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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04M 3/42	A1	(11) International Publication Number: WO 99/14924
		(43) International Publication Date: 25 March 1999 (25.03.99)

(21) International Application Number: PCT/US98/18646

(22) International Filing Date: 8 September 1998 (08.09.98)

(30) Priority Data:
08/928,264   12 September 1997 (12.09.97)   US

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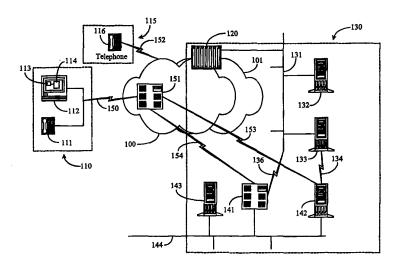(74) Agent: BOYS, Donald, R.; P.O. Box 187, Aromas, CA 95004 (US).

(81) Designated States: AU, CA, CN, JP, KP, RU, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: INTERNET CALL WAITING

(57) Abstract

A telephony call–waiting system for clients having a computer (112) with a video display unit (PC/VDU) and a public–switched telephony network (PSTN) telephone (111) connected to the PSTN (151) by a single line (150), keeps a status indication of the client's Internet connection status and, during periods of time the PC/VDU is connected to the Internet (101), alerts the clients by an alert signal over the Internet connection of any waiting PSTN calls. In a preferred embodiment the client's PC/VDU is adapted to provide an audio and/or visual alert event when an alert signal is received, and to provide for a user–initiated response to an alert, accepting or rejecting a call. In the event a call is accepted, provision is made for connecting the accepted call to the client's PC/VDU as an IP call. In some embodiments several calls may be dealt with at the PC/VDU, and features are provided such as caller–ID on the client's VDU. Several ways of accomplishing the call–waiting system are taught.

Internet Call Waiting

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Field of the Invention

The present invention is in the field of Internet communication and pertains
more particularly to apparatus and methods for providing call waiting services for
10   what are known as Internet Phone (IP) calls.

Background of the Invention

15   The present invention deals with telephony systems, including conventional
telephone calls delivered to a telephone, and what are known now in the art as Internet
Phone (IP) calls, which are telephone calls delivered over the Internet, and to which a
user interfaces with a computer station, such as a personal computer (PC) during a
session wherein the user is connected to the Internet. To avoid confusion a
20   convention is adopted for the purposes of this specification wherein the conventional
telephone calls delivered over the public-switched telephony network to a telephone
will be called PSTN calls, and the IP calls will continue to be called IP calls.

The Internet is a global matrix of linked computers and file servers providing a
virtually unlimited pool of knowledge to any user who has a connection for access.
25   The state of the Internet is continually evolving and changing both in scope and
technology. What has evolved from a type of military infrastructure has become a
largely civilian super-structure allowing exchange of information to take place rapidly
from almost any location in the world.

At the time of the present patent application, Internet infrastructures are largely land-based, transmitting data over digital links and analog lines, and the like. The typical user connections for the land-based infrastructure include a telephone line, a modem, and an Internet Service Provider (ISP) through which connection to the
5   Internet is provided. Generally speaking, these connective elements are all that are required for a user to have the basic capability to access the Internet, provided the user has a PC with at least minimum system requirements.

At the time of the present patent application, it is believed by the inventor that between 60% and 80 % of persons having Internet access have only one telephone
10   line to their premises, and the one line is connected to their personal computer and is also the user's regular telephone for receiving PSTN calls. It is well known in the art that a telephone line that is connected to a computer station and receiving digital data from the Internet cannot, at the same time, receive a PSTN call.. Therefore, if a person were to call someone who happens to be in a current session on the Internet
15   and using that particular line, the person placing the call would receive a busy signal. Because of this, if the person browsing the Internet has call-waiting service, the call waiting feature has to be disabled while browsing the Internet, because a call-waiting signal would disrupt an Internet data transfer.

A typical telephone connection dedicated to accessing the Internet can be
20   expensive to maintain for a typical family that also maintains a telephone connection for conventional PSTN call use. Many families simply cannot afford to maintain more than one telephone line as would be required to browse the Internet and also receive PSTN calls in a normal fashion. Being restricted to one telephone line that is used for both Internet access and PSTN calls can be more than just an inconvenience
25   for a family, especially for a family with children. For example, while a user with a single phone line is browsing the Internet, one of the user's children may be trying to phone home. There is no way the user can receive even emergency calls.

Personal Computers (PCs) on the market today are typically capable of multimedia communication. For example, with the appropriate software, speakers, a

standard microphone, and a sound card, a typical PC can be used as a voice communication device much like a telephone. Thus equipped, a caller can engage in two-way, real-time communication with one or more people while connected to the Internet. Since the Internet is the communication medium for such applications, there are no toll charges involved for long distance connections. While not accruing toll charges is a distinct advantage with this type of arrangement, a drawback is that persons called or calling an Internet-connected user must have a multimedia PC connected to the Internet and have the matching software installed.

What is clearly needed is a system including software executable on a multimedia PC whereby a person connected to the Internet and having only one telephone line can continue to receive PSTN calls from a user and make PSTN telephone calls to persons not connected to the Internet while he or she is engaged in an on-line browsing session. Such a system would alleviate inconvenience and concern associated with the inability to receive possibly important telephone calls while on-line. Such a method could also alleviate the expense associated with the addition of a second telephone line.

Summary of the Invention

In a preferred embodiment of the present invention an Internet call-waiting telephony system is provided, comprising a telephony link adapted to connect a client's computer station and the client's public-switched telephony network (PSTN) telephone to a local PSTN switch; a port at the local PSTN switch adapted to receive PSTN calls directed to the client; a status indicator indicating the client's Internet connection status; and an IP interface adapted to convert a PSTN telephone call to an Internet telephone protocol, the IP interface connected to both the PSTN and the Internet. During time that the status indicator indicates the client is Internet-

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