PATENTTI- JA REKISTERIHALLITUS
NATIONAL BOARD OF PATENTS AND REGISTRATION

Helsinki 13.10.2000

PCT/FI00/00737

#6

RECD 31 OCT 2000
WIPO PCT

ETUOIKEUSTODISTUS
PRIORITY DOCUMENT

Hakija Applicant	**Nokia Oyj** **Espoo**
Patenttihakemus nro Patent application no	**19991865**
Tekemispäivä Filing date	**01.09.1999**
Kansainvälinen luokka International class	**H04M**

Keksinnön nimitys
Title of invention

"Method and arrangement for providing customized audio characteristics to cellular terminals"
(Menetelmä ja järjestelmä räätälöityjen audio-ominaisuuksien toimittamiseksi solukkojärjestelmien päätelaitteisiin)

Täten todistetaan, että oheiset asiakirjat ovat tarkkoja jäljennöksiä patentti- ja rekisterihallitukselle alkuaan annetuista selityksestä, patenttivaatimuksista, tiivistelmästä ja piirustuksista.

This is to certify that the annexed documents are true copies of the description, claims, abstract and drawings originally filed with the Finnish Patent Office.

Marketta Tehikoski
Apulaistarkastaja

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Maksu 300,- mk
Fee 300,- FIM

Osoite: Arkadiankatu 6 A
P.O.Box 1160
FIN-00101 Helsinki, FINLAND
Puhelin: 09 6939 500
Telephone: + 358 9 6939 500
Telefax: 09 6939 5328
Telefax: + 358 9 6939 5328

requires the user to send an SMS message (Short Messaging Services) to a certain ringing tone server coupled to the fixed parts of the cellular network, said message indicating the user's willingness to download a new ringing tone and preferably also identifying a particular melody which the user is interested in. The server responds with a specifically formatted SMS message that contains machine-readable instructions which the portable terminal can use to reproduce the ringing tone in question.

Although the selectability and downloading services described above has concentrated on ringing tones, it would be possible to use similar methods and arrangements to select personal tones or melodies for all occasions when the portable terminal emits an indicatory audio signal. Such occasions comprise but are not limited to indicator tones for key depressing, alarm sounds for battery depletion and other threatening events as well as amusing sounds for games.

The drawbacks of the prior art arrangements for providing selectability to portable terminals' audio characteristics are related to the limited sound reproduction capability on one hand and to the shortage of various resources on the other. With resources we mean the memory space and allocatable processing capability of the portable terminal itself as well as the allocatable transmission resources between the terminal and the fixed parts of the cellular radio network. We will illustrate the resource question with some examples.

At the priority date of this patent application one of the most popular ways of distributing arbitrary high quality audio sequences in electronic form is MP3 or MPEG-2 Layer 3 coded audio, where MPEG originally comes from Motion Picture Experts Group. The MP3 audio encoding is based on a method where an original audio sequence is recorded, digitized and compressed by performing a number of mathematical transformations on short consecutive frames of the digitized signal. One minute of MP3 encoded audio signal results in approximately 8 Mbits of data depending on the used compression rate. If we set the minimum temporal length of a ringing tone at ten seconds, a single melody would require over 1.3 Mbits of memory when stored. This is far too much regarding the limited amount of memory allocatable to ringing tones in known portable terminals. The downloading of such a ten-second audio sequence over the known GSM (Global System for Mobile telecommunications) digital cellular network at 9.6 kbit/s would take well over two minutes, which is unacceptable in terms of network loading and communication

cost. Decoding an MP3 encoded bitstream into a for suitable for playback requires quite intensive processing.

At the priority date of this patent application there is one portable terminal on the market, known by the registered trademark "Nokia 9110 Communicator" of Nokia Corporation, that supports the playback of arbitrary audio tones encoded by Pulse Code Modulation or PCM. A typical 8-bit PCM encoded wave file that represents ten seconds of emitted signal with relatively low audio quality has the size of 640 kbits. Although this is considerably less than what is required by the MP3 encoded sequence, it is still too much for large-scale downloading.

It is an object of the present invention to provide a method and an arrangement for offering a wide variety of selectable audio characteristics to the users of terminal equipment with reasonable requirements concerning memory space, processing capability and transmission resources. It is a further object of the invention to provide compatibility of the method and arrangement with a large selection of terminal types and operating software. An additional object of the invention is to make it easy for the user to tailor the audio characteristics of terminal equipment according to personal taste.

The objects of the invention are achieved by presenting audio sequences in a form with a score information part and an instrument information part. The instrument information part contains synthesis parameters that define the timbre, or the synthesized sound or sequence of sounds. The score information part contains instructions that define the usage of the instrument information. Additionally there is provided compatibility information describing the compatibility of such audio sequences with known terminal capabilities.

The method according to the first embodiment of the invention is characterized in that it comprises the steps of

- providing a score information part describing the presentation instructions of an audible signal,
- providing an instrument information part describing the parameters for synthesizing an audible signal the presentation instructions of which is described by said score information part,
- providing compatibility information describing the compatibility of said score information part and said instrument information part with certain processing and storing capacity and

- as a response to a selection command, downloading said score information part and said instrument information part to terminal equipment through a communication network.

The method according to the second embodiment of the invention is characterized in that it comprises the steps of
- indicating the type of terminal equipment to a network,
- receiving from the network information concerning available score information parts, each of them describing the presentation instructions of an audible signal, and instrument information parts, each of them describing the parameters for synthesizing an audible signal the presentation instructions of which is described by a score information part,
- indicating at least one score information part and at least one instrument information part from said available score information parts and instrument information parts as selected, and
- receiving the score information part and the instrument information part indicated as selected from the network.

The invention also applies to an apparatus which comprises a network device. It is characterized in that the network device comprises
- a database of score information parts, each score information part describing the presentation instructions of an audible signal,
- a database of instrument information parts, each instrument information part describing the parameters for synthesizing an audible signal the presentation instructions of which is described by a score information part,
- compatibility information associated with said score information parts and instrument information parts, describing the compatibility of said score information parts and said instrument information parts with certain processing and storing capacity and
- means for responding to a selection command by downloading a score information part and a instrument information part to terminal equipment through a communication network.

According to the invention a service provider or a similarly acting other body maintains a database that comprises a plurality of sound packets. A sound packet is understood in this context as an entity that comprises a piece of musical score information and a set of parameters that relate to the "instruments" or synthesized sound sources which should be used to play the score. A sound packet is preferably

self-contained in the sense that once it has been loaded into terminal equipment with appropriate processing and audio outputting capabilities, it enables the terminal to output a certain passage of audio signal where the synthesized sounds described by the parameters perform the presentation written into the score information. Said database contains also information about the compatibility of the stored sound packets with the capabilities of known terminal types. For downloading into a certain terminal equipment of known type only those sound packets are made available that do not exceed the terminal's capabilities.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended Claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

Fig. 1 illustrates the structure of a sound packet according to an advantageous embodiment of the invention,

Fig. 2a illustrates an advantageous database arrangement,

Fig. 2b illustrates another advantageous database arrangement,

Fig. 3 illustrates an alternative database arrangement,

Fig. 4 is a flow diagram of a method according to the invention,

Fig. 5a illustrates a software tool for applying the invention,

Fig. 5b illustrates further software tools for applying the invention,

Fig. 6 illustrates some communication connections that can be used for applying the invention,

Fig. 7 illustrates some pieces of hardware in a terminal according to the invention and

Fig. 8 illustrates a broadcasting-based embodiment of the invention.

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.