Abstract: A telephone answering system having a phone silence actuator (280) for silencing a telephone ringer. The phone silence actuator, in response to an incoming call, may silence the telephone ringer or it may activate a telephone answering machine to answer the phone. The phone silence actuator has a user input that may be activated by a user in response to the incoming call. The user input may be at least one of a push-button input and a voice input. The voice input may detect any user voice input or it may discriminate between different user commands to produce one of the desired responses.
Phone silence system

This invention generally relates to a method and device to simplify home telephone usage. Specifically, the present invention pertains to a system for quieting a telephone in accordance with a user's request.

In prior art telephones, there are systems that may be enabled to answer telephones such as telephone answering machines. These answering machines may be set up in advance to answer a telephone when a user is unavailable. This may be a time when a user is away from the house or when a user is just too busy to answer a telephone. However, these systems must be set up in advance. Therefore, in the prior art systems, a user must anticipate whether or not they wish to answer a telephone before the time that the phone starts ringing.

In addition, even after a user has anticipated that they do not want to answer the telephone or can not, the phone is still heard to ring a given number of times before the answering machine will answer the phone. In this way, a user that does not wish to be disturbed, for example, is still disturbed until the answering machine answers the phone, and thereby, stops the ring of an incoming call.

Accordingly, it is an object of the present invention to overcome the disadvantages of the prior art.

It is a further object of the present invention to provide a method and a data processing device wherein an unauthorized modification or supplementation of instructions may be recognized.

A telephone answering system in accordance with an embodiment of the present invention may have a phone silence actuator for silencing a telephone ringer. The phone silence actuator, in response to an incoming call, may silence the telephone ringer or it may activate a telephone answering machine to answer the phone. The phone silence actuator has a user input that may be activated by a user in response to the incoming call. The user input may be at least one of a push-button input and a voice input. The voice input
may detect any user voice input or it may discriminate between different user commands to produce one of the desired responses.

The following are descriptions of embodiments of the present invention that when taken in conjunction with the following drawings will demonstrate the above noted features and advantages, as well as further ones. It should be expressly understood that the drawings are included for illustrative purposes and do not represent the scope of the present invention. The invention is best understood in conjunction with the accompanying drawing in which:

FIGs. 1, 2, and 3 show block diagrams of phone silence telephone systems in accordance with embodiments of the present invention; and

Fig. 4 is a flow diagram illustrating operation of the phone silence systems shown in FIGs. 1, 2, and 3.

In the discussion to follow, certain terms will be illustratively discussed in regard to specific embodiments or systems to facilitate the discussion. However, as would be readily apparent to a person of ordinary skill in the art, these terms should be understood to encompass other similar applications and embodiments wherein the present invention could be readily applied. In the figures discussed further below, devices having a similar function in each of the figures are designated with a similar tens-digit number.

In FIG. 1, a system 100 is shown having a phone base/phone answering machine 110 and a phone headset 170. The phone base 110 and the phone headset 170 are operatively coupled together for operating as is known in the art as well as for operating in accordance with the present invention. In the phone base 110, there is a ringer actuator 120 operatively coupled to a speaker 150 via a switching device 160 illustratively shown as a relay device. The operation of ringer actuators and ringer output devices are well known by a person of ordinary skill in the art and will not be discussed further herein. Suffice it to say that in a phone ringer, the device shown as a speaker, could well be a simple bell system, such as a solenoid, clapper, bell, etc., or any other known device for produce an auditory signal indicating that an incoming telephone call is being received. As is further known, the auditory signal may be accompanied by a visual indicator, such as a flashing or steady visual
signal, such as a light, or in some embodiments, the visual signal may replace the auditory signal as the sole indication of an incoming call.

In the illustrative embodiment shown in FIG. 1, the switching device 160 contains a switch 164 and a solenoid device 162. As is well known in the art of switching devices, the solenoid device 162 is utilized for moving the switch from a first position 166 to a second position 168. In the first position 166, the ringer actuator 120 is coupled to the speaker 150. In the second position 168, the ringer actuator 120 and speaker 150 are decoupled. In this way, the system in accordance with the present invention is operative to stop the incoming call indicator signal, such as the ringer output auditory signal, from continuing in response to an incoming call as further described herein below.

The phone headset 170 contains a phone silence actuator 180. The phone silence actuator 180 may be a simple mechanical device or may be a processor device that may serve the following described functions or may be combined to perform numerous other typical phone headset functions as would be readily understood in the telephone art. In accordance with an embodiment of the present invention, the phone silence actuator 180 contains two user selectable inputs, such as buttons, for enabling the user to operate the phone silence actuator to operate in one of two operative modes. In a first mode of operation of the phone silence actuator 180, a silence button 182 is utilized by the user when the user does not wish to be further disturbed by an incoming call indicator signal. In the first mode of operation, depression by the user of the silence button 182 causes the phone silence actuator to send a first phone silence actuator signal to a receiver 130, contained within the phone base 110 and coupled to the solenoid 162. In response to the first received signal, the solenoid 162 decouples the ringer actuator 120 from the speaker 150 to stop the incoming call indicator signal.

In a second mode of operation of the phone silence actuator 180, a phone answering machine actuation button 184 is utilized also by the user when the user does not wish to be further disturbed by an incoming call indicator signal. In the second mode of operation, depression of the phone answering machine actuation button 184 causes the phone silence actuator 180 to send a second phone silence actuator signal to the receiver 130. In response to the second received signal, the solenoid 162 decouples the ringer actuator 120 from the speaker 150 to stop the incoming calling indicating signal and also causes the phone answering machine to answer the phone. The phone answering machine may answer the phone after some delayed time as is known in the art, or the phone answering machine may immediately answer the phone in response to the second received signal. In this case, the
switching device 160 may be not included in the phone base 110 since the answering machine immediately answering the incoming call, in effect, stops the incoming call indicator signal. In addition, clearly the answering machine may be a separate device not incorporated into the phone base. In these embodiments, the switching device 160 may produce a signal to activate the external answering machine to respond as described above.

In further embodiments, one of buttons 182, 184 may be deleted and one of the respective above described modes may also be deleted from the system 100. In other embodiments, one of the buttons 182, 184 may be deleted and both of the above-described modes may be operable by different input sequences of input selections on the one remaining button. For example, a single depression of the remaining button may activate the phone silence mode of actuation while repeated depression of the remaining button may activate the phone machine-answering mode of actuation.

FIG. 2 shows an embodiment 200 of the present invention including a phone base/answering machine 210 and a phone headset 270. The phone base 210 contains a processor 260 and a speaker 250, operatively coupled together for producing the incoming call indicator signal. Further, the processor 260 may be a dedicated processor for operating in accordance with the present invention or may be a general purpose processor for further performing standard phone base operation function as would be readily understood by a person of ordinary skill in the art.

The phone headset 270 contains a phone silence actuator 280 that operates similar to the phone silence actuator 180 shown in FIG. 1, except that the silence button 182 and the phone machine actuation button 184 are deleted as described herein below. In place of the buttons 182, 184, the phone silence actuator 280 is operatively coupled to an auditory input 282 for receiving a user's auditory input signal. In this embodiment, the phone silence actuator 280 contains at least a sound detection system for detecting the user's auditory input signal. In some embodiments, the phone silence actuator 280 also contains a sound discriminating system for discriminating between one of two or more different user input auditory signals.

In these embodiments, in response to the user input auditory signal/signals, the phone silence actuator 280 transmits at least one of the first or second signals to the processor 260 for stopping the incoming call indicator signal from being produced. In response to the received at least one of the first or second signals, the incoming call indicator signal may be stopped and/or the phone answering machine may be actuated. In one embodiment, the phone silence actuator 280 containing the sound discriminating system may discriminate
between the different user input auditory signals to determine which of the first or second signals to send to the base unit 210. For example, if the user input auditory signal is stop, stop ringing, or the like, the phone silence actuator 280 may produce the first signal. If the user input auditory signal is answer, answer the phone, or the like, the phone silence actuator 280 may produce the second signal. Systems for discriminating between different user input auditory signals are known and will not be described further herein.

FIG. 3 shows an embodiment 300 of the present invention wherein a phone silence actuator 370 is incorporated into a base station 310 as opposed to a separate phone headset as shown in FIGs. 1 and 2. The phone silence actuator 370 is operatively coupled to a processor 360. The phone silence actuator 370 may have buttons 182, 184 and/or an auditory input 282. The operation of the phone silence actuator 370 and the processor 360 may be similar to as shown in either of FIGs. 1 and 2 phone silence actuators and processors/ringer actuator and switching device, respectively, and accordingly, will not be described further herein.

FIG. 4 is a flow diagram 400 illustrating an operation of a system in accordance with the illustrative embodiments described herein above. In act 410, the system receives an incoming call. In act 420, the system starts the incoming phone call indicator signal. In act 430, the system may receive a phone silence actuation signal. In a case wherein no phone silence actuation signal is received, the incoming phone call indicator signal is continued in act 440. In a case wherein a phone silence actuation signal is received during act 430, then in act 450, the system discriminates which of the first or second phone actuation signals is received by the system. If the first phone actuation signal is received, then in act 470, the system deactivates the incoming phone call indicator signal. If the second phone actuation signal is received, then in act 460, the system sets the answering machine to answer the incoming call. As would be readily apparent to a person of ordinary skill in the art, if the system does not contain the user input auditory discriminator, then act 450 may be eliminated and one of acts 460, 470 may be directly initiated in response to receiving the phone silence actuator signal in act 430.

Finally, the above-discussion is intended to be merely illustrative of the invention. Numerous alternative embodiments may be devised by those having ordinary skill in the art without departing from the spirit and scope of the following claims.
CLAIMS:

1. A telephone system characterized by:
   a phone silence actuator (280) configured to receive user input and to produce
   a phone silence actuator signal in response; and
   an incoming call indicator device (260) operatively coupled to the phone
   silence actuator, the incoming call indicator device configured to produce an incoming call
   indicator signal in response to an incoming call and to stop producing the incoming call
   indicator signal in response to the phone silence actuator signal.

2. The telephone system of Claim 1, comprising:
   a phone base (210); and
   a phone headset (270), wherein the phone silence actuator (280) is contained
   within the phone headset (270) and the incoming call indication device (260) is contained
   within the phone base (210).

3. The telephone system of Claim 1, wherein the phone silence actuator signal
   comprises at least one of first and second phone silence actuator signals and the phone
   silence actuator (280) comprises first and second user input devices (182, 184) each
   configured to produce one of the first and second phone silence actuator signals, wherein in
   response to receipt of the first phone silence actuator signal, the incoming call indicator
   device (260) is configured to stop producing the incoming call indicator signal and in
   response to receipt of the second phone silence actuator signal, the incoming call indicator
   device (260) is configured to activate a telephone answering machine to answer the phone.

4. The telephone system of Claim 3, wherein the phone silence actuator (280)
   comprises a user input discriminating device (282) configured to discriminate between at
   least two different user inputs and to produce one of the first and second phone silence
   actuator signals dependent one which of the at least two different user inputs is received.
5. The telephone system of Claim 4, wherein the user input discriminating device (282) is a user input voice discriminating device.

6. The telephone system of Claim 1, wherein the incoming call indicator device (260) is a general purpose processor.

7. The telephone device of Claim 1, wherein the incoming call indicator device (260) is configured to produce at least one of an auditory and visual incoming call indicator signal.
FIG. 3

FIG. 4

RECEIVE INCOMING CALL

START RINGER

RECEIVE PHONE SILENCE ACTUATION?

IS FIRST SIGNAL RECEIVED?

CONTINUE RING

DEACTIVATE RINGER

SET ANSWERING MACHINE TO ANSWER PHONE