

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHIO OKAMURA

Appeal No. 96-3944
Application 08/041,543¹

ON BRIEF

Before THOMAS, KRASS and LEE, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1, 4, 6, 9, 12, 14, 15, 17 and 19 through 23. Claims

¹ Application for patent filed April 2, 1993.

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24 and 25 have been allowed by the examiner and the examiner has indicated that claims 7 and 18 are also directed to allowable subject matter.

The invention pertains to storage capacitor power supplies for charging capacitor blocks. More particularly, a charge limiting circuit is employed for detecting the voltage across each capacitor and, when the detected voltage has reached a reference value, cutting off the charging circuit.

Representative independent claim 1 is reproduced as follows:

1. A storage capacitor power supply adapted to store electricity in a capacitor block consisting of a plurality of capacitors connected to supply electric power to a load, said power supply comprising:

the capacitor block connected with the load and supplying electric power directly to the load;

a charging circuit for electrically charging the capacitor block;

a charging power supply connected with the capacitor block via the charging circuit; and

a charge-limiting circuit which detects the voltage developed across each capacitor and limits charging of the capacitor block if a detected voltage reaches a given reference value, wherein said charge-limiting circuit has a switching means connected in series with said charging circuit and cuts off the charging circuit by sensing that the detected voltage has reached the reference value.

The examiner relies on the following references:

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Meinhold

4,303,877

Dec. 1, 1981

Rose, "Performance Characteristics of Large Surface Area Chemical Double Layer Capacitors," Proc Int Power Sources Symp., Vol. 33 (1988) pp. 572-592.

Claims 1, 4, 6, 9, 12, 14, 15, 17 and 19 through 23 stand rejected under 35 U.S.C. 103. As evidence of obviousness, the examiner cites Meinhold with regard to claims 1, 4, 6, 9 and 20 through 23, adding Rose with regard to claims 12, 14, 15, 17 and 19.

Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

OPINION

We have reviewed the evidence before us, including, inter alia, the arguments of appellant and the examiner and, based on such a review, we will sustain the rejection of claims 1, 4, 6, 9, 12, 14, 15, 17 and 19 through 23 under 35 U.S.C. 103.

With regard to claims 1, 4, 6 and 9, the examiner contends that Meinhold teaches a circuit for protecting against overcharge of a series of battery cells having a bypass means including a switch for bridging the cells upon a maximum charge. The examiner recognizes that Meinhold fails to show the circuit being used to charge capacitors, as claimed, but contends that it

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would have been obvious to replace the battery cells with capacitors as they are both known electrical storage devices.

With regard to claim 1, appellant asserts that the difference between the claim and that taught by Meinhold is more than that Meinhold is concerned with batteries while appellant is concerned with capacitors.

More specifically, at page 6 of the principal brief, appellant contends that

Meinhold does not disclose a charge-limiting circuit that cuts off the charging current when the detected voltage has reached a referenced value indicative of full charge. Meinhold, rather, bypasses storage batteries when the charge [sic, charge] exceeds a threshold voltage...

This argument is unpersuasive because if Meinhold bypasses the storage batteries when a full charge, i.e., a threshold voltage, is indicated, then this procedure results in a cut off of the charging current to the battery.

Further down the same page, appellant appears to recognize that Meinhold does, indeed, disclose a cut off circuit but contends that "that circuit takes the batteries out of the charging circuit when a negative discharge voltage is detected," this negative discharge voltage being, in actuality, a charging voltage. Thus, contends appellant, "Meinhold takes the battery

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out of the circuit when charging begins, not when charging is completed."

While Meinhold does take some battery cells out of the circuit [see column 4, lines 35-40], this is for synchronization purposes since some of the cells are of a different charged state than other cells. Meinhold is concerned with both charging each storage cell to its maximum capacity and preventing over discharging of each storage cell of the battery. When a storage cell reaches its maximum capacity, the protective circuit of Meinhold shunts across each cell which causes a bridge, or a short of each cell, preventing overcharging of the cell. Thus, while some cells may be taken out of the circuit in Meinhold, while others are being charged to maximum value, we fail to see how this results, as appellant contends, in taking "the battery out of the circuit when charging begins, not when charging is completed." If every cell of the battery were taken out of the circuit when charging begins, there would appear to be no point in charging since there would be nothing to charge. Accordingly, appellant's argument that Meinhold takes the battery out of the circuit when charging begins is not persuasive.

Appellant further argues [pages 6-9 of the principal brief] that the differing characteristics between capacitors and

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batteries would have made the substitution of the former for the latter in Meinhold unobvious. While we recognize many of these differences, we find no language in claim 1 indicative of specific capacitor characteristics which are not also characteristics of a battery. Therefore, we are in agreement with the examiner that, at least with regard to the claimed subject matter, the battery cells of Meinhold and the capacitors of the instant invention would appear to have been interchangeable in the sense that they are both electrical storage devices which are rechargeable.

With regard to claim 4, appellant argues [page 9 of the principal brief] that Meinhold does not disclose a "full charge detecting circuit" or the performance of a logical operation on the output signals from the charge-limiting circuit. We disagree. Since Meinhold detects when a cell is charged to "maximum capacity," this is clearly a disclosure of a "full charge detecting circuit." Further, since the detection of such maximum capacity, or full charge, results in a cut off of the charging circuit to a particular cell or cells, i.e., the cell is switched to be in or out of the circuit, this clearly is a "logical operation," as broadly claimed.

Claim 6 falls with claim 4.

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With regard to claim 9, this claim brings in the "residual electricity detecting circuit" and appellant argues [page 10 of the principal brief] that the applied prior art fails to teach anything that "even approaches this circuit." However, as we apply Meinhold to the broad language of claim 9, in our view, Meinhold does, indeed, disclose that which is claimed. As above, we treat the claimed capacitors as obvious equivalents to the battery cells of Meinhold. Looking at either Figure 4 or 5 of Meinhold, taking Figure 4 as exemplary, Meinhold discloses a circuit which protects cells from overcharging or overdischarging but before a full charge is reached, for example, the energy, or electricity, within the storage device may be considered "residual electricity," as claimed. The term "residual" does not appear to add much substance to the claim but, to the extent that it does, it may be considered an amount of a quantity remaining. Thus, Meinhold implicitly has some "residual electricity" in the battery cells during charging and/or discharging and the detecting circuit, which detects the overcharge condition, for example, may then be considered to be a "residual electricity-detecting circuit," as claimed. Referring to Figure 5 of Meinhold, that detection circuit comprises applying the voltage across each cell (i.e., capacitor) 4 to a series combination of a

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voltage regulator 1 (appellant identifies his voltage regulator in Figure 10B as zener diode D2), which is a zener diode, and a detector device, heating element 2. As heating element 2 heats up, there would appear to be a greater amount of "residual electricity." Thus, the temperature of heating element 2 in Meinhold would certainly appear to be a good indicator of "residual electricity," as claimed.

We do note, for the record, that the examiner never addressed the limitations of claim 9 concerning the residual electricity-detector circuit so we are at a loss as to the examiner's exact position thereon.

With regard to claims 12 and 19, appellant argues that these claims are allowable for the same reasons as claim 1. Since we treated claim 1, supra, claims 12 and 19 will fall therewith. Appellant does mention, at page 11 of the principal brief, that claim 12 also adds the limitation of a plurality of "double layer capacitors" and that while Rose does describe such capacitors, there is no suggestion therein of the need for the special charging circuits. However, the teaching of the charging circuit is the purpose of the primary reference to Meinhold. We have already found that it would have been obvious to employ capacitors in place of the battery cells taught by Meinhold.

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Rose merely teaches the use of a particular type of capacitor and we hold that it would have been obvious, within the meaning of 35 U.S.C. 103, to have charged such capacitors, i.e., double layer, in place of Meinhold's cells.

With regard to claim 14, appellant argues [page 11 of the principal brief] that in addition to the cutoff of current, each capacitor is provided with a bypass. Clearly, this is the case with each cell in Meinhold as each fully charged cell is cut out of the circuit.

With regard to claim 20, we think it is clear that transistors were known switches and it would have been clearly obvious to use transistors for switching to a bypass when full charge has been reached.

All other claims fall with those specifically mentioned since appellant's arguments in support thereof depend on the previous arguments made regarding the specifically mentioned claims.

The examiner's decision rejecting claims 1, 4, 6, 9, 12, 14, 15, 17 and 19 through 23 under 35 U.S.C. 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)

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AFFIRMED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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ERROL A. KRASS)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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