UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JUKKA VIALEN, JAAKKO RAJANIEMI,
and SERGE HAUMONT

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Appeal 2008-3462
Application 09/790,469
Technology Center 2600

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Decided: August 26, 2008

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Before JOHN C. MARTIN, LEE E. BARRETT, and MARC S. HOFF, *Administrative Patent Judges.*

MARTIN*, Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-7 and 17-20 under 35 U.S.C. § 102(e). Claims 8-16 stand allowed.

We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

A. Appellants' invention

Appellants' invention concerns generally the technology of re-establishing a lost radio connection between a mobile terminal and a base station in a cellular radio system and is more particularly directed to optimizing the re-establishment procedure so that it takes into account the real time or non-real time nature of the services provided through the radio bearers (Specification 1:8-12).

Appellants' "Background of the Invention" (Background) notes that the specifications of many second generation and most third generation cellular radio systems give support for establishing real time (RT) and non-real time (NRT) services between mobile terminals and base stations (*id*. at 2:15-17). RT services are used for time-critical applications like speech and real time video, while NRT applications usually convey data like e-mails or downloaded files (*id*. at 2:17-19).

The Background further explains that in cellular radio systems it often happens that a radio connection between a user terminal and a serving base station is temporarily lost due to interference or unfavorable signal propagation conditions and that in most cellular radio systems there have been arrangements for re-establishing lost connections rapidly so that the incident might pass unnoticed to the user or at least the inconvenience caused will be as small as possible (*id*. at 2:24-29). As an example, the

Background discusses the re-establishment procedures defined for RRC (Radio Resource Control) connections in the 3GPP (Third Generation Partnership Project) specification numbers TS25.331, TS25.302, TS25.321 and TS25.322, which are published by the ETSI (European Telecommunications Standard Institute) (*id*. at 2:29 to 3:3). Specifically, after detecting the loss of a radio connection the mobile terminal starts a timer referred to as timer T314, or the "re-establishment" timer (*id*. at 3:12-15). If the mobile terminal finds itself to be within an "in service area," where connection re-establishment is possible, it stops the timer T314 and transmits a message known as the RRC CONNECTION RE_ESTABLISHMENT REQUEST on the uplink CCCH or Common Control CHannel (*id*. at 3:15-19). However, if the timer T314 expires before the mobile terminal finds itself to be within an "in service area," the mobile terminal must enter an RRC-idle mode where active communication with base stations is not possible (*id*. at 3:19-22). The value of the timer T314 may be anything between 0 and 4095 seconds (*id*. at 3:24).

Appellants note that the problem with the foregoing prior art procedure is its inflexibility regarding different types of services, e.g., real time (RT) versus non-real time (NRT) services (*id*. at 4:4-5). Due to its nature, an RT connection does not tolerate long delays or breaks, so a relatively small value, on the order of seconds, should be selected for the expiration of the timer T314 (or other timer used for a similar purpose) (*id*. at 4:5-8). On the other hand, NRT connections are much more tolerant and

can withstand temporary delays in the order of minutes or even tens of minutes (*id*. at 4:11-13).

Appellants' solution is to assign different timer expiration periods to different categories of service, such as RT and NRT connections.

Appellants' Figure 1 is reproduced below.

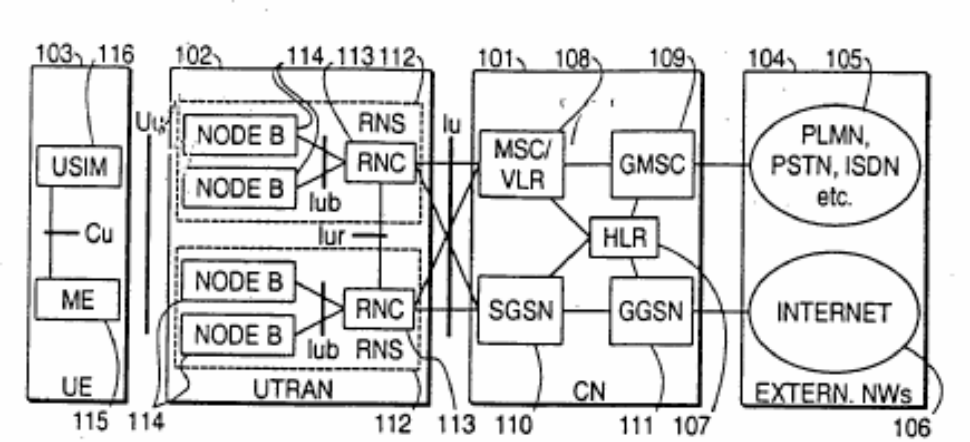

Fig. 1
PRIOR ART

Figure 1 illustrates a known network architecture (*id*. at 9:27). The main parts of a mobile telephone system having this architecture are a CN (Core Network) 101, a UTRAN (UMTS[1] Terrestrial Radio Access Network) 102, and a UE (user equipment) 103 (*id*. at 10:21-23). UTRAN 102 is composed of RNSs (Radio Network Subsystems) 112, each of which

[1] UMTS refers to Universal Mobile Telecommunications System (*id*. at 1:28-29).

comprises a RNC (Radio Network Controller[2]) 113 and one or more Node Bs 114 (*id*. at 11:9-11).

Appellants' Figure 2a is reproduced below.

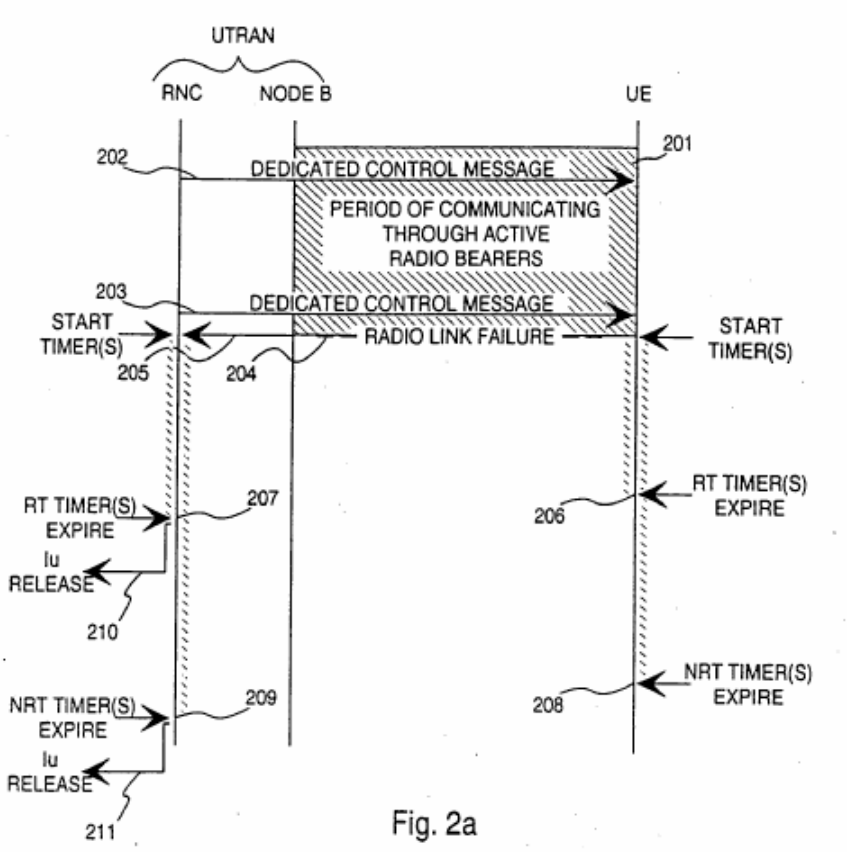

Fig. 2a

Figure 2a illustrates a communication situation employing an embodiment of the invention (*id*. at 9:29-30).

In Figure 2a, time runs from top to bottom (*id*. at 13:7-8). Throughout a period 201 (shown cross-hatched), the UE (user equipment) has been communicating with the UTRAN through a set of radio bearers belonging to

[2] *See id*. at 3:25.

an RRC connection (*id*. at 13:8-10). At a certain time instant 204 there is a radio link failure that cuts the radio connection between the UE and the UTRAN (*id*. at 13:16-17). When the UE detects that the radio connection has been lost, it starts at least one timer (*id*. at 13:17-18). Likewise, when the UTRAN detects that the radio connection has been lost, it starts at least one timer (*id*. at 13:18-20). In the Figure 2a embodiment, the UE and the UTRAN each start at least two timers, one of which concerns the re-establishment of the radio connection in respect of the RT-related radio bearers and the other of which concerns the re-establishment of the radio connection in respect of the NRT-related radio bearers (*id*. at 13:27 to 14:1). The RT and NRT timers in the UE successively expire at times 206 and 208, respectively, and the RT and NRT timers in the UTRAN successively expire at times 207 and 209, respectively (*id*. at 14:3-9 and 25-28). Expiration of either timer in the UTRAN results in issuing a release message that initiates a release procedure for the corresponding RT or NRT service, as indicated by messages "Iu RELEASE" in Figure 2a (*id*. at 14:28 to 15:3).

B. The claims

Claims 1 and 17, the only independent claims on appeal, read as follows:

> 1. A method for determining the expiry time for a period during which the re-establishment of a lost radio connection including at least one radio bearer, is allowable, comprising the steps of:
>
> - determining a first expiry time for a period during which the re-establishment of the lost radio connection in

respect of radio bearers used to provide a service or services of a first category is allowable and

- determining a second expiry time for a period during which the re-establishment of the lost radio connection in respect of radio bearers used to provide a service or services of a second category is allowable.

17. A communications device of a cellular radio system, comprising:

- means for detecting a failure in a radio connection including active radio bearers,

- means for determining a first expiry time for a period during which the re-establishment of the lost radio connection in respect of radio bearers used to provide a service or services of a first category is allowable and

-means for determining a second expiry time for a period during which the re-establishment of the lost radio connection in respect of radio bearers used to provide a service or services of a second category is allowable.

Br., Claims App.

C. The reference and rejection

The Examiner relies on the following reference:

Virtanen	US 6,249,681 B1	June 19, 2001

Claims 1-7 and 17-20 stand rejected under 35 U.S.C. § 102(e) for anticipation by Virtanen.

THE ISSUE

The issue is whether Appellants have shown reversible error by the Examiner in maintaining the rejection. In an appeal from a rejection for anticipation, the Appellants must explain which limitations are not found in the reference. *See Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997) ("[W]e expect that the Board's anticipation analysis be conducted on a limitation by limitation basis, with specific fact findings for each *contested* limitation and satisfactory explanations for such findings.") (emphasis added). *See also In re Kahn*, 441 F.3d 977, 985-86, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

ANALYSIS

A. Principles of law

Anticipation is a question of fact. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). "To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently."

B. The merits of the rejection

Virtanen discloses a method and apparatus for re-establishing an interrupted packet data call in a telecommunications system (Virtanen, col. 1, ll. 6-9).

Figure 1 of Virtanen is reproduced below.

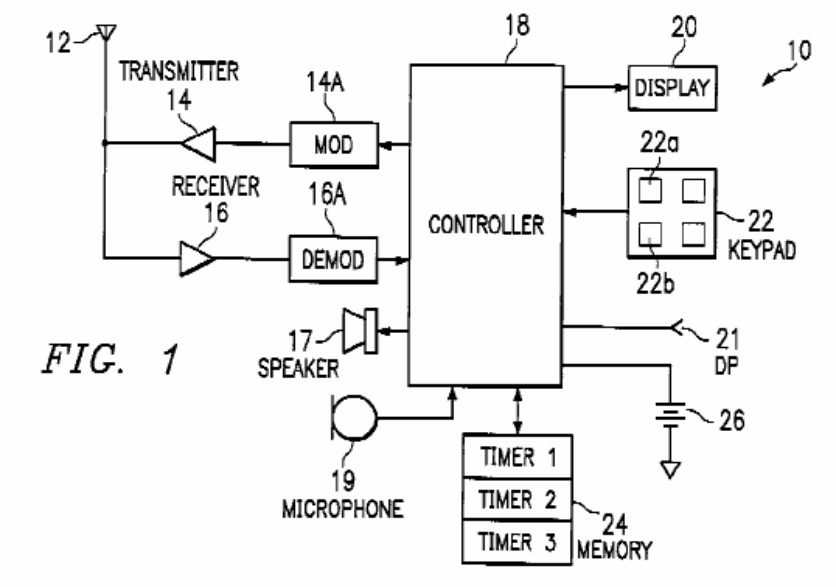

FIG. 1

Figure 1 is a block diagram illustrating a mobile telephone constructed according to an embodiment of Virtanen's invention (*id*., col. 5, ll. 22-24).

Mobile station 10 as depicted in Figure 1 includes a memory 24 that maintains software which functions as timers 1-3 (*id*., col. 8, ll. 56-58; col. 10, ll. 26-28).

As explained below, timers 1 and 2 are packet data inactivity timers. The operation of these timers is depicted in Figures 3A-3C, of which Figure

3A is reproduced below.

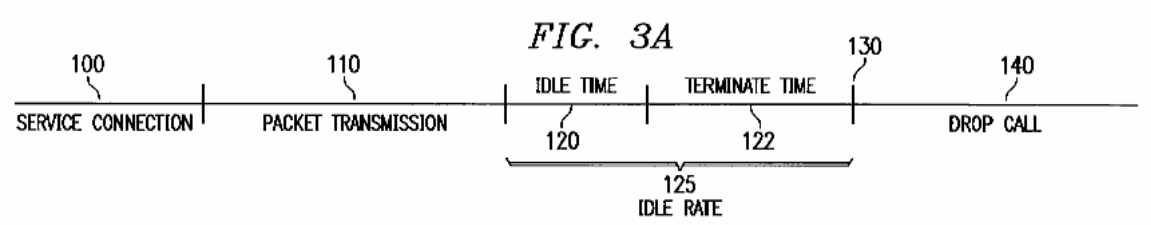

Figure 3A is a diagram illustrating a packet data inactivity timer function (*id*., col. 8, ll. 21-22).

This diagram illustrates the data packet inactivity timer functions in each of a mobile station and a base station (*id*., at ll. 21-22). Referring to this diagram, Virtanen explains that

> [a]fter a packet data service is connected during time period **100**, data packets are transmitted at the Peak Rate during time period **110**. When no packets are transmitted the rate switches automatically to the Idle Rate during time period **125**. Time period **125** includes idle time period **120** and terminate time period **122**. The packet data service remains at idle rate until idle time period **120** expires. If packet transmission does not resume before the [t]erminate time period **122** expires at time **130**, packet service is disconnected at time **130**. During time period **140** the call has been released.

Id., col. 8, ll. 22-32. Idle time period 120 and terminate time period 122 are measured by timers 1 and 2, respectively (*id*., col. 8, ll. 54-58).

Figures 3B and 3C, not reproduced below, illustrate that termination will be avoided if data packet transmission is re-initiated prior to the end of terminate time period 122. As shown in Figure 3B, data transmission that is re-initiated during idle time period 120 will be performed at the peak rate

(*id*., col. 8, ll. 34-41), which is the maximum data rate (*id*., col. 7, Table II). As shown in Figure 3C, data transmission that is re-initiated during terminate time period 122 will initially be performed at an intermediate rate (see Table II) until an acknowledgement (ACK) is received (at time 340), after which transmission will continue at the peak rate (*id*., col. 8, ll. 42-48).

The Examiner reads the recited first and second expiry times on time periods 120 and 122 (Answer 3), which together form time period 125, and reads the recited first and second categories of service on the peak transmission rate and the intermediate transmission rate, respectively (*id*. at 9). We agree with Appellants that the Examiner's position is unsound. As Appellants correctly point out (Br. 6), time periods 120 and 122 do not occur after a connection has been lost, as required by the claims, which call for determining first and second periods during which re-establishment of a lost radio connection is possible. Instead, loss of a connection in the diagram of Figure 3A does not occur until time 130, at the end of terminate time period time 122. Only then is the packet service "disconnected" or "released" (Virtanen, col. 8, ll. 31-32), thereby raising the possibility of re-establishing the lost connection. Appellants are therefore correct to state that "[t]he re-establishment process of Virtanen begins after the expiration of time period 125 (see column 9, lines 4-7)" (Reply Br. 3).

The Examiner additionally relies on Virtanen's disclosed procedure for re-establishing a connection between the mobile station and the base station after a connection has been released (i.e., lost) (Answer 8-9). This

procedure, which the Examiner notes (*id*.) is summarized Virtanen's Background and "Summary of the Invention" and is the subject of Virtanen's claim 15, is depicted in Virtanen's Figure 4, reproduced below.

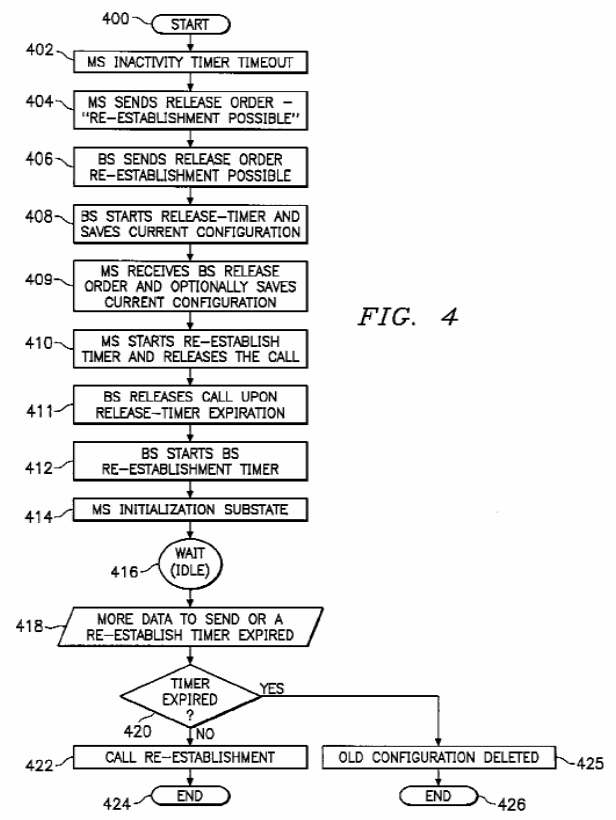

FIG. 4

Figure 4 is a flow diagram illustrating the process steps performed during the call release and re-establishment process in the cellular system of Virtanen's Figure 1 (Virtanen, col. 8, ll. 64-67).

The process begins at step 402, when the inactivity timer expires in mobile station (MS) 10 (*id*., col. 9, ll. 4-5). Upon expiration of the inactivity timer, a release order message is formatted within MS 10 (*id*., col. 5, ll. 5-6).

The release order message is a modified IS-95[3] release order that functions to indicate to network 32 that call re-establishment is possible with this call release (*id*., col. 9 ll. 6-9). After the performance of steps 404, 406, 408, and 409, the details of which are unimportant to this discussion, MS 10 in step 410 releases the call at the MS side and starts the MS re-establish timer, which may be implemented in memory 24 of MS 10 as timer 3 (*id*., col. 10, ll. 23-28). In steps 411 and 412, base station (BS) 30 releases the call upon the expiration of the release timer started at step 408 and starts the BS re-establish timer (*id*., col. 10, ll. 33-35).

MS 10 remains in the idle state of step 416 until the re-establish timer in either MS 10 or MSC 34 expires or until either MS 10 or MSC 34 has more data to send that belongs to the released packet call (*id*., col. 10, ll. 48-51). Either of these events is received as a process input at step 418 and causes the process to move to step 420 (*id*., col. 10, ll. 51-53). At step 420 it is determined if the re-establish timer in either the MS 10 or the MSC 34 has expired (*id*., col. 10, ll. 53-55). If either re-establish timer has expired, the process moves to step 425, wherein the old configuration[4] is deleted from the memory of the device in which the timer expired, after which the process ends (step 426) (*id*., col. 10, ll. 55-59). If, however, no re-establish timer has

[3] IS-95 is described at page 1, lines 22-26 of Appellants' Specification as a radio access network interim standard.

[4] A configuration consists of saved information that is relied on to re-establish a connection (*id*., col. 10, ll. 14-18).

expired, the process moves to step 422, wherein the call is re-established according to the process shown in either of Figures 5A and 5B (*id*., col. 10, ll. 59-62).

The re-establishment procedure represented as step 422 in Figure 4 is depicted in Figures 5A and 5B, of which Figure 5A is reproduced below.

FIG. 5A

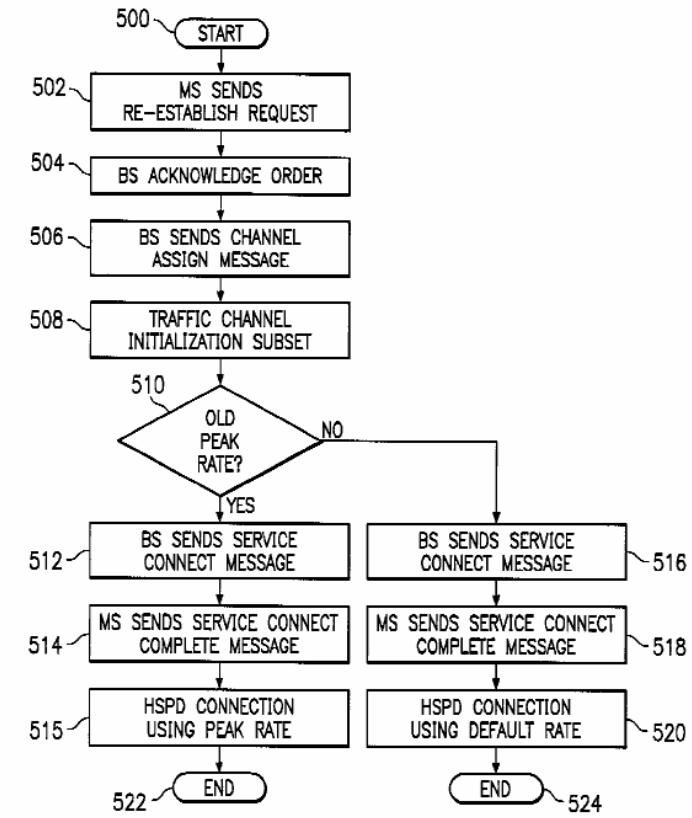

Figure 5A is a flow diagram illustrating process steps performed during call re-establishment initiated by mobile station MS (*id*., col. 5, ll. 36-38). Figure 5B, which is not reproduced below, illustrates a similar process

performed during call re-establishment initiated by base station BS (*id*., col. 13, ll. 9-11).

In step 510 of the Figure 5A process, a determination is made as to whether or not the previous (old) peak rate is to be used (*id*., col. 14, ll. 32-34). If the MSC (mobile switching center[5]) 34 determines that the system can support the previous peak rate, the process moves to step 522, wherein the HSPD (high speed packet data[6]) connection between MS 10 and BS 30 using the old peak rate is re-established, after which the re-establishment process ends in step 522 (*id*., col. 14, ll. 34-44). If, however, MS 34 determines at step 510 that the previous peak rate is not to be used, the process moves to step 524 and an HSPD connection between MS 10 and BS 30 using a default rate is established, after which the call re-establishment process ends at step 524 (*id*., col. 14, ll. 45-54). Thus, the choice of whether to use the peak rate or the default rate does not depend on two different timers measuring two different expiration times.

Therefore, even assuming for the sake of argument that the peak rate and defaults rate constitute different categories of service in the sense of the claims, Appellants are correct to point out that Virtanen's re-establishment procedure does not use respective first and second expiry times for those two categories of service (Reply Br. 2).

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[5] *See id*., col. 4, l. 11-12.

DECISION

The rejection of claims 1-7 and 17-20 under 35 U.S.C. § 102(e) for anticipation by Virtanen is reversed.

The Examiner's decision that claims 1-7 and 17-20 are unpatentable for anticipation by Virtanen is reversed.

REVERSED

rvb

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[6] *See id*., col. 2, ll. 33-34.