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Bezeichnung der Erfindung: Device control system
Title of invention:
Titre de l'invention :
Klassifikation / Classification / Classement : H 04 M 11/00

ENTSCHEIDUNG / DECISION
vom / of / du 10 December 1985

Anmelder / Applicant / Demandeur : Western Electric Company, Incorporated
Patentinhaber / Proprietor of the patent /
Titulaire du brevet :
Einsprechender / Opponent / Opposant :
Stichwort / Headword / Référence :
EPÜ/EPC/CBE Article 56
"Inventive step"

Leitsatz / Headnote / Sommaire

Europäisches
Patentamt

Beschwerdekammern

European Patent
Office

Boards of Appeal

Office européen
des brevets

Chambres de recours



Case Number: T 11 / 84

DECISION
of the Technical Board of Appeal 3.5.1.
of 10 December 1985

Appellant: Western Electric Company, Incorporated
222 Broadway
New York N.Y. 10038

Representative: Dipl.-Ing. Paul Günter Blumbach
Sonnenbergstr. 43
6200 Wiesbaden 1

Decision under appeal: Decision of Examining Division 059 of the European Patent
Office dated 24 August 1983 refusing European patent
application No 80 102 596.6 pursuant to Article 97(1)
EPC

Composition of the Board:

Chairman:
Member: G. Korsakoff
Member: P. K. J. van den Berg
F. Benussi

I

Summary of Facts and Submissions

- I European patent application No. 80 102 596.6 filed on 10.05.80 (Publication No. 0 019 245) claiming a priority of 14.05.79 (US) was refused by a decision of the Examining Division 059 of the EPO of 24.08.83. That decision was based on Claim 1 filed at oral proceedings on 20.06.83 and Claims 2-4 filed on 17.07.82.
- II The reason given for the refusal was that the subject-matter of the claims lacked inventive step with regard to US-A-4 021 615.
- III The Applicant lodged an appeal against this decision on 20.10.83. The appeal fee was paid on the same day. The Statement of Grounds was filed on 24.12.83.
- IV In his Statement of Grounds the appellant argued as follows:

The cited prior art document US-A-4 021 615 discloses a telephone switching system connected to the telephone lines in parallel with an extensive amount of auxiliary switching equipment which is used for energy control purposes.

This auxiliary switching equipment transmits an audio frequency to selected energy control devices to disable these devices for load control purposes. The cited telephone switching system itself, i.e. the private automatic branch exchange (reference numeral 10 in figure 1 of the cited patent) does not play any part in the transmission of the audio frequency to the selected devices.

The cited patent discloses in figure 2 a shift register peripheral to the private branch exchange (PBX) for identifying the lines to be alerted via the application of the audio frequency. After the shift register is loaded, the audio frequency is applied to all of the identified lines for 50ms. The application of 50ms of tone indicates that the detection apparatus used in the cited patent is a relatively slow acting device. A continuous 50ms tone has to be applied on a periodic basis for the detection apparatus to function properly.

This 50ms tone cannot be supplied on such a periodic basis through the telephone switching system since this would cause a significant increase in the traffic handled by the switching system, causing increased blocking. If the telephone switching system were a space division switch, one network connection per controlled device and per periodic tone application would have to be established to effect the required device control. Exactly the same situation applies if a time division network is provided in the telephone switching system since 50ms of tone must be applied to each controlled device on a periodic basis. This 50ms tone is not only greater than the time of a time slot, but is also greater than a frame of time slots.

Applicant's detecting device is as in the prior art activated by a periodically applied tone. While Applicant's improved detecting device is faster than the prior art detecting device so that shorter tones may be applied, the use of such shorter tones reduces the holding time on telephone traffic but in no way solves the basic problem of one switching network connection per period per device to be controlled. Therefore, even with faster detecting devices, a substantial increase in the number of call establishments and the concomitant switching network connections in the telephone switching system would cause blocking in the telephone

network. This is because a significant amount of processor real time is required in the PBX for the establishment of each and every unique call between a pair of available end points and the use of substantially all of the available time slots. Therefore, the energy control arrangement of the cited patent, even if it were supplied with improved detecting devices would still burden the telephone switching system with an individual network connection for each call to provide the tone to a control device.

The solution of separate switching network with its own controller as disclosed in the cited patent is a reasonable solution to this problem given these limitations. The cost of this additional switching network with its controller is very high considering the fact that it is operating in parallel with the existing telephone system. There were no obvious solutions to this problem until Applicant devised the disclosed system wherein all fast acting devices to which a tone is to be applied are connected in the same time slot in the existing telephone switching system. The use of a single time slot in a PBX was not known in the art and presented a radical departure from the existing energy control systems as outlined above. The position of the Examining Division that the use of a single time slot was well known in the art or was obvious at the time is not correct. Applicant knows of no art which shows such an arrangement. Additionally, if such an arrangement were obvious, it would have appeared in one of the numerous energy control arrangements that were placed on the market about the time of the cited prior art system, since the economic advantage of such an arrangement is overwhelming. The absence of such a solution in the field indicates that such an arrangement not only was not known but was not obvious.

V In the communication of 19.09.85 accompanying summons to oral proceedings before the Board of Appeal which had been

requested by the Appellant the Rapporteur of the Board of Appeal set out objections against the then valid claims. These claims were the same as those refused by the Examining Division.

The objections made mainly concerned lack of inventive step with regard to the cited US-A-4 021 615 and a further document introduced into the procedure for the first time. This document concerns an article by R.C. Gibbs and P.A. Mitchell under the title "CDSSI - A small PABX for the BPO rental range" in the Proceedings of the International Conference on Private Electronic Switching Systems, London, 10-12 April 1978, in the following referred to as "Gibbs".

The Rapporteur's communication referred to page 49, left column, second paragraph and in particular the fourth paragraph of this article, according to which each signalling tone appears at a fixed time slot position on the TDM highway into the switch and the CPU therefore has only to provide the appropriate information to the connection store to connect a given port to a particular tone.

VI In his reply received on 06.11.85 to the Rapporteur's communication the Appellant filed a new set of Claims 1 and 2 to replace the foregoing Claims 1-4.

VII (i) At the oral proceedings of 10.12.85 the Appellant emphasized once more that US-A-4 021 615 shows an energy control system that is superimposed upon the private telephone system, only using the telephone lines to subscribers but not the exchange, which implies the need for much extra equipment.

On the contrary the energy control system according to the invention, he said, is integrated within the telephone system, really utilising its exchange.

The Appellant furthermore alleged that assuming the exchange of US-A-4 021 615 to be a time division multiplex (TDM) exchange the present invention presents a tremendous simplification and saving of equipment which had been entirely overlooked by the inventors of the prior art of this US patent. The Appellant also emphasized the use of a time slot for the audio control signal and in particular the use of only one time slot for that purpose, the present application being limited to only one such time slot.

He alleged that according to Gibbs, eight time slots are used for tone signalling, so that the use of only one such time slot according to the invention exhibits a technical advance with respect to Gibbs.

The Appellant remarked that the present invention has the advantage that it allows the audio control signal to be sent to a plurality of subscribers in parallel at the same time; he, however agreed that this is also the case according to US 4 021 615, as shown by its Figure 2.

Upon a question of the Board concerning the time frame used in the invention, the Appellant confirmed that the TDM system of the invention uses the standardised time frame of 125 μ sec which represents a value also mentioned in Gibbs.

- (ii) At the oral proceedings there was full agreement between the Appellant and the Board of Appeal about what the characterising part of Claim 2 filed 06.11.85, i.e former Claim 4, is intended to express, apart from

its actual wording and independently of the question whether its formulation is based on "positive logic" or on "negative logic".

This agreed intended meaning of Claim 2 of 06.11.85 is summarised as follows:

(a) the energy control at a subscriber site will only be switched on, if both the audio frequency control signal is present and the telephone is on hook and then only when this coincidence has persisted for at least the duration of a first time interval (2 seconds);

(b) once the energy control has been switched on at a subscriber site, it will remain switched on for at least the duration of a second time interval (2 minutes), whatever happens to the hook and independently of the presence or absence of an audio frequency control signal during this second time interval; this measure being intended to prevent cycling the load more often than every two minutes;

(c) at the end of this second time interval the energy control at a subscriber site will be switched off unless there is a new coincidence of telephone on hook and audio frequency control signal present which coincidence has lasted already for more than two seconds before the end of the second time interval arrives. This means that in any case, when at the end of the second time interval either the telephone is off hook, or the audio frequency control signal fails or both (i.e. telephone off hook and audio frequency control signal absent) the energy control will be switched off.

VIII The Appellant requested the grant of a European patent on the basis of Claims 1 and 2 filed on 06.11.85 which claims read as follows:

1. A control system for overriding the normal control of devices (L00-Ln), each of which is located at one of a plurality of sites, each of the sites having associated with it a telephone line (T00-R00), the system comprises: circuitry (101) for producing an audio frequency having a predetermined value; a plurality of control circuits (EC00-ECn), associated on a one-to-one basis with the device (L00-Ln), wherein each of the control circuits (EC00-ECn) includes: a detector (200) for providing an indication of the presence of the applied audio frequency signal on the associated telephone line (T00-R00), wherein each of the detector circuits (200) is connected to the associated telephone line (T00-R00); and switch circuitry (303) responsive to the detector (200) indication for overriding the normal control of the device (L00) associated with the control circuit (EC00); a distribution arrangement (100) for concurrently applying the audio frequency to each of the telephone lines associated with a site containing one of the device (L00-Ln) to be overridden; characterized in that the distribution arrangement (100) is a time division switching network in a stored program time division multiplex private branch telephone exchange providing a plurality of time slots for connections through the network to each of the recited telephone lines during one particular time slot, whereby the normal telephone traffic is still being processed.

2. A control system in accordance with Claim 1, characterized in that the control circuit (EC00) includes: switchhook status means (202) responsive to the on-hook

condition of the associated communication pair (T00, R00) for generating an on-hook status signal; time delay circuit (301) responsive to the concurrent persistence of both the on-hook status signal and the detector indication for a greater than a first predetermined interval of time (2 seconds) for enabling the switch circuitry (303); wherein the time delay circuit (301), having enabled the switch circuit (303), is unresponsive to the presence/absence of both the on-hook status signal and the detector indication for a second predetermined interval of time (2 minutes); and wherein the time delay circuit (301) is responsive, after the elapse of the second predetermined interval of time (2 minutes), to the absence of the onhook status signal or the detector indication for greater than the first predetermined interval of time (2 seconds) for disabling the control circuit (EC00).

Reasons for the decision

1. The appeal complies with Articles 106-108 and Rule 64 EPC and is, therefore, admissible.
2. A control system according to the prior art part of Claim 1 is known from US-A-4 021 615, i.e. all the features of the prior art part in combination are known from this single document.

In particular the features concerning a distribution arrangement for concurrently applying the audio frequency to each of the telephone lines associated with a site containing one of the devices to be overridden, is illustrated by Fig. 2 of this document. Each bistable stage of the shift register 3 0 indicated is associated via its own gate with one of the sites, its state indicating whether energy has to be conserved (binary "/") or not (binary "0") in that associated site. The binary information loaded into the shift register

is available in parallel and audio frequency control signals from one common tone burst source are fed to the sites also in parallel, as is confirmed in the Statement of Grounds.

US-A-4 021 615 shows an energy control system superimposed on the private telephone system, using the telephone lines to transmit the audio frequency control signal to subscriber sites, but not using the exchange of the system.

3. The characterising part of Claim 1 implies that the energy control system is integrated within the telephone system and is using its exchange. In US-A-4 021 615 the PABX (private automatic branch exchange) is not further specified. It may be a TDM exchange as suggested by the Appellant but need not be.

Claim 1 is limited to TDM. The energy control system of US-A-4 021 615 may be combined with any telephone system and in that sense is more flexible than the system according to Claim 1.

Above all US-A-4 021 615 clearly teaches how useful it is to combine a control system for overriding the normal control of devices such as for heating each of which is located at one of a plurality of sites with the telephone system interconnecting these sites.

The known energy control system of this document is not adapted to any specific type of telephone system or vice versa.

The Board of Appeal, however, considers it an obvious aim for a person skilled in the art to do so, i.e. it is considered as obvious to try to adapt the energy control system and the telephone system to each other.

The use of TDM in private telephone branches was already an established fact at the priority date of the present application as shown by Gibbs. Therefore it is obvious to contemplate the combination of an energy control system and a TDM telephone system; the Appellant even thinks this combination may be considered as known as he states that the telephone system of US-A-4 021 615 may be a TDM system.

4. Once the obvious combination of an energy control system and a TDM telephone system is being contemplated by a person skilled in the art, the features of the characterising part of Claim 1 offer themselves to him as a matter of course, since the philosophy of TDM exists exactly in the notion that every space parameter is being translated into an element of time which consists of a predetermined time slot in a well defined time frame. As is well known in TDM telephone systems for telephone conversations all information is being transmitted in parallel over a common trunk by allocating to each connection one specific time slot, the maximum number of concurrent conversation connections possible equalling the number of time slots available for that purpose per time frame.
5. The characterising part of Claim 1 although its wording is not very clear is construed to mean that the distribution arrangement (100) is a time division switching network. This time division switching network is part of a stored program time division multiplex private branch telephone exchange. The time division switching network provides a plurality of time slots for connections through the network to each of the recited telephone lines, by which the normal telephone traffic is being processed.

So far the characterising part of Claim 1 presents the usual features of a TDM PABX, which also according to this characterising part are combined to a control system

according to the prior art part of Claim 1 (and known from US-A-4 021 615) by choosing the time division switching network as the distribution arrangement (100) for the audio frequency control signal.

What remains in the characterising part is the further feature which was particularly emphasized by the Appellant during oral proceedings that the time division switching network (in its quality of distribution arrangement (100) for the audio frequency control signal) provides connections through the network to each of (i.e. to all) the recited telephone lines during one particular time slot.

It is clear that when the said plurality of time slots mentioned earlier are the time slots by which the normal telephone traffic is being processed, then the said one particular time slot is not one of these.

It goes without saying that whether the one particular time slot carries an audio frequency control signal or not, the normal telephone traffic is still being processed (via the other time slots) i.e. if the one particular time slot is a time slot defined as having a fixed position within the time frame. Time slots may even be swapped. As long as signals in different time slots do not interfere with each other, and as this is the very principle on which TDM is based, normal telephone traffic can always take place without interference from the said one particular time slot and therefore undisturbed by the audio frequency control signal. The Board of Appeal is of the opinion that what has been said here about TDM goes not beyond common knowledge.

Therefore the Board considers firstly the combination as such of an energy control system as known from US-A-4 021 615 and

a TDM telephone system as obvious. Secondly, it also considers the way in which this combination is put into effect in accordance with Claim 1 as obvious.

Consequently the subject-matter of Claim 1 is considered not to result from an inventive step and is not patentable because of Article 52 and 56 EPC.

6. As already mentioned, the summary given of the characterising part of Claim 2 under item VII (ii) of the Summary of Facts and Submissions of this decision, was agreed to by the Appellant. The Board notes that all the features of this summary are known in combination from the cited US-A-4 021 615. Claim 2, in its entirety comprises the contents of Claim 1 to which it refers plus the contents of its own characterising part.

Claim 2, therefore comprises the prior art part of Claim 1, the characterising part of Claim 1 and the characterising part of Claim 2.

After the foregoing it is clear that the prior art part of Claim 1 in combination with the characterising part of Claim 2 are known from one single document, the cited US-A-4 021 615.

Therefore, what Claim 2 only adds to the prior art according to this document is the characterising part of Claim 1.

The application of the features of the characterising part of Claim 1 to the known combination of the prior art part of Claim 1 and the characterising part of Claim 2 is not found to imply an inventive step on the same grounds as on which Claim 1 was considered obvious.

Therefore also Claim 2 is considered to comprise no patentable subject-matter (Articles 52, 56 EPC).

One may even note here that apparently the integration of the energy control system and the TDM telephone system according to the present application is not yet so far advanced as one might have expected.

It seems surprising e.g. that the system of the application still uses a hook status detector at the subscriber's site, so that coincidence detection of telephone on hook and presence ~~of~~ the audio frequency control signal is carried out at the subscriber's site. This means that the audio frequency control signal is applied to the subscriber line, even when the telephone is off-hook, e.g. when the subscriber is engaged in a telephone conversation.

One might expect that in a fully electronic exchange the off-hook condition is already being detected in the exchange and that then no audio frequency control signal will be sent on the off-hook telephone line.

7. The conclusion arrived at in the foregoing, i.e. the non-patentability of Claims 1 and 2 because of lack of inventive step, needs in the view of the Board of Appeal no revision in the light of the further comments the Appellant has made in the course of the procedure, in particular in his Statement of Grounds and during oral proceedings before the Board, as will be illustrated in the following:

- (i) In the Statement of Grounds the Appellant mentions the fact that according to US-A-4 021 615 a continuous 50 m sec tone has to be applied to the detection

apparatus to function properly and this is said to be an indication that the detection apparatus used according to this citation is a relatively slow-acting device.

The detecting device of the application is said to be faster. This may indeed be the case, but even if so, this fact is not being exploited in the present application, which uses a first time interval of 2 full seconds, the first time interval in the citation being only 45 m sec.

Of course neither the 45 m sec detection time of the citation nor the 2 sec detection time of the application would be satisfactory if the telephone switching were a space division switch, in which the audio frequency control signal were to be transmitted in the same way as normal telephone traffic, since there would be a significant increase in the total traffic causing increased blocking of the switching system, as has been remarked in the Statement of Grounds.

It is however to be noticed that this blocking would still be worse with the 2 seconds detection time of the application than with the 45 m sec detection time of the citation.

In fact the Appellant has given here the justification for the embodiment of the control system of the citation, in that the control system is to be superimposed upon instead of being integrated in the telephone system as long as the telephone system has not been specified.

The Board of Appeal agrees to the remark in the Statement of Grounds according to which exactly the same situation of increased blocking applies if a time division network is provided in the telephone switching system in which the audio frequency control signal is transmitted by normal speech connections. Also here the 2 sec detection time of the application would make the blocking effect still worse than the 45 m sec detection time of the citation.

In summing up it must be remarked that the detection effectively used according to the application (detection time 2 seconds) is appreciably slower than that of the citation (detection time 45 m sec), contrary to what the Appellant has stated in the Statement of Grounds.

So the present invention offers no advantage in this respect with regard to the prior art.

Moreover, as will be shown in the next paragraph (ii), the duration of the detection time in a TDM system such as according to the application seems to be less critical, so that a shorter detection time than that of the cited US patent would not offer an advantage of the degree suggested by the Appellant, if the detecting time of the application were indeed shorter than that of the citation, which happens not to be the case.

- (ii) It is obvious that the blocking effects mentioned can be prevented by choosing a separate channel, which does not suffer from interference from other channels for the audio frequency control signal, as e.g. a predetermined time slot in a TDM system.

Gibbs offers evidence that in the TDM PABX, the tone signalling is by way of one or more time slots. As mentioned earlier the Appellant remarked during the oral proceedings that in the system of Gibbs as many as eight time slots for tone signalling are being used, while the application reserves only one single time slot for the audio frequency control signal. In view of the limited duration of a time frame (125 μ sec standard duration being used in the system of the application according to the Appellant) and the limited number of time slots per time frame it is considered as obvious to the skilled person to limit the number of time slots reserved for special tasks to an absolute minimum: every time slot used for such tasks will decrease the number of time slots available for speech connections and the accompanying indispensable signalling. Therefore the provision of a single time slot for the audio frequency control signal is entirely obvious and the skilled person must be expected to adapt his system in that sense as far as possible under the circumstances. Besides the fact that Gibbs uses more than one time slot for tone signals is at least partly explained by his apparent use of tone signals of different kinds as implied by page 49, left column, fourth paragraph where it says that cadencing of tones is also provided for, that each tone (among different tones with different character!) appears at a fixed time slot and that the CPU has to take care to connect a given port to a particular tone (among different tones with differing character!).

So neither the allegedly smaller detection time according to the application with regard to the US patent discussed under (i) nor the use of one single time slot according to the

application with regard to Gibbs as discussed under (ii) can contribute to inventive step as concerns the present invention.

The effectively used detection time for the audio frequency signal turned out to be even smaller in the US-patent device than in the application. Once this audio frequency signal has been allotted to one or more time slots in a TDM system, the difference in detection time of course becomes less important because the audio frequency signal can no longer interfere with other signals, since these signals occur in other time slots.

After the foregoing the Board sees no grounds for changing its opinion as to the unpatentability of Claims 1 and 2 because of lack of inventive step, as pronounced earlier.

For these reasons,

it is decided that

the appeal is dismissed.

The Registrar

The Chairman

B A Norman

G Korsakoff