,

if the circuit a has regulating unit, freewheeling diode, a in series with the freewheeling diodecharging coil connected , a switch, a charging capacitor and an electronic control and/or wherein the charging capacitor charging capacitoris charged by the controlled switch with a discharge current generated by the charging coil, in which case the switch can be switched on and off by the electronic control and/or regulating unit, .and if the electronic control and/or regulating unit is connected to an the input port of

- via a measuring resistor (R1) connected in series with the switch (M1), detects and measures the current through the switch during periods in which the switch is closed, and

- detecting and measuring time durations in which the switch is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil, anda further operating parameter of the boost PFC circuit in

the circuit further comprises zero crossing of the current flowing through the charging coil.a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the

[Claim 7 as amended by auxiliary request 7 of the application to amend the patent in suit]

The defendants claim,

I. dismiss ;the action

In the further alternative, in the event that the Chamber orders submission of documents and/or the of accounts in response to the application under IV.thesupportingin response to the application under III. submission

- on the side of the plaintiff only their legal representatives,

in the further alternative: only their legal representatives and no more than three reliable natural persons , andto be named by the applicant in advance

- are to an appropriate duty of confidentiality;

in the further alternative: to make the enforcement of the judgement dependent on the provision of 500,000, with partial security being proposed in at least the following amount:security or equivalent guarantees in the amount of at least EUR

Injunction (claim II), destruction (claim V), recall (claim VI) together at least EUR 450,000;

Information (claim under III.), rendering of accounts (claim under IV.) together at least EUR 50,000;

Provisional damages (claim under IX.) 10 per cent above the amount paid in full;to be

II. order the applicant to pay costs of thethe proceedings and the 's defendantother costs.

The defendants counterclaim,

I. declare invalid UPC Agreement in which the patent in suit is validated;the patent in suit to extent of theclaims 7 to 10 for all Contracting States of the

II. order the applicant and the defendant to pay costsothe.

The applicant claims that the Court should,

I. dismiss ;the actions for annulment

II. order the defendants to pay the costs of the actions for annulment and the costs incurred by the applicant in connection therewith;

and in the alternative,

the maintenance of claims 7-10 of the patent in suit to the extent of one of the following sets of claims, in the order of priority chosen here:

I. Auxiliary request 1:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit has electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects and measures in which the switch (M1) is closed, andthe current through the switch (M1) during periods

- detects and measures a further operating parameter of the boost PFC circuit in time durations in which the switch (M1) is open, the detected and measured further .operating parameter being the zero crossing of the current flowing through the charging coil (L1)

current, and

that the circuit further comprises current flowing charging coil (L1).a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the through the

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

II. Auxiliary request 2:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit has electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects the current through the switch (M1) during periods in which the switch (M1) is closed, and

- detects a further operating parameter of the boost PFC circuit in time durations in which the switch (M1) is open, the detected further operating parameter being zero crossing of the current flowing through the charging coil (L1), andthe

that the circuit further a decoupling element for capacitively decoupling the detection of the comprises current flowing .switch current and the detection of the zero crossing of the through the charging coil (L1)

8. Circuit according to claim 7,

where the zero crossing of the current flowing through the charging coil (L1) is potential-free.

separated, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

III. Auxiliary request 3:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit comprises electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly via a with the switch (M1measuring resistance (R1)), detects the current through the switch (M1) during periods in which the switch (M1) is closed, andconnected in series

- detecting of the boost PFC circuit in time periods a further operating parameter in which the switch (M1) is open, wherein the detected further operating parameter is the zero crossing of the current flowing through the charging coil (L1), and

that the circuit further comprises switch current and the detection of the zero crossing of the current flowing through the charging coil (L1).a decoupling element for decoupling the detection of the

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

IV. Auxiliary request 4:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit comprises electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly detects and measures the current through the switch (M1) during periods in which the switch (M1) is closed, and

- detecting and measuring a further operating parameter of the boost PFC circuit in time periods in which the switch (M1) is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil (L1), and

that the circuit further comprises a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil (L1).

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

V. Auxiliary request 5:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit has electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly via a measuring resistor (R1) connected in series with the switch (M1), detects and measures in which the switch (M1) is closed, andthe current through the switch (M1) during periods

- detecting and measuring time durations in which the switch (M1) is open, wherein the detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil (L1), anda further operating parameter of the boost PFC circuit in

that the circuit further comprises current flowing charging coil (L1).a decoupling element for decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the through the

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

VI. Auxiliary request 6:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit has electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly via a measuring resistor connected in series with the switch (M1)(R1) the current , detects during periods through the switch (M1) in which the switch (M1) is closed, and

- detects a further operating parameter of the boost PFC circuit in time durations in which the switch (M1) is open, the detected further operating parameter being zero crossing of the current flowing through the charging coil (L1), andthe

that the circuit further a decoupling element for capacitively decoupling the detection of the comprises current flowing .switch current and the detection of the zero crossing of the through the charging coil (L1)

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again at the charging coil (L1).the time of zero passage of the current through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

VII. Auxiliary request 7:

7. Boost converter power factor correction circuit (boost PFC),

wherein the circuit comprises electronic control and/or regulating unit, wherein the charging capacitor (C1) is charged by a discharge current generated by the charging coil (L1) through the controlled switch (M1),a freewheeling diode (D1), a charging coil (L1), connected in series with the freewheeling diode (D1)a switch (M1), a charging capacitor (C1) and an

whereby the switch (M1) can be switched off ,on and by the electronic control and/or regulation unit

characterised in that

that the electronic control and/or regulation unit is connected to a receipt

- directly or indirectly via a with the switch (M1measuring resistance (R1)), detects and measures the current through the switch (M1) during periods in which the switch (M1) is closed, andconnected in series

- detects and measures a further operating parameter of the boost PFC circuit in time durations in which the switch (M1) is , wherein openthe detected and measured further operating parameter is the zero crossing of the current flowing through the charging coil (L1), and

that the circuit further comprises a decoupling element for capacitively decoupling the detection and measurement of the switch current and the detection and measurement of the zero crossing of the current flowing through the charging coil (L1).

8. Circuit according to claim 7,

whereby the zero crossing of the current flowing through the charging coil (L1) is detected in a potential-separated manner, in particular inductively.

9. Circuit according to claim 7 or 8,

whereby the control and regulation unit switches the switch (M1) on again the charging coil (L1).when the current passes through

10. Circuit according to any one of claims 7-9,

whereby the current through the switch (M1) or a representative variable with a threshold value is compared and the switch (M1) is switched off again as soon as the threshold value is reached or exceeded.

The defendants oppose the alternative claims.

By Order dated 14 January 2025, the Judge-Rapporteur concluded the interim proceedings with effect from 16 January 2025 and issued instructions and conditions for the conduct of the oral hearing.

Factual and legal issues:

Interpretation

The applicant is of the opinion that by the term "detection" within the meaning of feature 7.3, the skilled person understands more than a mere request of the signals at the receipt of the electronic control unit. The signals must also actually be used.

The applicant is further of the opinion that claim 7 permits operation of the circuit according to the invention both in boundary-conduction mode (BCM) and in discontinuous-conduction mode (CDM).

mode (DCM), as the zero crossing of the coil current occurs in both operating modes and can be detected.

The fact that the current and voltage curves in Fig. 4 of the patent in suit indicate operation in the boundary-conduction mode for a preferred embodiment described in more detail in that context lead , even on the basis of general patent lawdoes not to an interpretation of claim 7 . Paragraph which is limited to thisprinciples of interpretation of [0023] as well as sub-claim 9 of the patent in suit show that this operation is merely optional.

The wording of claim 7 of the patent in suit does not mention what the signal indicating the zero crossing of the current and detected by the electronic control and/or regulating unit looks like, nor how it is generated or analysed. The tapping by a detection coil L2 and a resistor R2 is merely an example of an embodiment. In this example, a voltage signal generated by this is present at the receipt of the control unit the switch is open. If exceeds when this voltage signal a predetermined reference value, the control unit detects this undershoot as the zero crossing. In Figures 3 and 4, the zero crossing detected shortly after it occurs. The claim is not limited to inductive detection by means of a second coil. Furthermoreis also , the patent in suit is not limited to direct or indirect detection.

The claim also makes no provisions for the case of multiple zero current .crossings

Feature group 7.3 describes two different operating parameters that are determined from different signals that at the same receipt of the electronic control and/or are present . regulation unitThese different signals are supplied via (at least partially) different signal paths. if However, signals were transmitted to the same receipt of the electronic control and/or regulation unit , this could via both signal paths at the same timeimpair . The the intended detection of the operating parameters mentioned in each caseisolated detection of the switch current would be impaired, for example, if a signal were also transmitted simultaneously via the second signal path provided for the current zero crossing detection, as the measurement signal at the receipt of the control unit would then no longer represent the current flowing through the switch in an isolated manner. The patented function and significance of the decoupling element is therefore to prevent signals from via the when the switch is closed prevent being transmitted signal path providedfor current zero-crossing detection and to them from interfering with the (isolated) detection of the current flowing through the switch during this period.

Furthermore, the patent in suit lists a non-exhaustive list of possible embodiments of the decoupling element, including transistors and capacitive decoupling in addition to a diode. For a person skilled in the art, the term "capacitive decoupling" readily includes, in particular, the use of a capacitor as a decoupling element. Any design that prevents signals from also at the electronic control and/or regulation unit when the switch is closed from the signal path provided for current zero crossing detection being present is thus in accordance with the feature.

The decoupling element therefore only develops its patented effect during the period in which the switch is closed and the current is detected by the switch in accordance with feature 7.3.1.at the receipt of the electronic control and/or regulation unit

The defendants argue that the closing and opening of the switch M1 in the patent in suit is control unitcontrolled by the , which receives operating parameters for this purpose. The zero crossing of the current flowing through the charging coil L1 must be recorded as an operating parameter during the time in which the switch is open and can thus be used for closing the switch ([0023] (correspondingly also [0048] aE). The time from which no more current should . flow to the charging capacitor C1 via the charging coil L1 is to be detectedThe other operating parameter is the current . flowing through the switchSince very many operating parameters of a boost PFC circuit to the zero crossing of the current flowing through the charging coilare related , the patent in suit is characterised by the fact that its control and/or regulating unit specifically detects the zero crossing and does so for each zero crossing that occurs. The omission of "direct or indirect" detection emphasises that the patent in suit is concerned with detecting the specific zero crossing.

The acquisition of two measurement signals (i.e. on the one hand from the measurement of the switch current and on the other hand from the measurement of the zero crossing of the current via the charging coil) at only one pin of the control and/or regulation unit is realised by using a coupling element or decoupling element.

Even if the zero crossing of the current flowing through the charging coil L1 and the current through the switch M1 do not occur , simultaneouslythe measuring paths would always reach one pin of the control unit . The when the switch is closed if the decoupling element did not existdecoupling element prevents this and leads to decoupling of the detection. If is the switch closed - in the case of using a diode - the voltage changes and the diode blocks and no longer allows a signal from the L2/R2 measuring unit to pass through. This requires an actual separation of the signal path. The plaintiff is guilty of circular reasoning if it is of the opinion that it is sufficient that no signal is generated at the electronic control unit when the switch is closed.

Action for infringement

The applicant submits that the contested embodiment claim 7 of the patent in suit.infringes

It is of the opinion that the contested embodiment detects switch Q1 is open. When the switch Q1 is switched off, the charging coil current begins to drop. As long as it is still positive, it flows through the diode D1. the current zero crossing when If the current becomes negative, it flows through the diode for a very brief moment as the plasma stored in it is cleared. Only then does the charging coil current no longer flow through the diode, but through switch Q1, whose output capacitance it now discharges (for which switch Q1 does not switched on have to be and therefore no current flows). through its channelThis causes the voltage Vds at switch Q1 to drop and this voltage change is detected by pin 1 of the ASIC (U1). The defendants did not deny capacitor. the minimal inaccuracy from the elimination of the causality of the current zero crossing for the output of the negative voltage signal by the However, resultingthe plasma in diode D6 did not change the suitability of the signal for detecting the current zero crossing.

It irrelevant isfor the realisation of the detection of the zero crossing whether the attacked embodiment is operated in valley switching mode. The only decisive factor is that the electronic control and/or regulating unit detects . the zero crossing of the current flowing through the charging coil when the is openswitch The subsequent switching-on process is not the subject-matter of claim 7 of the patent in suit. This claim covers both operating modes in which the switch is switched on again when the zero crossing of the current is reached and those in which a certain time elapses between reaching the zero crossing of the current and the switch being switched on again.

The presence of two zero crossings and the fact that the capacitor emits another positive voltage signal switch Q1 opens are irrelevant.after also

Finally, when switch Q1 is closed, capacitor C3 prevents voltage signals from the signal path provided for current zero crossing detection from at being presentpin 1 of ASIC U1, which could distort . The capacitor C3 causes a capacitive decoupling in the sense of paragraph [0049] of the patent in dispute. If the voltage at switch Q1 does not change or changes only very little, no flows through itthe signal present during the switch currentthis period for detecting or only a very small current , since the current flow through a capacitor is to the change in the voltage applied to it. This is the case in the attacked embodiment when the switch Q1 is closed (and the current through the switch is measured). During this period, the voltage drop across the switch Q1 and its change are very small. As a result, the current through capacitor C3 is negligibly small and does not affect the to proportional switch current measurement signal applied pin 1 of ASIC U1. Capacitor C3 prevents the voltage (via the to the drain of switch Q1 during this period current zero-crossing measurement path) from influencing voltage drop to be measured at resistors R10A-R10D . Therefore, the capacitor also causes a potential separation. This does not change even if the capacitor C3 the defendants as an element of a high-pass filter formed with the resistors R5, R8 and R10the (for the purpose of switch current measurement)is understood by. Such a high-pass filter allows signals of high frequency (or with fast changes) to pass, signals of low frequency (or with slow changes) are blocked. Fast voltage changes, such as the drop in the drain-source voltage Vds at switch Q1 that occurs when the current crosses zero, would therefore be routed to pin 1 of ASIC U1would , while slow voltage changes, such as those that may , occur when switch Q1 is switched onnot. As a component of a high-pass filter, the capacitor C3 therefore a potential separation and thus enables undisturbed measurement of the when the switch is closed.also causes switch current

According to the claim, a signal overlay when the is open switch is not relevant.

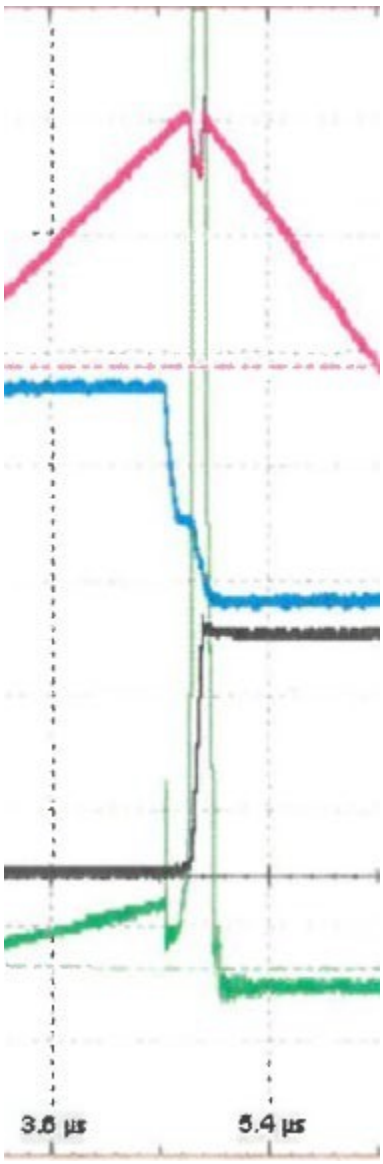
When the switch is closed, there is no signal that the switching current measurement.influences

The defendants are of the opinion that neither attacked embodiment detects the zero crossing of the current flowing through the charging coil (feature 7.3.2) during periods in which the switch is open, nor that the attacked embodiment has a decoupling element (feature 7.4.) in accordance with the patent in dispute.the electronic control and regulation unit of the

The defendants argue that in a comparison of the contested embodiment with Figure 3

of the patent in dispute. The contested embodiment does not have a detection coil as part of the measuring unit for the current flowing . The capacitor C3 measures the current flowing through the charging coil L4 through the charging coil L4neither nor does detect it the zero crossing of this current. Rather, the capacitor C3 is part of the
"Measuring unit" (capacitor C3 and R5, R8 and R10, which represent a high-pass filter) for voltage theacross switch Q1. For this purpose, it is permanently connected to pin of the control unit. If a voltage change occurs at switch Q1, current flows from switch Q1 and also to a capacitor C3 to the control unit and is as a measurement signal at the pin of the control unit. If there is no voltage change, no current flows from capacitor C3, which is then also present measurement signal at the pin of the control unit.as a

As a result, the challenged embodiment does not any of detect two zero crossings between which the current of the charging coil is negative, which results from the parasitic capacitance of the switch Q1. Thus, Figure 17 (Figure 2 of Appendix K11) shows nothing happens , at the pin (green curve, U1_1) at the time of the zero crossing of the current flowing through the charging coil L4but that the voltage only drops . at a later point in timeA noticeable reaches measurement signal from the capacitor C3 with the resistors R5, R8 and R10 the pin when the capacitor C3 detects a drop in the voltage Vds via the switch Q1 (black curve, Vds). The voltage Vds corresponds to the output voltage VBus as long as current flows to the charging capacitor EC1 freewheeling terminal D6. Once the current flow has ended, the voltage changes, which in turn means that the switch Q1 no longer connected in parallel with the charging capacitor EC1from the charging coil L4 via the is . As a result, the voltage Vds across the switch Q1 changes and assumes . the value of the input voltage VInSince the input voltage VIn is lower than the output voltage VBus, the voltage Vds decreases, which is reflected in VIn). the black curve in Figure 17 by the drop from a high level (VBus) to a lower level (not zero, but And as the 's plaintiffown measurements have shown here, the voltage drop at switch Q1 does not with the zero crossing of the current flowing through charging coil L4begin , but later. The measurement signal sent voltage change at switch Q1 can be clearly recognised in the green curve in Figure 17 by by the capacitor C3 to the the "sagging" of the green curve U 1_1 when the voltage Vds across the switch drops. This measurement of the voltage change across the switch Q1 is used , to control the switch M1as Figure 17 illustrates, because the voltage that switches (blue the switch M1 curve Vgs) does not increase with the first zero crossing of the current flowing (pink curve), but when the voltage Vds across the switch changes. The switch is then closed. During this time, the voltage across the switch Vds remains constantly low through the coil (at the level of the input voltage). Then the switch Q1 is opened again, which can be recognised by the fact that the voltage Vgs, which switches the switch Q1, drops (blue curve). The switch Q1 opens and it can be seen that the voltage Vds at the switch (black curve) then rises very quickly (back to VBus). And of course the capacitor detects C3, which permanently monitors , also the voltage across switch Q1 as a "measuring unit"this voltage change at switch Q1 and a measuring signal is sent , as to the pinthere no decoupling element. This can also be seen from the following illustration, which is taken from the statement of defence.



When switch Q1 is opened (see blue curve), dropthe voltage across switch Vds (see black curve) rises . very quicklyThis leads to a very clear deflection of the green curve, i.e. to a very clear measurement signal for the switch voltage Vds at the addressed by the plaintiffpin . The measurement signal for the current at switch Q1 is also fed to the pin, as shown by . the two lower curves R10 and U1_1 in Figure 17The dark blue curve the current across the switch, which is continuously reflected in the green curve, i.e. at the pin in the form of more or less clear measurement signals. This signal is then clearly superimposed by signals from the capacitor C3 when the voltage at switch Q1 changes (see the two deflections in the green curve). Both measurement signals (the current through the switch Q1 and also the voltage across the switch Vds) are permanently present at the pin considered by the plaintiff not decoupled anything. Every change in voltage across the switch that caused current to flow through the capacitor was in the form of a and are by transmitted , to the pin signalas was every current detected . This by the resistors R10-Dmeans that the voltage across the switch is always measured and any change that is detected is forwarded to the control unit. In this respect, there is no detection only during periods in which the switch is open (feature 7.3.2). The application description of the in ASIC installed challenged embodiment the does not indicate otherwise either

(Annex K 12). Apart the fact that this could , not be taken into account in purely formal terms due to the lack of translation and the lack of a corresponding waiver requestit is also not clear from this that the zero crossing of the current flowing through the coil is recorded, but rather the operating parameter above the switch. Even if this operating parameter is related to the zero crossing (like almost all operating parameters), it cannot be equated with it. All operating parameters, as well as the voltage across the switch, follow or precede of the current flowing through the coil, whereby the time offset on the components, the zero crossing depends but also on the voltage or the temperature - not only the ambient temperature, but also the operating temperature, which increases during operation.

Nor can the plaintiff rely on the fact that the "measuring unit" for the other operating parameter (the voltage across the switch) is C3, which current a capacitor only allows to flow when it detects a change in voltage. This is because it does not decouple this "measuring unit" from the control unit or the "measuring unit" for the current through the switch, but only measurement signals to be causes sent when there are voltage changes that occur both when the switch is closed and when it is open.

Zero crossings would also occur in CCM mode. The defendants further argue that the at the currents occurring and voltages are of great importance. When properly considered, in the challenged embodimentrespective components of the boost PFC circuit a switching process, so-called valley switching, occurs . This switching process is dependent both the input voltage after the first zero crossing of the choke current onand the operating temperature of the components. The additional parameter detected is not the zero crossing of the current flowing through the charging coil, but by the control unit at pin 1 a voltage signal resulting and 3. It is to determine the time of the zero crossing in the attacked embodiment from the switching current between phases 2 not possible boost diode.due to the above-mentioned dependencies and the plasma behaviour of the

The defendants are further of the opinion that galvanic isolation in the signal path (feature 7.4), which is to be effected by the capacitor, refuted isby the plaintiff's own measurement results. The patent in dispute is about actually separating . the signal path between the detection of an operating parameter and the detection of the control unitThis does not . happen with capacitor C3Even , when the switch a very is closedthe pin of the control unit receives clear signal from current flowing which by the peaks through capacitor C3can be recognised in the green curve. According to the patent in dispute, however, the other operating parameter (zero crossing) only be detected during periods in which the switch is open.should

Both the capacitor C3 with resistors R5, R8 and R10 and the resistors R10A-D are permanently connected to the same pin of the control unit without interruption. The only thing that the challenged embodiment takes advantage of is that the that results when the switch is open measurement signal from capacitor C3 occurs when the is open switch and therefore not at the same time as the actual measurement signal for the current . And flowing via the switchthe measurement signal from capacitor C3, when the switch is closed and its voltage therefore rises very quickly, is such a clear peak that the control unit can deal with this and the simultaneous information on the current via the switch. this However, does not change the fact that both "measuring units" - capacitor C3 with resistors R5, R8 and 10 and resistors R10A-D - are connected uninterruptedly (without a decoupling element) to the control unit at one pin.always

According to the defendant, the contested embodiment therefore does not have a decoupling element according to the invention. The capacitor C3 reacts to any voltage change across the switch/MOSFET and then via the signal path with the resistors RM1 and RM2 if a voltage level other than zero is present at pin 1 of the control unit. If there is no change in the voltage across the switch/MOSFET, the capacitor C3 also "detects" this. In this case, the capacitor C3 does not react and a voltage level of zero is present at pin 1 of the control unit via the signal path C3, RM1 and RM2. However, the signal path from capacitor C3 to pin 1 is not blocked or disabled in any way. It is not decoupled and any kind of voltage change across the switch/MOSFET would lead to a change in the voltage level at pin 1, regardless of whether the switch is open or closed.

Legal consequences of the infringement action:

The defendants are further of the opinion that the plaintiff requires an interest in a declaratory judgement for the findings pursuant to Article 64(2)(a) UPCA, which does not exist. Furthermore, the request for information is not justified and there is also no entitlement to the submission of documents; alternativelycould , these only be made under the protection of a secrecy protection order. A claim to the disclosure of accounts is barred because the Rules of Procedure a different procedure for the disclosure of provide for accounts. Furthermore, both are a destruction claim and a recall claim too . As the potential damage in the event of a conviction is considerable, an order for enforcement security is necessary, with the amount in dispute forming the lower limit for this.

Counterclaim

The defendants are of the opinion that the patent in suit within the scope of claims 7 to 10 in view of the citations US 5, 576, 941 (Annex D3, Nguyen), is not D8, Adragena). new EP 1 083 648 A2 (Annex D4, Lürkens), WO 2004/107 547 A1 (Annex D6, Melai) and US 2005/0207193 A1 (Annex Furthermore, in view of the citations US 5, 737,209 (Annex D5, Stevens), NCP 1601A (Annex D7, Onsemi) and WO 2003/017453 A1 (Annex D9, Green Power), DE 4 321 585 A1 (Annex D10, Samsung) and US 5,892,355 (Annex D12, Pan- sier)is also not based on inventive step. At the oral hearing, the defendants cited D7 (Onsemi) for the first time to attack the novelty and attacked the inventive step by a combination of D3 (Nguyen) and D4 (Lürkens)., the patent in suit

The applicant is of the opinion that claims 7 to 10 will It criticises the lateness of the new attacks on novelty and inventive step based on D7 (Onsemi) and D3 (Nguyen) with D4 (Lürkens). In the alternative, it defends the claims in the form of the seven auxiliary requests listed.prove to be legally valid.

Reasons

The admissible action for infringement is not successful on . the meritsThe admissible counterclaim is also unfounded.

A. Admissibility of the action and counterclaim

The Düsseldorf Local Court has jurisdiction for the infringement action pursuant to Art. 33 (1) b) UPCA. Apart from this, the jurisdiction of the local division chosen by the plaintiff is deemed to be recognised in the absence of an objection by the defendant, see R. 19 (7) RoP.

There are also no concerns regarding the admissibility of the counterclaim. Pursuant to Art. 32 (1) (e) UPCA, the UPC Agreement has exclusive jurisdiction for counterclaims for revocation of (European) patents. As there is currently no opt-out (Art. 83 (3) UPCA) from the exclusive jurisdiction of the court in relation to the patent in dispute, the UPC - as the common court of the UPC Agreement Member States - has international jurisdiction for the present counterclaim pursuant to Art. 24 (4), 71a (2) (a), 71b (1) of Regulation (EU) No. 1215/2012.

B. Scope of protection of the patent in suit

The patent in suit requires interpretation both with regard to the question of infringement and for the assessment of its legal validity.

I.

According to Art. 69 EPC in conjunction with the Protocol on its interpretation, the patent claim is not only the starting point, but the decisive basis for determining the scope of protection of a European patent. The interpretation of a patent claim does not solely on its exact wording in the linguistic sense. Rather, the description and the drawings must always be taken into account as explanatory aids for the interpretation of the patent claim and not only be used . to resolve any ambiguities in the patent claimHowever, does not this mean that the patent claim merely serves as a guideline and that its subject matter also extends to that which, after examination of the description and drawings, appears to be the patent proprietor's request for protection (UPC_CoA_335/2023, Order of 26 February 2024 in conjunction with Order of 11 March 2024). Order of 11 March 2024, GRUR-RS 2024, 2829, second headnote and para. 73 - 77 - 10x Genomics v. Nano-String; UPC_COA_182/2024, Order of 25 September 2024, para. 82 - Mammut v. Ortovox; see also UPC_CFI_7/2024 (LD Düsseldorf), decision of 3 July 2024, ORD_598324/2023 - Franz Kal- dewei v. Bette).

II.

The patent in dispute is interpreted from the perspective of the relevant skilled person. In this case, she holds a university degree in electrical engineering and has several years of professional experience in the development of electronic circuits.

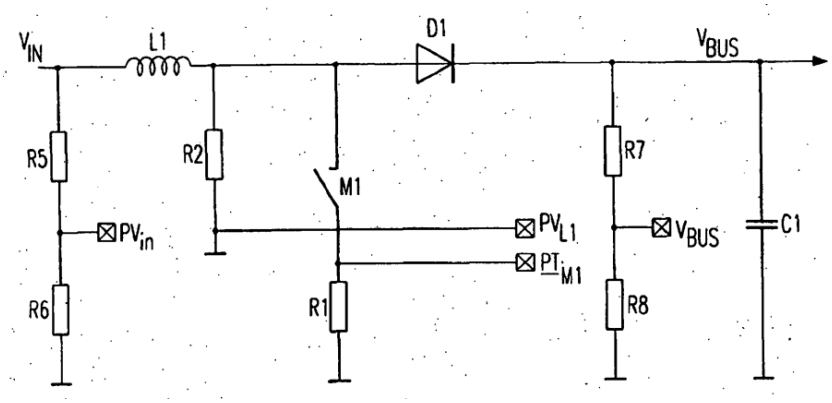
III.

The invention relates to a boost converter power factor correction circuit (so-called boost PFC circuit).

This type of circuit is used to convert level. At the same time, the circuit can be designed to a load with a power factor a supplied DC or AC voltage to a higher represent of almost 1 (see paragraph [0002] of the patent in suit; in the following

paragraphs of the patent in suit without citing the source). The circuits are often in operating devices for light sources. If the light sources are to be , the DC output voltage of the boost PFC is converted into a high-frequency AC voltage via inverters (paragraph [0003]). Since a boost PFC usually not short-circuit proofoperated at high frequency, the operation of such a circuit is by control and regulation circuits to which parameters from the supply voltage, from the boost PFC circuit and/or the load circuit fed back. In the , regulation unit prior artthis feedback of the measurement parameters to the control and means that numerous pins are used an ASIC used as a control and regulation unit (see paragraph [0004]).in

Figure 1 of the patent in suit, shown in slightly reduced form below, shows a circuit known art.from the prior



The AC or DC voltage $_{Vin}$ is supplied. The charging coil L1 in with a freewheeling diode D1is connected . series A connection point between the freewheeling diode D1 and the charging coil L1 be selectively connected to earth . A charging capacitor C1 can be charged via the freewheeling diode D1. , is on its high-potential side when accordingly can via the switch M1The output voltage the switch M1 is clocked $_{VBus}$, which regularly higher than the amplitude is (see [0006]). of the supplied voltage $_{Vin}$The supply voltage $_{Vin}$ and the current of the charging coil L1 are at detected . the pins $_{PVin}$ and $_{PVL1}$detecting the current, the zero crossing of the current can inferred flowing through the charging coil (see section [0008]). Furthermore, the current flowing through the switch M1 in the closed state can be detected (see section [0009]). by means of a measuring resistor (shunt) R1 at a pin $_{PIM1}$ Finally, the output voltage $_{Vbus}$ at a pin $_{PVbus}$ can also be detected (paragraph [0010]).via a voltage divider R7, R8

The patent in suit recognises US 5 428 286 (= D1, Kha), which discloses a boost PFC circuit in which both the current flowing through the switch and the charging current are at different times, detected input between a diode and a capacitor. The boost PFC switch disclosed here operates in continuous conduction mode (CCM) (see section [0011]).when the switch is open and when it is closed, at a measuring point or

The patent in suit mentions as further prior WO 01/82458 A1 (=D2; Philipps 01) art, which discloses an integrated circuit of an AC-DC converter, at the numerous receipts of which various parameters are tapped and processed. Among other thingsis at a first , a current through a charging coil of the converter detected . receipt via an ohmic resistor RZCZero crossings are determined . by the integrated circuitIn addition, an offset signal is generated by a circuit and added , which corresponds to a current through a switch of the converter. This sum signal isto a signal at a seventh connection

recorded and analysed at the seventh connection (see para. [0012]).

The patent in suit does not explicitly criticise the prior art, but formulates against its background the task of the number reducing for the measurement signals, of detection points e.g. the number of pins required for an ASIC as a control and regulation circuit.

The patent in suit solves this problem with a boost converter power factor correction circuit which has the features of claim 7. Claim 7 can be structured as follows:

7.1 Boost converter power factor correction circuit (boost PFC circuit*),* the circuit having:

7.1.1 a freewheeling diode (D1),

7.1.2 a charging coil (L1) connected in series with the freewheeling diode (D1), which generates a discharge current,

7.1.3 a switch (M1),

7.1.4 a charging capacitor (C1), which is charged with the discharge current by the controlled switch (M1),

7.1.5 an electronic control and/or regulation unit.

7.2 The switch (M1) can be switched on and off by the electronic control and/or regulation unit.

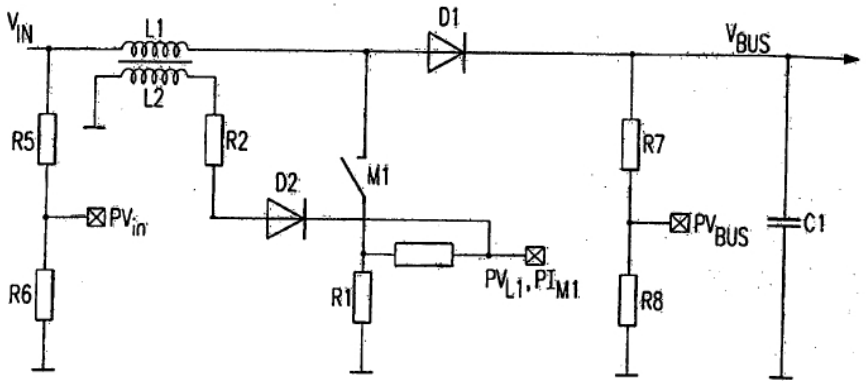
7.3 The electronic control and/or regulation unit detects at one receipt*,*

7.3.1 directly or indirectly the current through the switch (M1) during periods in which the switch (M1) is closed;

7.3.2 the zero crossing of the current flowing through the charging coil (L1) as a further operating parameter of the boost PFC circuit at times when the switch (M1) is open.

7.4 The circuit has a decoupling element for decoupling the detection of the switch current and detection of the zero crossing of the current flowing through the charging coil (L1)*.*

The core of the invention is to combine the signals of two operating parameters and thus a pin save . on the control and/or regulation unitCombining the function of switch current detection with the function of current zero crossing detection is possible because triggering of these functions (in a boost PFC circuit) is only required sequentially and never simultaneously (see para. [0015]). This combined detection at the same measuring point at different times is realised decoupling element. An embodiment example of a sophisticated boost PFC circuit is shown in the following, slightly reduced Figure 3 of the patent in suit (para. [0017]).by using a coupling element or



The circuit includes a freewheeling diode (D1), a charging coil (L1) connected in series with the freewheeling diode (D1), a switch (M1), a charging capacitor (C1) and an electronic control and/or regulation unit, of which only the one receipt $_{PVL1}$, $_{PVM1}$ is shown. The charging capacitor (C1) is charged controlled switch (M1) . The switch (M1by the electronic control and/or regulation unit. by the with a discharge current generated by the charging coil (L1)) can be switched off on and The electronic control and/or regulation unit directly or indirectly the current through the switch (M1) a receipt during periods in which the switch (M1) is closed. detects at The electronic control and/or regulation unit detects a further operating parameter of the boost PFC circuit in time periods in which the switch (M1) is open. The detected further operating parameter is the zero crossing of the current flowing through the charging coil (L1). The current is by the charging coil L1 via a detection coil L2 and a picked up . inductively resistor R2The inductive detection is separated from the one detection pin $_{PVL1}$, $_{PVM1}$ by a decoupling element, such as the diode D2 shown here (cf. Para. [0025], [0034).

IV.

Feature group 7.3 and feature 7.4 require more detailed explanations in view of the parties' dispute.

1.

Feature 7.3 - "one receipt"

According to the wording of the claim, the electronic control and/or regulation unit detects the switch current and the discharge current of the charging coil L1 "one" receipt.at

In principle, the wording of the claim in all three language versions allows both the numerical word "one" and the indefinite article to be understood ("at an input of the electronic control and/or regulation unit" or "l'unité de commande et/ou de régu- lation électronique permet, au niveau d'une entrée"). However, by considering the claim as a whole and also taking into account the description and the examples of embodiments, the skilled person will the indication "at one input" as specifying the number of inputs, namely for understand . a single inputThe decoupling element within the meaning of feature 7.4 for decoupling the detection of both operating parameters would be obsolete if the detection receiptswere to . take place at two different Furthermore, the patent in suit in paragraph [0033] of the description that both the current IM I through the closed switch M1 and the zero crossing of the current through the charging coil L1 are detected .at a single point of the circuit PVLI, PIMI

This single point can be easily recognised . in Figure 3Finally, the use of one receipt for two measurement signals represents the central core of the invention (para. [0017]).

2.

Characteristic group 7.3 (record)

a)

In , feature 7.3the person skilled in the art understands detection to mean more than simply tapping the signals present. Detection means that the signals that reach the control unit at one receipt are measured and can be used for further processing (e.g. for controlling the switching process).

In the context of electrical engineering and electronics, " can for the the pure literal sense of the term "*acquisition*purely passive signal acquisition specialist, i.e. the recording or the output of a signal that is present . at the receipt of a circuitHowever, depending on the technical specification, have different meanings and functions depending on the specific application context.the term can

Another possible technical meaning of "*capture*" is measurement and processing. A signal is actively measured, for example by voltage dividers, current transformers or sensors, and then further processed in the circuit. Typical applications include measuring the switch current via a measuring resistor or detecting a zero crossing of a current (e.g. due to inductance or voltage changes). Another possible technical meaning of "*detection*" is the comparison with reference values, i.e. the signal is not only recorded but also compared with defined reference values in order to states such as "too high" recognise . or "too low"A typical application is the detection of limit values in a control system.

The second meaning can already be found in the wording of the claim. The control and/or regulation unit of the boost PFC circuit directly or indirectly detects the switch current and the zero crossing of the current flowing through the charging coil.

According to the information in paragraph [0002], the boost PFC circuit within the meaning of the patent in suit is used to DC convert . The power factor describes the ratio of actual power (active power) to the total absorbed power (apparent power). By smoothing the current consumption, the current flow is or AC voltage to a higher level at a power factor of approximately 1adjusted so that it the course of the mains voltage sinusoidally. This improves the power factor and reduces the reactive power. In other words, a boost PFC circuit is used to improve the power factor of an electrical load and at the same time to smooth the current consumption by actively regulating the current flow. This active regulation is performed by the control and/or regulation unit, which can be used to switch the switch M1 on and off (feature 7.2).

Features 7.3.1 and 7.3.2 specify the operating parameters that the control unit can use as the basis for switching the switch M1 on and off.

In accordance with feature 7.3.1, the current through the switch is recorded. The switch current is the current that flows through the main switch, e.g. a MOSFET, of the boost PFC circuit. Precise measurement is necessary to determine the switch's switch-off point. Incorrect measurement of the switch current can lead to uncontrolled current peaks or

lead to overloads. The method proposed in the patent in suit for detecting the switch current, which is well known, is the measurement of the voltage via a measuring resistor connected in series with the switch (see Figure 1). It can be seen [0055].in particular in paragraphs [0009] and

> "[*0009] Furthermore, the through this switch in the closed state of the switch M1 can current flowing M1 be detected pin PI M 1.by means of a measuring resistor ("shunt") R1 at a*
>
> *[…]*
>
> *[0055] If, on the other hand, switch M1 is switched off, the freewheeling diode D1 is conductive. The charging coil then discharges via the freewheeling diode D1 into a charging capacitor C1, which the freewheeling diode D1 to earth and to an is exposed output voltage Vbus. A current measuring resistor (shunt) R1 in the source line of the switch M1 enables when closedthe current flowing , for example to be able to determine a possible overcurrent condition."through this switch M1 to be detected the switch M1 is*

Furthermore, paragraphs [0020] and [0021] describe how the zero crossing of the current flowing charging coil is detected:through the

> "*[0020] The zero crossing of the current flowing through the charging coil can be detected inductively, for example.*
>
> *[0021] The zero crossing of the current flowing through the charging coil can be determined detection coil inductively coupled to the charging coil by the fact that at the time of the zero crossing the voltage at the detection coil shows an edge. [...]"by means of a*

The control and/or regulation unit can switch on again at (section [0023]).the switch (M1) the time of the zero crossing

The defendants rightly point out that claim 7 does not specify the concrete control measures which the regulation and/or control unit as a result of takes the further processing. The switching-on process of the switch M1 by the regulation and/or control unit is only the subject of sub-claim 9. Sub-claim 10 specifies a possible further processing step in more detail (comparison with a threshold value) and mentions the switching-off process.

Nevertheless, when reading the feature group 7.2. and 7.3. the skilled person recognises that the control unit controls the switch because it can switched off on and "*by it*". In this context, the skilled person also sees that the operating parameters mentioned can in any case also be used to control the switch, especially since the described durations are characterised by the state of the switch (open/closed). Precise detection of the zero crossing and switch current parameters enables the current consumption to be optimally adapted to the voltage, which the power factor. improves Precise detection of the signals can reduce switching losses, current peaks and overloadscomponent . also In the example in paragraph [0045], it is mentioned that the switch M1 is switched off at regular intervals, i.e. it can be switched on and off by the regulation and/or control unit in the sense of feature 7.2.

In particular, the skilled person recognises that the detection and measurement of the switch current and zero-crossing current is carried by switching components arranged upstream of the receipt (pin) of the control unit (L2)and R2 for the zero crossing (para. .[0032])/M1 and R1 for the switch current

(para. [00035]).

b)

In claim 7, the patent in suit does not specify how the switch current must be . Its design is left to the person skilled in the art. This can be done directly or indirectly. detectedThe embodiments do not limit the broad wording of the claim. Insofar as paragraph [0035] states that the current IMI through the switch M1 can be measured at the point PVLI, PIMI via the measuring resistor R1, this is only one way of detecting the switch current.mentioned in the description and shown in the figures

c)

The claim also leaves the method of detecting the zero crossing to the person skilled in the art. The inductive detection of the coil current via a detection coil L2 and a resistor R2 is also only one example (para. 0032]). Paragraph [0030] recognises this type of detection as advantageous, but emphasises that it does not be combined with a circuit as shown in Figure 3.have to

Furthermore, the contested patent claim does not specify in more detail that the zero crossing is to be detected at a specific point in time.

However, the skilled person recognises from the explanations in paragraphs [0047] and [0048] and Figure 4 that the detection should take place immediately at the start of the zero crossing. If there is a slight time offset between the occurrence and detection of the zero crossing, this is not detrimental. The person skilled in the art is aware that Figure 4 does not represent a real-time measurement, but is intended to . illustrate according to signal curves at defined points of the circuit its general principleThe defendants also concede that the detection of the zero crossing occurs after the zero crossing, as there are delays in every circuit due to the structure and signal routing alone. Contrary to the defendants' view, the patent in suit does not exclude the detection of the zero crossing on the basis of events immediately following it. According to the invention, a signal is to arrive at the receipt of the control and regulation unit which the conclusion shortly allows that no more discharge current is flowing . through the charging coil L1The wording of the claim allows for . the fact that this signal is generated because other causalities are taken into account between the no longer occurring current flow, as long as they the information to be detected in the signal "is flowingdo not change no current more "From the point of view of the person skilled in the art, who functionally has an optimum control of the circuit by the control unit in mind, any is detection of the zero crossing at the one pin in accordance with the invention, which still such a way takes place in in terms of time that it does not lead (e.g. to any impairment of this control the signal arrives pin that a large loss of time occurs in the alternation between charging and discharging and thus the improvement of the power factor is reduced).so late at the

Insofar as the defendants have argued for the first time in the duplicate that zero crossings in CCM modewould , occur the argumentation is not . comprehensibleIn this mode, the switch switched on before a zero crossing can occur.is

3.

<u>Feature 7.4 (decoupling element)</u>

A decoupling element within the meaning of feature 7.4 is a separate component that capable of decoupling a signal

transmission via the signal path intended for current zero crossing detection when the switch is closed.

The plaintiff rightly emphasises that the situation in which decoupling is necessary is that in which the switch is closed. This is because only in this state does the current flow from the charging coil L1 through the switch M1 and the switch current can be detected receipt of the control unit (ASIC). However, because the claim is based on a circuit design at the one in which components continue to tap the coil current (in Figure 3 the detection coil L2 and the measuring resistor R2) and this signal is also conducted to one of the inputs of the control unit when the switch is closed, the signal must be isolated (in Figure 3 by blocking using diode D2) in order to be able to detect control unit (in Figure 3 PVL1, PIM1). The decoupling element ensures that the signals do not interfere with each other.only the switch current at the one receipt of the

The wording of the claim does not any specify particular requirements for the spatial and physical design of the decoupling element. The component is functionally characterised in that it must be suitable for decoupling the detection of the switch current and the detection of the zero crossing of the current flowing through the charging coil.

The person skilled in the art will, however, obtain more detailed information from the general description as to how the decoupling function is to be achieved by the element. Paragraph [0017] states that the combined detection of the two signals at a measuring point is realised by potential separation. The potential separation is explained as "using a coupling element or decoupling element". Potential separation describes the so-called galvanic separation, in which two conductive objects that normally exchange current with each other are separated. In other words, this meansthat electrical conduction between two circuits between which power or signals are exchanged is avoided. A transmission of electrical signals does not take place or is interrupted .by the separation

The embodiment example in Figure 3 describes diode D2 as the decoupling element. The argument here explains that by blocking the diode 2, for example, the coil current detection is decoupled from the switch M2 so that the current through the switch can be measured (para. [0049]). Blocking the diode decouples the coil current detection from the switch. in isolation The function of the decoupling element described here is nothing other than the interruption of the current flow from the detection coil L2 to the receipt PVLI, PIM1. The patent in suit also mentions a non-exhaustive list of possible embodiments of a decoupling element, namely in addition to a diode, also transistors or a capacitive decoupling [para. 0049]. Here too, the function of the possible components mentioned is equally cha- racterised: Comparable to the diode SD2, a or capacitive decoupling be provided, which thus the switch M1 from the potential when it is switched on. can also isolate of the detection coil L2 All embodiments therefore provide for the principle of galvanic isolation, whereby capacitive isolation is merely a sub-case of galvanic isolation.

Insofar as the plaintiff states that the components whichcapable of capacitive decoupling typically include capacitors as passive electrical components, this is to be agreed with. However, according to the patent in dispute, the capacitors must be designed in such a way that they interrupt detects coil current. Attenuation or reduction of the signal is not sufficient, but complete isolation is required. The purpose of decoupling is to ensure that only onethe electrical signal path from the receipt of the regulation and/or control unit to the component which the

signal can be received in isolation. High-pass filters, for example, in which parts of the signal can , be passed throughcannot guarantee from the other signal. Depending on the chosen design of the circuit, exceptional situations that should almost never occur could then occur more frequently. This possibility is a different situation from the one envisaged by the patent in suit.100% protection of the signal path against interference

There no indications of any other understanding of decoupling in the patent in suit. Both the general description and all examples of embodiments unanimously require potential isolation. Insofar as capacitive decoupling mentioned, the patent in suit expressly describes this only in the variant of potential isolation (cf. para. [0049]). Since the capacitor a possible component that can , thenbe used for capacitive decoupling, according to the allocation of the patent in suit, only in such a way that the potential of the components that tap the coil current (in Figure 3 the detection coil L2 and the measuring resistor R2) is completely separated from the switch by the use of the capacitor. This is also not a narrowing interpretation to an embodiment example, but the person skilled in the art sees the embodiment example in the context of paragraph [0017] of the general description.

It is not apparent that attenuating the for the sophisticated decoupling function. signal or similar would be This is also because the precise detection of the zero-crossing and switch current parameters is a functional prerequisite for an optimum adaptation of the current consumption to the voltage and thus for the improvement of the power factor. This is additionally supported by the fact that both parameters only sequentially and never occur simultaneously (see section [0015]). The decoupling is intended to avoid signal path. In contrast, it cannot be inferred from the patent in dispute at any point that it accepts less precise detection and thus losses or inaccuracies in the power factor correction in favour of saving a pin on the control and/or feedback unit.any interference with the respective

To the extent that the plaintiff's expert advocates a broader understanding, according to which it is sufficient that the decoupling element only has to ensure that the voltage applied to the coil L2 does not influence the voltage at the input of the control unit and that other variables than the coil current must be kept away from the receipt of the control unit (see Annex K16, p. 6 f.), he does not any citesubstantiated information from the patent in suit to support this view.

C. Legal status

The counterclaim is unfounded because the subject matter of the patent in suit is new and inventive and thus the patent in suit proves to be legally valid.

I. New attacks on the legal position in the oral proceedings.

Insofar as the defendants based a on the D7 (Onsemi) and an inventive step attack on a combination of the D3 (Nguyen) and the D4 (Lürkens) for , these attacks are not taken into account.novelty attack the first time at the oral hearing

Insofar as this may be , regarded as an amendment of the action pursuant to R. 263 RoPit is to be regarded as such pursuant to R. 265 (2)(a),
(b) RoP should be rejected. Firstlyhave , the defendants should raised these attacks at the latest with due diligence in the Reply to the counterclaim counterclaim(for).rejection even in the case of initial submission of the

Reply UPC_CFI_265/2023, CD Paris, judgment of 29 July 2024, para. 23 et seq.), but they also hinder unreasonably the plaintiff in its conduct of the proceedings. If the procedure is not regarded as an amendment to the action, but as an additional argument in favour of the destruction of the patent in dispute, it must nevertheless be rejected in accordance with R. 9.2 RoP. The essential arguments must be introduced into the proceedings as early as possible within the statutory time limits. Strategic tactics aimed at a surprise effect are just as Rules of Procedure alien to the as the introduction of completely new means of attack based on the statement of a merely preliminary assessment by the court at the beginning of the oral proceedings, especially since this is not done uniformly in the UPC Agreement.

II. Novelty

A technical teaching is new if it from in at least one of the known features. deviates the prior art Only that which is directly apparent to a person skilled in the relevant technical field from the publication or prior use . Knowledge that a person skilled in the art only gains on the basis of further considerations or the consultation of further writings or uses is not prior art (see UPC_ CFI_452/2023 (LK Düsseldorf), Order of 09/04/2024 is anticipated in the prior art- Ortovox v. Mammut; UPC_CFI_7/2024 (LK Düsseldorf), Decision of 03/07/2024 - Kaldewei v. Bette).

1. D3 (Nguyen)

The citation does not show a direct and unambiguous disclosure of features 7.3,
7.3.2 and 7.4.

D3 describes the averaging of currents in a boost converter circuit. Diodes are used for signal processing.

Insofar as it is disputed whether the CCM mode has zero crossings or not, the court with the argumentationagrees . plaintiff's It rightly points out that in this mode the charging coil never the reaches value 0 because the current flows continuously or because the switch is switched on (again) zero crossing. Smoothing is irrelevant in this context.before the

The circuit disclosed by D3 is not designed to provide precise, separate detection switch current and zero crossing at one and the same receipt.

Figure 9 shows two signals : at the receipt IFThe switch current through by the MOSFET 148, which has been converted into a voltage and transformed the measuring resistor 141and the diode current , which has been converted into a voltage and transformed by the measuring resistor 141. through the diode 138It is not clear to the person skilled in the art why a zero crossing of the coil current should be detected here. As explained, the CCM mode has no zero crossings. A zero-crossing detection is therefore neither nor shown description in column 9, lines 32-60. In particular, the person skilled in the art does not recognise that the signals are detected at a receipt of the control unit 150 for controlling the switch. Thus, the phase-controlled windings 136 and 146 each supply a signal that is fed to the DRIVE line 152. The opposite ends of the windings 136 and 146 are connected within Figure 9 in the associated

are coupled to each other to provide an output for the feedback current input IF via the coupling line 158. The signals are therefore transmitted to two receipts.

Finally, due to the lack of detection of a zero crossing, the diodes 154 and 156 cannot be assigned the function of a decoupling element.

2. D4 (Lürkens)

D4 describes the current measurement with a measuring resistor and the separation of signals by specific circuit components.

There no isdisclosure of the detection at a receipt of the control unit (Note 7.3). Paragraph [0019] and Figure 2 disclose that the switch current is detected and the connection CS of the control unit is used to switch off the switch S. Paragraphs [0030] and [0031] show the skilled person that the ZVS operation, the switching of the switch S at a switch voltage of almost zero volts, is used. However, the ZVZCS and CS receipts are two different inputs of the control unit 6.

By not disclosing a double assignment of a receipt, no decoupling element (feature 7.4) is directly and unambiguously disclosed.

3. D6 (Melai)

D6 describes DC-DC converter which, due to its high power factor, is suitable for use in an electronic ballast circuit for supplying a lamp. As shown in Figure 1 of D6 reproduced below, which was submitted by the defendants with coloured highlighting as Annex D6a

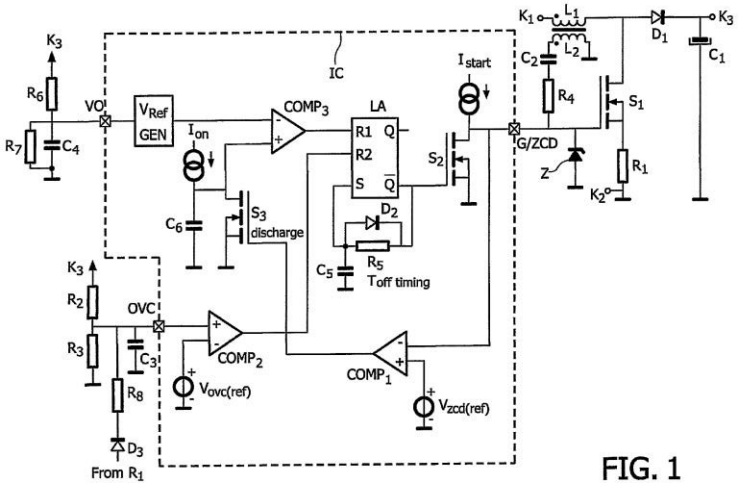


FIG. 1

the input terminals K1 and K2 for connection to a supply voltage source that a are suppliesDC voltage connected whose receipt is connected to the mains. The applied to the input terminals K1 and K2 to the respective output terminals of a rectifier DC voltage has the form of a rectified sine wave. The input terminals K1 and K2 are connected in series by the inductive element L1, the switching element S1

and the ohmic resistor R1. The series connection of switching element S1 and ohmic resistor R1 is bridged by a series connection of diode D1 and capacitor C1. An output connection K3 is connected the capacitor C1. A series circuit consisting of the secondary winding L2, the capacitor C2 and the ohmic resistor R4 is connected between the input connection K2 and a control electrode of the switching element S1. The secondary winding L2 is magnetically to the to a common connection of the diode D1 and coupled . inductive element L1An input/output connection G/ZCD of the integrated switching circuit IG is connected to the control electrode of the switching element S1. The input/output connection G/ZCD is to the output of a current source I_{start}. A switching element S2 is connected between the control electrode of the switching element S1 and the input connection K2.

D6 thus discloses a common input and output connection (G/ZCD) for controlling the switch and recording operating parameters.

However, neither feature 7.3.2 nor feature 7.4 are directly and clearly here either.evident

The defendants themselves state (Annex WKS 4; expert opinion) that a zero crossing of the charging coil current leads to a change in the voltage ripple (du/dt value) of the output voltage, but that detection is very complex in terms of measurement technology and also depends on the filter effect of the low-pass filter. In the case of assumed dynamic loads on the PFC circuit, a clear detection of the zero crossing is not possible. Thus, there is no indication of a detection at the OVP connection. Furthermore, the applicant agrees that the superimposed voltage signals serve to monitor an overvoltage, but not to control the switching process. Furthermore, the information on p. 4, lines 3-14, which describes the circuit at the G/ZCD receipt, does not contain any indications of decoupling.

4. D8 (Adragena)

The defendants - who have the burden of proof in this respect - do not explain comprehensibly why the current mirror should constitute a decoupling element. It is not clear why a current mirror should be able to decouple two signals.

III. Inventive activity

1. Scale

According to Art. 56 EPC, an invention is considered to involve an inventive step if it is not obvious to a person skilled in the art from the prior art.

According to the Munich central division (UPC_CFI_1/2023 (CD Munich), decision of 16 July 2024 - Sanofi v. Amgen), which the Düsseldorf local division has already endorsed decisions (UPC_CFI_363/2023, decision of 10 October 2024, ORD_598458/2023 in past - Seoul Viosys v. expert), the assessment of inventive step always requires a assessmentcase-by-case , taking into account all relevant facts

and circumstances. An objective approach must be taken. The subjective ideas of the applicant or inventor are irrelevant. Only what the claimed invention actually contributes to the state of the art is relevant.

The inventive step is to be assessed from the point of view of the person skilled in the art, who may be called , on the basis of the entire state of the art, including general technical knowledge. also a person skilled in the artIt must be assumed that the person skilled in the art had access to the entire generally accessible state of the art at time. The decisive factor is whether the claimed subject-matter is derived from the prior art in such a way that the person skilled in the art it on the basis of the relevant would have , found his knowledge and skillse.. gby obvious modifications of what is already known. In order to assess whether a claimed invention was obvious to a person skilled in the art or not, it is necessary first to determine a starting point in the prior art. Reasons must be given as to why the person skilled in the art a certain part of the prior would . consider art to be a realistic starting pointA starting point is realistic if its teaching would have been of interest to a person skilled in the art who, at the priority date of the patent in suit, was seeking to develop disclosed , i.e. having a similar basic problem to the claimed invention (see a product or process similar to that in the prior artUPC_CoA_335/2024, Order of 26 February 2024, p. 34 - Nanostring v. 10x Genomics, at
"cc" in the original German version, "For a person skilled in the art who the priority date of the patent in suitfaced with the task at, [...] D6 was of interest"). There may be several rea- listic starting points, whereby it is not necessary to determine the "most promising" starting point. If the claimed subject-matter is compared with the prior art after interpretation, the question arises as to whether it would have been obvious for the person skilled in the art to arrive at the claimed solution on the prior art which in view of the underlying problem. basis of a as a disclosure of the is to be regarded realistic starting point If it was not obvious to arrive , at this solutionthe claimed subject-matter fulfils the requirements of Article 56 EPC.

In general, a claimed solution is obvious if, skilled person based on the prior art, would be motivated (i.e. would have an incentive, see the CoA in NanoString v. 10x Genomics, the p. 34) to consider the claimed solution and use it as a next step ("next step", see UPC_CoA_335/2024, Order of 26 February 2024, p. 35, second paragraph - Nanostring
v. 10x genomics) in the development of the state of the art. On the other hand, it may be relevant whether the skilled person would have . anticipated particular difficulties in carrying out the next step or stepsDepending on the facts and circumstances of the case, it may be permissible to disclosures from subject to an overall assessment.the prior art

technical effect or advantage by the claimed subject-matter compared to the prior art may an indication of inventive step. A feature arbitrarily from selectedseveral possibilities cannot generally contribute inventive step. A retrospective view must be avoided. The question to of inventive step should not be answered by retrospectively searching for prior art disclosures from which this solution be derived ("combined") could .while knowing the patented subject-matter or the patented solution

2. Technical problem and task

As explained, the patent in suit does not explicitly criticise the prior art, but formulates against its background in paragraphs [0013] and [0014] the technical problem of reducing the number of

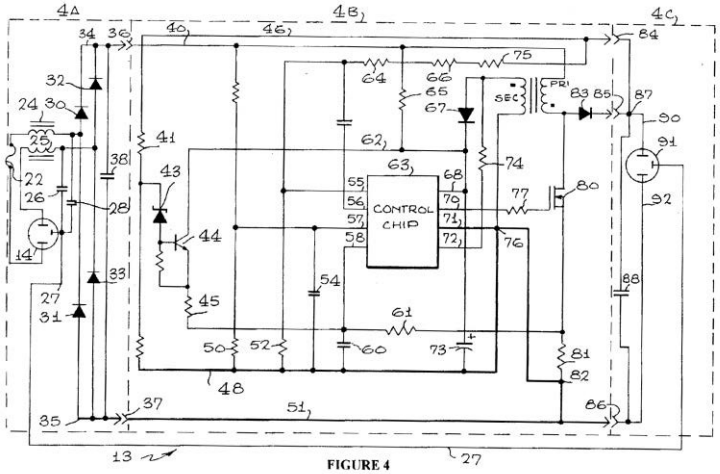
The aim is to reduce the number of acquisition points for the measurement signals in order to reduce the number of pins required for an ASIC as a control and regulation circuit.

The task underlying the patent in suit is therefore to the number of detection points, reduce boost PFC circuit that operates in zero-crossing mode.i.e. the required pins, of a control and regulation circuit in a

3. D5 (Stevens) in combination with D3, D4 and D6

D5 deals with the technical problem of providing a device that is connected between the power source of the power grid and an electrical consumer in order to limit the energy demand of the electrical consumer to its average demand. This eliminates the need for the electricity grid to cover consumer. According to the information in column 3, lines 33 to 60, the device described in D5 is intended to the 's peak power demandfurther ensure that an uninterruptible power supply provided in the event of a failure of the power grid, that no harmonics of the grid frequency are , reflected back to the power line as a result of the energy consumptionthat the power factor of the load on the power line is maintained at or near unity and that the crest factor of the current at or near 1.414 comparable to is a sine wave.

As shown in Figure 4 of D5 reproduced below, which was submitted by the defendants with coloured highlighting as Annex D5a, and can be seen from the information in column 6, lines 4 to 25,



the capacitor 73 is via the line 40 and the when the power supply is switched on for the first timecharged . resistor 65 This supplies the control chip 63 with operating current . The control chip 63 is designed in such a way that it only draws current when the capacitor at a terminal 6873 has . reached a predetermined voltageThis allows to the resistor 65 have a high value and low power, as the operating current for the control chip 63 is not dissipated through it. As soon as the capacitor 73 is sufficiently charged to maintain operation, the switching process is initiated so that the secondary winding of the coil 78 can supply the capacitor 73 and other parts of the circuit with operating current via the diode 67.

D5 recognisably does not deal with the problem the patent in suit. Insofar as the

If, however, person skilled in the art D5 were to use this as a realistic starting point, it does not disclose any detection of the zero crossing of the coil current (feature 7.3.2) at the same receipt as the detection of the switch current (feature 7.3.1). With regard to the task of the number of detection points (required reducing , it is not pins) of a control and regulation circuit in a boost PFC circuit that operates modein zero-crossing clear why the skilled person should have an incentive to modify the circuit design based on D5.

The control chip installed in the D5 only to record the operating parameters at different designed receipts. It is not clear what incentive the skilled person should the have to replace . different inputs with one receiptEven if one assumes defendants that the skilled person always strives for a simplified design of circuits, it is not apparent what information the skilled person could take from D5 in order to arrive at the solution according to the invention.with the

The skilled person no reason to D5 with examine together and D6.one of the printed documents D3, D4

As explained, the diodes known 154 and 156 from D3 do not detect a zero crossing, so that the function of a decoupling element cannot be attributed to them. D4 does not show any double assignment of a receipt, which is why no decoupling element within the meaning of the patent in suit is disclosed either.

Although D6 discloses a common input and output terminal G/ZCD for controlling the switch and detecting operating parameters, it does not indicate that the zero crossing of the current flowing through the charging coil as an operating parameter of the boost PFC circuit is detected (feature 7.3.2), and consequently also not to a decoupling element for decoupling the detection of the switch current and the detection of the zero crossing of the current flowing through the charging coil (feature 7.4)during the periods in the switch is open .

Therefore, the skilled person would have not arrived at the subject-matter of claim 7 of the patent in suit in an obvious way even if the disclosure of D5 were considered with one or even more of the documents D3, D4 and D6.together

4. D7 (Onsemi) in combination with D3, D4 and D6

D7 describes the electronic component NCP1601, which is a controller developed for power factor correction (PFC) circuits. The controller operates in Discontinuous Conduction Mode (DCM) with a fixed frequency and in Critical Conduction Mode (CRM) with a variable frequency and utilises the advantages of both operating modes. DCM limits the maximum switching frequency. This simplifies the design of the upstream EMI filters. CRM limits the maximum currents of the diodes, MOSFETs and inductances of the boost stage. The power factor of the controller is equal to 1 in DCM and CRM mode. The controller is designed to minimise the number of external components required and has high safety features that make it suitable for robust and compact PFC stages.

A typical circuit diagram for the use of the NCP1601 controller, which was submitted defendants with colour highlighting as Annex D7a, is reproduced belowby the .

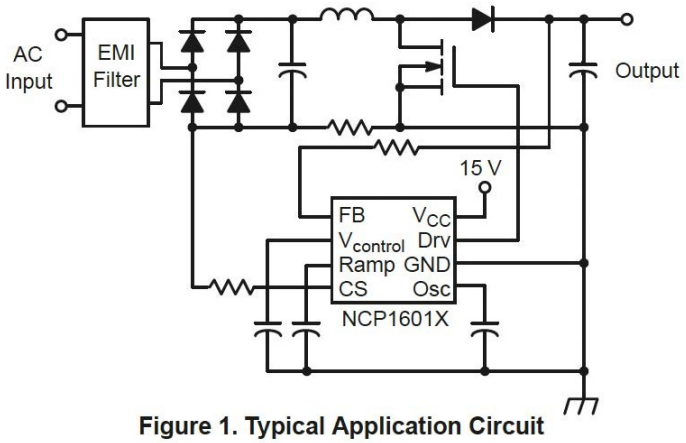


Figure 1. Typical Application Circuit

There is no reference to a decoupling element within the meaning of the patent in dispute either in the circuit diagram or elsewhere in D7.

It is therefore irrelevant whether D7 was , published before the priority datewhich is disputed between the parties, and is therefore to be considered as prior art. Even if one this wanted to , it assume in favour of the defendantis not apparent where the skilled person - avoiding view from the perspective of the patent in dispute - should have an incentive a retrospective to implement . a double assignment of a pinEven if an incentive appears is assumed, it questionable how an implementation in the circuit should lead to a decoupling element according to the invention. As already explained, citations D3, D4 and D6 do not show any decoupling elements within the meaning of the patent in suit. Thus, the person skilled in the art will also not reach an obvious the subject-matter of claim 7 of the patent in suit in manner if D7 is considered with one or even more of the printed documents D3, D4 and D6.together

5. D9 (Green Power) with D3, D4 and D6

D9 describes a method for realising an APFC converter that forces the system in Borderline to remain Conduction Mode (BCM) without sampling converter. D9 also describes that, with a small adjustment, the control methods also the voltage at the receipt of the canbeused for APFC converters that in CCM mode, as can be seen from the information on page 16, last paragraph of D9.

As shown in Figure reproduced below, 9 of D9 which by was submitted the defendants with coloured highlighting as Annex D9a and shows the structure of an embodiment in BCM mode, and can be seen from the information on page 25,

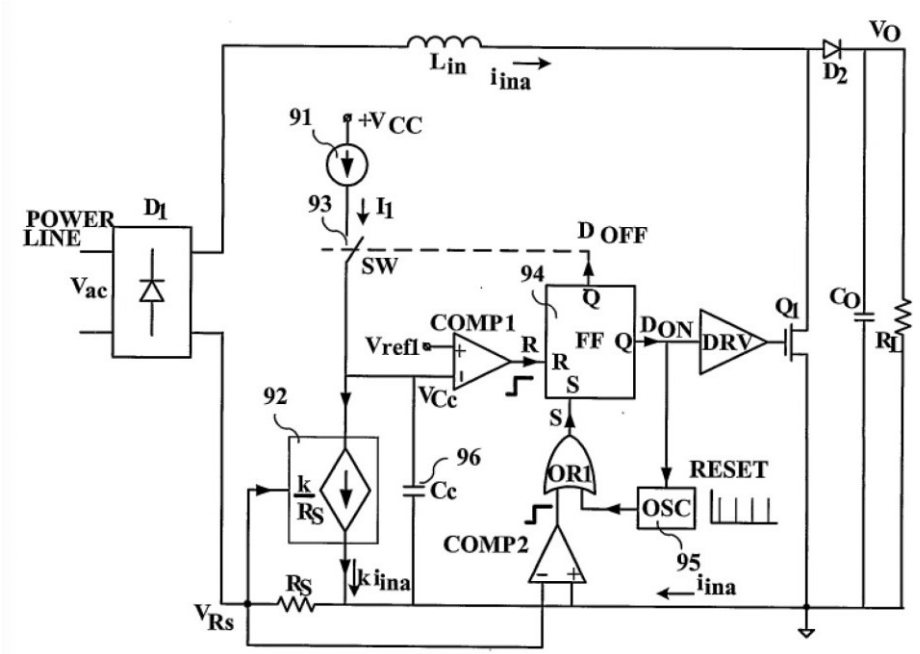


Fig. 9

two current sources feed a capacitor (Cc) 96, namely an independent current source 91, which generates current, and a dependent current source 92, which a current proportional to generates . The dependent current source 92 is by the voltage at the measuring resistor RS $_{iina}$controlledthrough which $_{iina}$ flows. The current source 91 is via connected to the capacitor 96 is conductive . The signal a switch 93 (SW), which during the time $_{TOFFDoff}$ for the time $_{TOFF}$ and the complementary signal $_{DON}$ are generated by a flip-flop 94 (FF). The flip-flop 94 is by set and reset . two comparatorsThe comparator Comp1 generates a reset signal when the capacitor voltage falls below a reference voltage. The flip-flop 94 is set when the input current drops . to zeroAn independent oscillator 95 (OSC) is used initiate and/or trigger normal operation. Oscillator 95 is inactive during normal operation because its frequency is constant and lower than the frequency of the signal at the output of flip-flop 94, whose signal resets oscillator 95.the circuit at startup or in the event of a stall, i.e. resumption of

However, D9 does not reveal a common receipt. Flip-flop 94 in D9 receives signals from two separate receipts (R and S). There is no common detection. In this respect D9 provide with ,does not any the skilled person indication of a decoupling element within the meaning of the patent in suit that could separate signals.

The skilled person thus does not arrive at the subject-matter of claim 7 of the patent in suit in, even if D9 is considered together with one or even more of the printed documents D3, D4 and D6. an obvious way

6. D6 (Malei) in consideration of the general expertise

In view of the above interpretation of the patent in suit, D6 is in any event incapable of disclosing a decoupling element according to the invention, taking into account the common general knowledge.

7. D10 (Samsung) with D12 (Pansier)

Even if one assumes - the defendant has not sufficiently demonstrated to what extent a synopsis of the writings shows all the characteristics of claim 7 at issue.an incentive for the skilled person - which is not apparent to the court

8. D3 in the context of inventive step

Insofar as the defendant wants to be understood the inventive step, it is already questionable whether this is not already late (see Reply UPC_CFI_265/2023, CD Paris, judgment of 29 July 2024, para. 23 et seq.). Apart from this, there is a lack of clarity in the submission as well as a lack of substantiation.the statements on D3 in the Reply as a further attack on

IV. Subclaims 8 to 10

Since claim 7 is novel and inventive, so are the dependent subclaims 8 to 10.

V. Auxiliary requests for amendment of the patent in suit

Since the motion to dismiss has already been with regard successful plaintiff, the plaintiff's auxiliary motions on the counterclaim are no longer relevant to the decision.the disputed claim of the

D. Injury

The infringement action is the merits not successful onbecause the contested embodiment does not fulfil feature 7.4 of the patent in suit. Since this feature is already lacking, no further comments on the other are required for lack of relevance to the decision.features

The chamber is unable to recognise that the capacitor C3 in the present case causes a complete separation of the signal path for measuring the zero crossing in the attacked embodiment, so that no more signals are transmitted to the measurement input pin 1 of the controller U1 (ASIC).

It is undisputed between the parties that in the case of the closed switch, voltage signals from the signal path intended for current zero crossing detection at pin 1 of the controller are present U1 (ASIC). The capacitor is connected in between and passes on voltage changes at the switch, namely any voltage change that generates capacitor. a current in the Both the capacitor C3 with resistors R5 and R8 and the resistors R10A- D are permanently connected to the same pin of the control unit without interruption. The pin

of the control unit receives a signal from even when the switch is closedthe current flowing through the capacitor C3 . The contested embodiment utilises the fact that the measurement signal from capacitor C3 that results when the switch is open occurs when the switch is open and therefore not simultaneously with the actual measurement signal for the current flowing via the switch. According to the defendant, the measurement signal from capacitor C3 forms such a clear peak when the switch is closed and its voltage therefore rises very quickly that the control unit this and the simultaneous information on the current via can . handlethe switchNevertheless, both "measuring units" - capacitor C3 with resistors R5, R8 and 10 and resistors R10A-D - are always continuously connected pin. to the control unit at one The applicant merely states here that the voltage changes only slightly at best when switch Q 1 is closed and that either no current or only a very small current flows, which is too weak to distort switch current signal .the arriving at the receipt at the same time

The capacitor thus does not fulfil the requirements of the decoupling element in accordance with the patent in suit within the meaning of feature 7.4. According to the above interpretation of the scope of protection, the patent in suit understands to mean decoupling complete isolation, so that only one current signal arrives at one pin of the control unit at time. aThis is not embodiment the case because with the contested the capacitor to every reacts the switch and then voltage change across applies , a voltage level via the signal pathregardless of whether the switch is or closed.open

E. Basic cost decision

Pursuant to Art. . 118.5 69 para. 1 UPCA RPin conjunction with R. R. 118.5 RoP, a basic decision on costs had to be made.

Since the plaintiff is unsuccessful in its action for infringement in its entirety, it must bear the costs in this respect. As the defendants are unsuccessful in full with regard to the counterclaim, it is justified to order them to pay the costs in full and to each pay half of the costs.

Pursuant to Art. 69 para. 1 RoPare , the costs up to an to be borne . upper limit set in accordance with the Rules of ProcedureWith an amount in dispute of EUR 1,000,000 (claim and counterclaim), the table adopted by the administrative exclusion on 24 April 2023 on the basis of R. 152.2 RoP provides EUR 112,000, which was to be set in the present case.for an upper limit for the recoverable costs of up to

DECISION:

I. The action is dismissed.

II. The action for annulment is dismissed.

III. The plaintiff is ordered to the costs of the infringement proceedings.

The defendants shall each bear .half of the costs of the counterclaim

IV. The amount in dispute for the action and the action for annulment is set EUR 500,000.00 at each.

V. The upper limit of the reimbursable representation costs for the action and the action for annulment is set at a total of EUR 112,000.00.

DETAILS:

Main file reference ACT_590302/2024 and CC_16360/2024

UPC number: UPC_CFI_459/2023

Type of proceedings: Action for infringement and action for annulment

Düsseldorf on 7 March 2025 NAMES
AND SIGNATURES

Legally qualified judge Dr Thom

Presiding Judge Klepsch

Legally qualified judge Agergaard

Technically qualified judge Schober

For the Deputy Chancellor Strysio

INFORMATION ON THE APPOINTMENT:

An appeal against this decision may be lodged with the Court of Appeal by any party whose applications have been wholly or partially unsuccessful within two months of service of the decision (Art. 73 para. 1 UPCA, R. 220.1 (a), 224.1 (a) RoP).

Information on enforcement (Art. 82 UPC Agreement, Art. 37 para. 2 EPGS, R. 118.8, 158.2, 354, 355.4 RoP):

A certified copy of the enforceable decision is issued enforcing party, R. 69 RegR.by the Deputy Registrar on application by the

This decision was announced . Judge Dr Thom, legally qualifiedin open court on 7 March

2025