

Device for transmitting character data as dial tones over the public telephone network

The invention relates to a device as defined in the opening part of Claim 1 to a service device as defined in the opening part of Claim 10 and to a method of sending character data, an e-mail message, an e-mail address or scan data via a telephone network.

5 Such a device of the type defined in the opening part of Claim 1 is known from the document WO 97/10668 and takes the form of a fax apparatus. The known fax apparatus is connected to the public telephone network and is adapted to transmit fax messages in a fax mode and e-mail messages in an e-mail mode.

 The known fax apparatus has a numerical keyboard by means of which
10 telephone numbers of further fax apparatuses or other receiving devices can be entered and by which corresponding numerical data are supplied. The numerical data can be applied to a telephone interface which includes dial tone generator means. The dial tone generator means are adapted to generate two dial tones (Dual Tone Multi-Frequency: DTMF) for each digit of a telephone number entered by means of the numerical keyboard in accordance with the tone
15 dial system and to establish a telephone connection via the public telephone network.

 The known fax apparatus further has a character keyboard having keys for the letters of the alphabet as well as special characters and the so-called AT symbol (@) required for the entry of an e-mail address. By means of the character keyboard e-mail addresses can be entered as address information and, if desired, e-mail messages as message information, the
20 character keyboard being capable of supplying said information as character data.

 The known fax apparatus has scanner means with the aid of which graphic information on a sheet of paper can be scanned and which can supply scan data corresponding to said graphic information to a data/fax modem of the fax apparatus. The data/fax modem comprises a fax modem and a data modem. When the fax apparatus is in the fax mode the scan
25 data form a fax message and can be transmitted as fax data to a further fax apparatus connected to the public telephone network by means of the fax modem of the data/fax modem. The fax modem of the known fax apparatus is adapted to transmit and to receive fax data in accordance with the ITU-T-T recommendation V.17 or equivalent recommendations. According to the ITU-T-T recommendation V.17 (14,400 bits per second) fax data are

transmitted in a so-called half-duplex data transmission mode, in which the fax data can essentially be received or transmitted only alternately.

When an e-mail mode is activated in the known fax apparatus the known fax apparatus is adapted to establish a telephone connection to a service device via the public telephone network. The service device is formed by a computer server connected to the internet. The computer server supports the transfer of e-mail messages to a receiving device identified by the e-mail address via the internet in accordance with an SMTP transfer protocol (Simple Mail Transfer Protocol). The computer server further supports the reception of e-mail messages from the internet in accordance with a POP receiving protocol (Post Office Protocol).

The known fax apparatus has e-mail generating means adapted to generate transmission data forming an e-mail for the e-mail address entered by means of the character keyboard. Scan data supplied by the scanner means are then attached to the e-mail as an e-mail message. The transmission data generated by the e-mail generating means and forming an e-mail are transmitted from the data modem to the service device via the telephone connection in accordance with the SMTP transfer protocol and are transferred from this service device to the respective receiving device via the internet.

The data modem is adapted to transmit and receive transmission data in accordance with the ITU-T recommendation V.34. In accordance with the ITU-T recommendation V.34 (28.800 bits per second) transmission data are transmitted in a so-called duplex transmission mode in which transmission data are received and transmitted simultaneously.

In order to allow duplex data transmission a data modem should have echo compensation means in order to filter out echo data of the transmitted transmission data. Echo data are produced as a result of reflections in the data modem itself, in the telephone network as well as in the data modem of the receiving device and they exhibit different delay times. Echo compensation means are usually formed by a digital signal processor DSP and a RAM memory.

The known fax apparatus for the transmission of e-mail messages has the disadvantage that the fax apparatus is expensive and technically very intricate owing to the provision of a data modem.

It is an object of the invention to preclude the afore-mentioned problems and to provide a method of sending character data, an improved device and an improved service

device of the types specified in the opening paragraph. This object is achieved by means of the measures defined in the characterizing part of Claim 1 and by the method defined in Claim 14. As a result of this, character data entered by means of the character keyboard are transmitted as dial tones to a service device as defined in Claim 10, which derives the transmitted
5 character data from the received dial tones.

This has the advantage that a device for transmitting character data provided in a telephone, a fax apparatus or in an answering device of a user need not include a data modem, as a result of which such devices are substantially cheaper and technically simpler.

The measures defined in Claim 2 and the method defined in Claim 15 have the
10 advantage that address data and message data of an e-mail entered by means of the character keyboard can be transmitted to the service device as dial tones. E-mail generating means provided in the service device generate transmission data in accordance with the SMTP transfer protocol and transmit said data as an e-mail to the receiving device corresponding to the address data.

15 This has the advantage that a device for transmitting e-mail is obtained which neither has a data modem nor e-mail generating means and which is consequently cheap and technically simple.

The measures taken in a device as defined in Claim 3, a service device as defined in Claim 11 and a method defined in Claim 16 make it possible that a fax apparatus
20 including the device can fax scan data representing graphic information on a sheet as fax data to the service device as defined in Claim 11 and an e-mail address can be transmitted as transmission data to this service device. Subsequently, e-mail generating means of the service device generate a corresponding e-mail to which the scan data have been added as an attachment and transfer the e-mail to the respective receiving device. This yields the advantage
25 that fax messages can be transmitted as e-mail messages substantially without any additional means in the fax apparatus.

The measures taken in a device as defined in Claim 4 and a service device as defined in Claim 12 yield the advantage that it is possible to retrieve the content of an internet site by means of a fax apparatus which includes the device. For this purpose, the fax apparatus
30 need not have browser means as formed, for example, by the Internet Explorer®, so that the fax apparatus can be adapted to call internet sites in a very cheap and technically simple manner.

The measures taken in a device as defined in Claim 6 and a service device as defined in Claim 13 yield the advantage that, for example, sound signals picked up by a

microphone of a telephone which includes the device can be transmitted to the service device and can be transmitted from this service device to the respective receiving device as voice mail. Thus, it is possible to realize a telephone or, for example, a telephone answering device in a very cheap and technically simple manner.

5 Voice mails received by the service device defined in Claim 13 can be supplied to the device defined in Claim 7 as sound information, which information can advantageously be stored in the device and can be reproduced by a user at an arbitrary time.

10 The measures defined in Claim 8 yield the advantage that for each character of the character data only two numerical data items have to be transmitted as dial tones and the character data can therefore be transmitted particularly rapidly and efficiently from the device to the service device.

15 The measures defined in Claim 9 have the advantage that the device in accordance with the invention is also adapted to receive character data transmitted as dial tones. Character data may represent, for example, message information of an e-mail message or set-up information, as for example the telephone numbers of the service device.

 The invention will now be described in more detail with reference to five examples of use of an embodiment shown in the drawings and given by way of example, to which the invention is not limited.

20 Figure 1 is a block diagram which diagrammatically shows a device for transmitting character data, which device is included in a combination apparatus which includes telephone answering means and fax means and which is connected to a service device via the public telephone network.

25 Figure 2 shows a coding table in accordance with which character data are coded into transmission data in the form of numerical data by coding means of the combination apparatus.

 Figure 3 is a table showing examples of character data and corresponding transmission data, by means of which the embodiment is elucidated.

30 Figure 1 is a block diagram which diagrammatically shows a combination apparatus 1 which is located in Austria and which comprises telephone answering means 2 and fax means 3. The combination apparatus 1 is connected to an Austrian telephone network PSTN1 in Austria. A first service device formed by a first computer server 4 is also connected

to the Austrian telephone network PSTN1. The first computer server 4 is further connected to the internet NET.

Moreover, a second computer server 5 is connected to the internet NET and forms a second service device located in Japan. The second computer server 5 is connected to a second public telephone network PSTN2 in Japan. A telephone 6 and a fax apparatus 7, which are both located in Japan, are also connected to the Japanese telephone network PSTN2.

A third computer server 8 is likewise connected to the internet NET and comprises memory means for storing a plurality of internet sites identified by an internet site address IA. The third computer server 8 is located in the USA.

A fourth computer server 9 is also connected to the internet NET and is adapted to receive e-mail messages from the internet NET in accordance with a POP receiving protocol (Post Office Protocol) and to transfer e-mail messages via the internet NET in accordance with an SMTP transfer protocol (Simple Mail Transfer Protocol). The fourth computer server 9 is located in France and is connected to a personal computer 10, which is also located in France. By means of the personal computer 10 e-mail messages received by the fourth computer server 9 can be collected or e-mail messages can be sent to the fourth computer server 9 in order to be transferred.

The telephone answering means 2 of the combination apparatus 1 include a handset 11, which comprises a loudspeaker 12 and a microphone 13. The microphone 13 forms input means for the reception of sound signals TS and is adapted to supply sound information TI formed by electrical signals. Sound information TI supplied by the microphone 13 can be applied to sound processing means 14 of the telephone answering means 2.

The sound processing means 14 are adapted to amplify and to filter sound information TI and to supply processed sound information TI. Processed sound information TI can be applied to sound storage means 15 of the telephone answering means 2 and can be stored therein. The sound storage means 15 are formed by a mechanical deck for recording and reproducing electric signals on a magnetic tape and perform the function of a telephone answering device.

The sound processing means 14 can supply processed sound information TI to the Austrian telephone network PSTN1. Likewise, the Austrian telephone network PSTN1 can receive sound information TI and, after processing in the sound processing means 14, this information can be applied to the loudspeaker 12 of the handset 11.

The telephone answering means 2 include a numerical keyboard 16 for the entry of number data ND representing a telephone number of a receiving device. The

numerical keyboard 16 has a key for each of the digits 0 to 9 and four further keys for special functions. Keys for special functions are, for example, the * key or the # key.

Number data ND supplied by the numerical keyboard 16 can be applied to data processing means 17 of the telephone answering means 2. The data processing means 17 can
5 either store the number data ND in data storage means 18 or supply said data to first dial tone generator means 19.

The first dial tone generator means 19 are adapted to generate two dial tones WT (Dual Tone Multi-Frequency: DTMF) for each digit of a telephone number entered by means of the numerical keyboard in accordance with the tone dial system. The dial tone
10 generator means 19 are adapted to supply generated dial tones WT to Austrian telephone network PSTN1 and to establish a telephone connection with a receiving device that is also connected to the Austrian telephone network PSTN1.

The fax means 3 of the combination apparatus 1 include scanner means 20. The scanner means 20 are adapted to scan a sheet loaded into the scanner means 20 and to supply
15 scan data SD comprising graphic information. Graphic information may include information relating to text and drawings printed on the sheet.

The fax means 3 further include a first fax modem 21. The first fax modem 21 is adapted to transmit and receive fax data FD corresponding to scan data SD in accordance with an ITU-T recommendation V.17. In accordance with the ITU-T recommendation V.17
20 fax data FD are transmitted via the Austrian telephone network PTSN1 in a so-called half-duplex data transmission mode, in which the fax data FD are essentially only received or transmitted alternately.

The fax means 3 further include printing means 22 for printing out print data DD. The first fax modem 21 can supply fax data FD received by this first fax modem 21 in a
25 half-duplex data transmission mode as print data DD to the printing means 22 in order to be printed.

The combination apparatus 1 further includes a device 23 for transmitting character data ZD, which may also represent letters of the alphabet, to the first service device formed by the first computer server 4 via the Austrian telephone network PSTN1.

30 The device 23 has a character keyboard 24 for the entry of character data ZD representing address information or message information. The character keyboard 24 has a key for each letter of the alphabet and keys for special characters, including a key for the so-called AT symbol (@). The character keyboard 24 further has keys for activating modes of operation of the combination apparatus.

Figure 2 is a coding table 25 which gives all the character data ZD which can be entered by means of the character keyboard 24. Character data ZD supplied by the character keyboard 24 can be applied to coding means 26 of the device 23. The coding means 26 are adapted to encode character data ZD into transmission data UD formed by number data ND in accordance with the coding table 25.

For example, character data ZD of the letter "E" are then coded into transmission data UD = "37". The transmission data UD are each time formed by two successive number data ND. For the transmission data UD = "37" these are the number data ND = "3" and ND = "7".

Transmission data UD determined by the coding means 26 and formed by number data ND can be applied to the data processing means 17. The data processing means 17 are adapted either to store the transmission data UD in the data storage means 18 or to supply the number ND to the first dial tone generator means 19.

This has the advantage that character data ZD entered by means of the character keyboard 24 can be transferred to a receiving device via a public telephone network PSTN as dial tones WT. Further advantages will become apparent from the following examples of use.

The device 23 further comprises first dial tone detector means 27. The dial tone detector means 27 are adapted to receive dial tones WT from the Austrian telephone network PSTN1 and to supply number data ND corresponding to received dial tones WT.

The device 23 further comprises decoding means 28 to which number data ND supplied by the dial tone detector means 27 can be applied. The decoding means 28 are adapted to decode number data ND forming transmission data UD and applied to the decoding means 28 and to supply character data ZD. The decoding means 28 decode in accordance with the coding table 25 shown in Figure 2. For example, number data ND = "5" and ND = "2" applied to the decoding means 28 and forming the transmission data UD = "52" are decoded as character data ZD = "T". Character data ZD supplied by the decoding means 28 can be applied to the printing means 22 in order to be printed.

This has the advantage that character data ZD can be transferred to the combination apparatus 1 via a public telephone network as dial tones WT and that the combination apparatus need not include a - hitherto customary - data modem for the reception of character data ZD. As a result of this, the combination apparatus can be realized in a technically very simple and cheap manner.

The character data ZD supplied by the decoding means 28 can also be applied to the data storage means 18. Such character data ZD can be transferred to the combination

apparatus 1 as dial tones by an arbitrary transmitting device, for example in order to update set-up information in the combination apparatus 1. Thus, for example a new telephone number of the first computer server 4 is transmitted to the combination apparatus 1 and stored in the data storage means 18.

5 This has the advantage that settings and information in the combination apparatus 1 can be adapted and updated by, for example, a transmitting device located in another country.

 The sound processing means 14, the sound storage means 15, the data processing means 17, the data storage means 18, the first dial tone generator means 19, the
10 first fax modem 21 and the first dial tone detector means 27 constitute first interface means 29 of the combination apparatus 1. The first interface means 29 enable sound information TI, fax data FD and dial tones WT to be transmitted and received via the Austrian telephone network PSTN1.

 The first computer server 4 has second interface means 30 adapted to receive
15 and to transmit sound information TI, fax data FD and dial tones WT via the Austrian telephone network PSTN1. The first computer server 4 has first service processing means 31 for processing data and information received or to be transmitted.

 The first computer server 4 further comprises a first data modem 32 which connects the first computer server 4 to the internet NET. The first data modem 32 is adapted to
20 transmit and receive e-mail data ED, content data ID and sound data TD in accordance with the ITU-T recommendation V.34. In accordance with the ITU-T recommendation V.34 data are transmitted at 28.800 bits per second in a so-called duplex data transmission mode, in which the data are received and transmitted at the same time.

 The second interface means 30 include second dial tone detector means 33, a
25 second fax modem 34 and second dial tone generator means 35. The operation of the second dial tone detector means 33 of the second interface means 30 corresponds to the operation of the first dial tone detector means 27 of the first interface means 29, as described hereinbefore. Furthermore, the operation of the second fax modem 34 of the second interface means 30 corresponds to the operation of the first fax modem 21 of the first interface means 29, as
30 described hereinbefore. Finally, the operation of the second dial tone generator means 35 of the second interface means 30 corresponds to the operation of the first dial tone generator means 19 of the first interface means 29, as described hereinbefore.

 The first service processing means 31 include first e-mail generating means 36. Number data ND supplied by the second dial tone detector means 33 can be applied to the first

e-mail generating means 36. Moreover, scan data SD supplied by the second fax modem 34 can be applied to the first e-mail generating means 36. Furthermore, sound information TI from the Austrian telephone network PSTN1 can be applied to the first e-mail generating means 36. Thus, the first e-mail generating means 36 are adapted to generate e-mail data ED of an e-mail message in accordance with the SMTP transfer protocol (Simple Mail Transfer Protocol). During the generation of an e-mail message the e-mail generating means 36 are also adapted to decode character data contained in transmission data UD formed by supplied number data ND, the e-mail generating means 36 forming decoding means. This will be illustrated by means of the examples of use hereinafter.

10 The first e-mail generating means 36 are further adapted to supply an internet site address IA applied to the first e-mail generating means 36 as number data ND. This will be elucidated hereinafter by means of the fifth example of use.

 The first service processing means 31 further include first browser means 37. The first browser means 37 are formed by a personal computer which carries out the well-known internet browser program "Internet Explorer®". The first browser means 37 can receive an internet site address IA from the e-mail generating means 36, upon which the first browser means 37 are adapted to determine the content data ID representing the content of this internet site. This will be elucidated hereinafter by means of the fifth example of use.

 The first service processing means 31 further include first e-mail processing means 38. The first e-mail processing means 38 are adapted to receive e-mail messages formed by e-mail data ED in accordance with the POP receiving protocol (Post Office Protocol).

 There are different kinds of e-mail messages but they all include address information identifying the receiver of the e-mail message and message information forming the actual message content of the e-mail message. Message information can be formed by ASCII text or by an attachment of the actual e-mail message. Such an attachment can be formed, for example, by sound data TD containing sound information and stored as a *.WAV file. However, such an attachment may for example also be formed scan data SD containing graphic information and stored as a *.TIF file.

30 The first e-mail processing means 38 are adapted to supply scan data SD to the second fax modem 34, number data ND to the second dial tone generator means 35, or sound information TI to the combination apparatus 1 via the Austrian telephone network PSTN1, depending on the type of e-mail message received. This will be elucidated by means of the examples of use hereinafter.

The second computer server 5 includes third interface means 39, second service processing means 40 and second data modem 41. The third interface means 39 include third dial tone detector means 42, a third fax modem 43 and third dial tone generator means 44. The second service processing means 40 include second e-mail generating means 45, second browser means 46 and second e-mail processing means 47. The construction and operation of the second computer server 5 corresponds wholly to the construction and operation of the first computer server 4 described in detail hereinbefore.

Figure 3 shows a table 48 of examples of use, which gives the character data ZD and corresponding transmission data UD and by means of which examples of use of the embodiment shown in Figure 1 will be elucidated.

In a first example of use an e-mail message is entered by means of the character keyboard and is transmitted by means of the combination apparatus 1 to the personal computer 10 having the e-mail address "AB@XY.COM". For this purpose, the user of the combination apparatus 1 actuates a given key of the character keyboard 24 and activates a first e-mail mode in the combination apparatus 1. Subsequently, the user of the combination apparatus 1 enters the e-mail address of the personal computer 10 by means of the character keyboard 24. As a result of this, character data ZD specified in the second row of the table 48 of examples are supplied to the coding means 26.

The coding means 26 encode said character data ZD in accordance with the coding table 25 and supply the transmission data UD specified in the second row of the table 48 of examples to the data processing means 17. The data processing means 17 store said transmission data UD as address information of the e-mail message in the data storage means 18.

After having entered the complete e-mail address the user actuates a special key of the character keyboard 24 for subsequent entry of the actual message content "Call me, Jim" of the e-mail message by means of the character keyboard 24. The character data ZD supplied by character keyboard 24 are specified in the third row of the table 48 of examples. The coding means 26 subsequently supply the transmission data UD given in the third row of the table 48 to the data processing means 17. The data processing means 17 store the transmission data UD as message content of the e-mail message in the data storage means 18.

Subsequently, the user of the combination apparatus 1 actuates a given key of the character keyboard 24 in order to send the e-mail message to the personal computer 10. After this, the data processing means 17 read the number data ND from the data storage means

18, which data represent the telephone number of the first computer server 4, and supply said number data ND to the first dial tone generator means 19.

In response thereto, the first dial tone generator means 19 establish a telephone connection to the first computer server 4 via the Austrian telephone network PSTN1. When
5 there is a telephone connection between the combination apparatus 1 and the first computer server 4 the data processing means 17 are adapted to read number data ND from the data storage means 18, which number data identify the first e-mail mode of the combination apparatus 1 for the first computer server 4. Said number data ND are subsequently applied to the first dial tone generator means 19, which transmit corresponding dial tones WT to the first
10 computer server 4. These dial tones WT are detected by the second dial tone detector means 33 and corresponding number data ND are applied to the first e-mail generating means 36. After this, the e-mail generating means 36 await address information and message information corresponding to the first e-mail mode from the combination apparatus.

Subsequently, the data processing means 17 read the address information of the
15 number data ND forming the e-mail message from the data storage means 18 and apply said number data ND to the first dial tone generator means 19. The first dial tone generator means 19 subsequently transmit corresponding dial tones WT to the first computer server 4 via the Austrian telephone network PSTN1. The second dial tone detector means 33 detect received dial tones WT and supply corresponding number data ND to the first e-mail generating means
20 36. The first e-mail generating means 36 interpret said number data ND as transmission data UD representing address information of an e-mail message.

After the address information has been sent by the first dial tone generator means 19 the data processing means 17 observe a 3 second pause in order to allow the first computer server 4 to identify dial tones WT forming address information and dial tones WT
25 forming message information. After expiry of the pause time the data processing means 17 read out the transmission data UD stored in the data storage means 18 as message information of the e-mail message and apply the number data ND forming said transmission data UD to the first dial tone generator means 19. Subsequently, the dial tones WT corresponding to the number data ND are transmitted from the first dial tone generator means 19 to the first
30 computer server 4 via the Austrian telephone network PSTN1.

The second dial tone detector means 33 detect received dial tones WT and apply corresponding number data DT to the first e-mail generating means 36. The first e-mail generating means 36 interpret said number data ND as transmission data UD which represent message information of an e-mail message.

With the aid of the coding table 25 the first e-mail generating means 36 decode character data ZD of the address information and the message information of the e-mail message and generate e-mail data ED in accordance with the SMTP transfer protocol as e-mail message. The e-mail message contains the message information in the form of ASCII text. The e-mail generating means 36 supply the e-mail data ED of the e-mail message to the first data modem 32.

On the basis of the address information of the e-mail message the first data modem 32 detects that the e-mail message is to be transmitted to the fourth computer server 9. The first data modem 32 then transfers the e-mail data ED to the fourth computer server 9 via the internet NET. The fourth computer server 9 stores the e-mail data ED of the received e-mail message in accordance with the POP receiving protocol. The personal computer 10 periodically transmits inquiry information to the fourth computer server 9 to inquire whether an e-mail message for the personal computer 10 has arrived. Subsequently, the e-mail data ED are transferred from the fourth computer server 9 to the personal computer 10.

The advantage apparent from the first example of use of the combination apparatus 1 is that by means of the combination apparatus 1 an e-mail message can be generated very simply and can be transferred to the first computer server 4 by means of a national telephone call via the Austrian telephone network at particularly low cost. The transfer of the e-mail message from Austria to the personal computer 10 located in the USA is effected via the internet NET, i.e. without additional telephone fees being charged.

In a second example of use of the combination apparatus 1 the personal computer 10 sends an e-mail message to the combination apparatus 1, which message is printed out by the printing means 22 of the combination apparatus 1. The user of the personal computer 10 then generates an e-mail message formed by e-mail data ED, the address information of the message specifying the e-mail address of the combination apparatus 1. The personal computer 10 transfers this e-mail message to the fourth computer server 9, which detects from the address information of the e-mail message that the e-mail message is to be transmitted to the fourth computer server 4. Subsequently, e-mail data of the e-mail message are applied from the fourth computer server 9 to the first data modem 32 via the internet NET.

E-mail data ED received from the first data modem 32 are applied to the first e-mail processing means 38. The first e-mail processing means 38 include a memory which stores the e-mail addresses and associated telephone numbers of the devices such as the device 23 for transmitting and receiving character data ZD, for which the first computer server 4 constitutes a service device. The first e-mail processing means 38 subsequently apply number

data ND representing the telephone number of the combination apparatus 1 to the second dial tone generator means 35. The second dial tone generator means 35 supply corresponding dial tones WT to the Austrian telephone network PSTN1 and thus establish a telephone connection with the combination apparatus 1.

5 When there is a telephone connection from the first computer server 4 to the combination apparatus 1 the first e-mail processing means 38 supply number data ND to the second dial tone generator means 35, which activate an e-mail receiving mode in the combination apparatus 1. Subsequently, the first e-mail processing means 38 determine transmission data UD for the address information and the message information of the received
10 e-mail message with the aid of the coding table 25. For the time being, transmission data UD of number data ND forming the address information are applied to the second dial tone generator means 35 and, after expiry of a pause interval transmission data UD of number data ND forming message information are applied to the second dial tone generator means 35.

 The dial tones WT from the second dial tone generator means 35 of the first
15 computer server 4 are received by the combination apparatus 1 and detected by means of the first dial tone detector means 27. The first dial tone detector means 27 first apply transmission UD of the address information of the e-mail message as number data ND and then transmission data UD of the message information of the e-mail message as number data ND to the decoding means 28.

20 The decoding means 28 decode received number data ND by means of the coding table 25 and supply corresponding character data ZD of the address information and the message information of the received e-mail message to the printing means 22, which print the e-mail message.

 The advantage apparent from the second example of the use of the combination apparatus 1 is
25 that an e-mail message can be received as a fax message and can be printed directly by the combination apparatus 1, without a data modem being required for this purpose in the combination apparatus 1.

 In a third example of the use of the combination apparatus 1 the combination apparatus 1 in Austria sends a fax message as an e-mail message to the fax apparatus 7 in
30 Japan. For this purpose, the user of the combination apparatus 1 actuates a given key of the character keyboard 24 and activates a second e-mail mode in the combination apparatus 1.

 Subsequently, the user of the combination apparatus 1 enters the telephone number of the fax apparatus 7 by means of the numerical keyboard 16. The number data ND corresponding to the telephone number are supplied from the number keyboard 16 to the data

processing means 17. The data processing means 17 discern from the kind of telephone number that the fax apparatus 7 is located in Japan and - as described hereinbefore - establish a telephone connection with the first computer server 4 via the Austrian telephone network PSTN1. When there is a telephone connection between the combination apparatus 1 and the first computer server 4 the data processing means 17 supply number data stored in the data storage means 18 to the first e-mail generating means 36 of the first computer server 4 via the first dial tone generator means 19 and the Austrian telephone network PSTN1, thereby indicating that the combination apparatus 1 is in the second e-mail mode.

Subsequently, the data processing means 17 supply the number data ND of the telephone number of the fax apparatus 7 to the second dial tone detector means 33 of the first via the first dial tone generator means 19 and the Austrian telephone network PSTN1 and from said detector means to the first e-mail generating means 36 as number data ND of the telephone number of the fax apparatus 7. Subsequently, the user of the combination apparatus 1 loads one or sheets into the scanner 20, whose graphic information forms the message information of the e-mail message.

The scanner means 20 subsequently supply scan data SD to the first fax modem 21. The first fax modem 21 then transmits fax data FD to the second fax modem 34 via the Austrian telephone network PSTN1, which second fax modem supplies corresponding scan data SD to the first e-mail generating means 36. The first e-mail generating means 36 then generate an e-mail message in accordance with the SMTP transfer protocol, the message information of the e-mail message being formed by an attachment with the scan data SD stored as a *.TIF file. The first e-mail generating means 36 supply corresponding e-mail data ED to the first data modem 32.

The first data modem 32 discerns from address information of the e-mail message, which information includes the telephone number of the fax apparatus 7, that the e-mail data must be transferred to the second computer server 5 in Japan. Subsequently, the first data modem 32 transfers the e-mail data ED of the e-mail message to the second data modem 41 of the second computer server 5 via the internet NET. The second data modem 41 supplies the received e-mail data ED to the e-mail processing means 47.

The second e-mail processing means 47 derive the telephone number of the fax apparatus 7 from the address information of the e-mail message and supply number data ND of the telephone number to the third dial tone generator means 44 in order to establish a telephone connection with the fax apparatus 7 via the Japanese telephone network PSTN2.

When there is a telephone connection between the second computer server 5 and the fax apparatus 7 the second e-mail processing means 47 apply the attachment of the received e-mail message to the third fax modem 43 as scan data SD. The third fax modem 43 supplies fax data FD corresponding to the received scan data SD to the fax apparatus 7 via the Japanese telephone network PSTN2, which fax apparatus prints out the fax message.

The advantage apparent from the third example of the use of the combination apparatus 1 is that fax messages can be transmitted particularly simply and at small telephone charges over long distances.

In a fourth example of the use of the combination apparatus 1 a message spoken by the user of the combination apparatus 1 is transmitted to the telephone 6 as voice mail. For this purpose, the user of the combination apparatus 1 actuates a given key of the character keyboard 24 and activates a voice mail mode in the combination apparatus 1. When the combination apparatus 1 is in the voice mail mode the telephone number of a telephone can be entered by means of the numerical keyboard 16 or the e-mail address of a personal computer can be entered by means of the character keyboard 24 in order to specify the receiving device for the voice mail.

In the fourth example of use the user enters the telephone number of the telephone 6 by means of the numerical keyboard 16. The number data ND of the telephone number are stored in the data storage means 18 by the data processing means 17. Subsequently, the user is prompted, by a standard text stored in the sound processing means 14 and supplied to the loudspeaker 12 of the handset 11 as sound information TI, to speak the message to be transmitted into the microphone 13. After this, the user speaks sound signals TS into the microphone 13, which are applied to the sound processing means 14 as sound information TI. In the voice mail mode of the combination apparatus 1 the sound processing means 14 store the sound information TI in the sound storage means 15.

Subsequently, the data processing means 17 - as described hereinbefore - establish a telephone connection with the first computer server 4 via the Austrian telephone network PSTN1. When there is a telephone connection between the combination apparatus 1 and the first computer server 4 the data processing means 17 supply the number data stored in the data storage means 18 to the first e-mail generating means 36 of the first computer server 4 via the first dial tone generator means 19 and the Austrian telephone network PSTN1, to indicate that the combination apparatus 1 is in the voice mail mode.

Subsequently, the data processing means 17 read the number data ND of the telephone number of the telephone 6 out of the data storage means 18 and supply said number

data ND to the e-mail generating means 36 of the first computer server 4 via the first dial tone generator means 19 and the Austrian telephone network PSTN1. The first e-mail generating means 36 generate address information of a voice mail from the received number data ND.

Subsequently, the sound processing means 14 of the combination apparatus 1
5 read out the sound information TI of the spoken message stored in the sound storage means 15 and transfer this information to the first e-mail generating means 36 of the first computer server 4 via the Austrian telephone network PSTN1. The first e-mail generating means 36 generate from the received sound information TI a *.WAV file in which the sound data TD are stored and attach this *.WAV file to the voice mail as an attachment which forms message
10 information.

Subsequently, the first e-mail generating means 36 supply e-mail data ED of the e-mail message whose attachment contains sound data TD to the first data modem 32. The first data modem 32 then transfers the e-mail data ED and the sound data TD to the second computer server 5 in Japan via the internet NET.

15 E-mail data Ed and sound data TD received by the second data modem 41 are applied to the second e-mail processing means 47. From the address information of the voice mail message the second e-mail processing means 47 derive the number data ND of the telephone number of the telephone 6 and apply said data to the third dial tone generator means 44. Subsequently, the third dial tone generator means 44 supply the dial tones WT
20 corresponding to the number data ND to the Japanese telephone network PSTN2, upon which the telephone 6 rings.

When the user of the telephone 6 picks up the handset, as a result of which a telephone connection is established between the second computer server 5 and the telephone 6, the second e-mail processing means 47 transmit sound information TI derived from received
25 sound data TD of the voice mail to the telephone 6 via the Japanese telephone network PSTN2. Thus, the user of the telephone 6 can hear the message from the user of the combination apparatus 1 although his telephone 6 does not have an answering device.

The advantage which is apparent from the fourth example of the use of the combination apparatus 1 is that the user of the telephone 6 can hear the message from the user
30 of the combination apparatus 1 although his telephone 6 does not have an answering device. The combination apparatus 1 does not require a data modem for this purpose.

In a fifth example of the use of the combination apparatus 1 the user of the combination apparatus 1 logs on to an internet site of the internet NET and prints out its content with the aid of the printing means 22. For this purpose, the user of the combination

apparatus 1 actuates a special key of the character keyboard 24 in order to activate an internet mode. Subsequently, the user enters the internet site address IA = "WWW.PHILIPS.COM", specified in the fourth row of the table 48 of examples, by means of the character keyboard 24. The character keyboard 24 supplies corresponding character data ZD to the coding means 26, which in response thereto supply the transmission data UD specified in the fourth row of the table 48 of examples to the data processing means 17.

The data processing means 17 store the number data ND of the internet site address IA in the data storage means 18. Subsequently, the data processing means 17 read the number data ND of the telephone number of the first computer server 4 from the data storage means and establish a telephone connection with the first computer server 4 by means of the first dial tone generator means 19.

Once a telephone connection has been established the data processing means 17 supply number data stored in the data storage means 18 to the first e-mail generating means 36 of the first computer server 4 via the first dial tone generator means 19 and the Austrian telephone network PSTN1, which data indicate that the combination apparatus 1 is in the internet mode. Subsequently, the data processing means 17 read out the number data ND of the internet site address IA, which data are stored in the data storage means 18, and transmit said data as dial tones WT to the first computer server 4 via the first dial tone generator means 19 and the Austrian telephone network.

The second dial tone detector means 33 detect received dial tones WT and supply corresponding number data ND to the first e-mail generating means 36. On the basis of the information that the combination apparatus 1 is in the internet mode the first e-mail generating means 36 supply information specifying the internet site address IA to the first browser means 37.

The first browser means 37 then fetch the content of the internet site identified by the internet site address IA from the third computer server 8. The content data ID representing the content of this internet site are supplied as scan data SD to the second fax modem 34 by the first browser means 37. The second fax modem 34 subsequently transmits corresponding fax data FD to the first fax modem 21 via the Austrian telephone network PSTN1, which modem supplies printing data DD to the printing means 22 and the content of the internet site is printed out.

The advantage which is apparent from the fifth example of the use of the combination apparatus 1 is that the content of internet sites can be retrieved from the internet

NET and printed out very simply by means of the combination apparatus 1 without a data modem being required in the combination apparatus 1.

5 It is to be noted that also the first and the second computer server need not include a data modem and that e-mail data ED and sound data TD may alternatively be transmitted via digital data lines.

10 It is to be noted that the dial tone generator means may also be replaced by pulse generator means, which supply number data ND in accordance with the pulse dial system to a public telephone network. Likewise, the dial tone detector means may be replaced by pulse detector means, which receive pulses from the public telephone network and which supply corresponding number data ND.

It is to be noted that a device in accordance with the invention may also be included in a computer, a video recorder, a kitchen appliance or a television set in order to transmit character data via a public telephone network.

15 It is to be noted that a multitude of methods of coding character data into number data - as for example the ASCII code - which go beyond the coding table 25 are known to the expert, which can likewise be used in coding means in accordance with the invention.

It is to be noted that the character keyboard and the numerical keyboard may be combined in a keyboard which comprises the keys of both keyboards.

CLAIMS:

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1. A device (23) for transmitting character data (ZD), which can also represent letters of the alphabet, to a service device (4, 5) via a telephone network (PSTN1, PSTN2), comprising
a numerical keyboard (16) for the entry of number data (N) representing a telephone number
5 of the service device (4, 5) and comprising
a character keyboard (24) for the entry of character data (ZD) representing address information or message information, and comprising
dial tone generator means (19) to which number data (ND) can be applied and which can supply dial tones (WT) to the telephone network (PSTN1, PSTN2) in order to establish a
10 telephone connection with the service device (4, 5),
characterized in that
coding means (26) for coding character data (ZD) into transmission data (UD) formed by number data (ND), and in that the transmission data (UD) can be supplied to the service device (4, 5) as dial tones (WT) via the telephone network (PSTN1, PSTN2).
- 15
2. A device (23) as claimed in Claim 1, characterized in that character data (ZD) representing an e-mail address and an e-mail message can be entered by means of the character keyboard (24), and in that transmission data (UD) supplied by the coding means (26) can be applied as dial tones (WT) to the service device (4, 5) by the dial tone generator means
20 (19) via the telephone network (PSTN1, PSTN2), in order to transfer the e-mail message to the e-mail address contained in the transmission data (UD).
3. A device (23) as claimed in Claim 1, characterized in that character data (ZD) representing an e-mail address can be entered by means of the character keyboard (24), and in
25 that transmission data (UD) supplied by the coding means (26) can be applied as dial tones (WT) to a service device (4, 5) as claimed in Claim 11 by the dial tone generator means (19) via the telephone network (PSTN1, PSTN2), and in that there have been provided scanner means (20) for scanning a sheet loaded into the scanner means (20) and for supplying scan data (SD) containing graphic information, and in that there has been provided a fax modem





(21) adapted to transmit fax data (FD) corresponding to the scan data (SD) to the service device (4, 5) via the telephone network (PSTN1, PSTN2) in a half-duplex data transmission mode (ITU: V.17), in order to transfer the fax data (FD) as an e-mail attachment to the e-mail address contained in the transmission data (UD).

5

4. A device (23) as claimed in Claim 1, characterized in that character data (ZD) representing an internet site address (IA) can be entered by means of the character keyboard (24), and in that transmission data (UD) supplied by the coding means (26) can be applied as dial tones (WT) to a service device (4, 5) as claimed in Claim 12 by the dial tone generator means (19) via the telephone network (PSTN1, PSTN2), in order to determine content data (ID) representing the content of this internet site, and in that a fax modem (21) is adapted to receive fax data (FD) corresponding to the content data (ID) from the service device (4, 5) via the telephone network (PSTN1, PSTN2) in a half-duplex data transmission mode (ITU: V.17).

10

15 5. A device (23) as claimed in Claim 4, characterized in that fax data (FD) received by the fax modem (21) can be supplied as print data (DD), and in that there have been provided printing means (22) for printing out the print data (DD).

6. A device (23) as claimed in Claim 1, characterized in that there have been provided input means (13) for receiving sound signals and for supplying sound information (TI) which can be transmitted to a service device (4, 5) as claimed in Claim 13 via the telephone network (PSTN1, PSTN2), and in that character data (ZD) representing an e-mail address can be entered by means of the keyboard (24), and in that transmission data (UD) supplied by the coding means (26) can be applied as dial tones (WT) to the service device (4, 5) via the telephone network (PSTN1, PSTN2), in order to transfer the sound information (TI) as sound data (TD) of a voice mail to the e-mail address contained in the transmission data (UD).

20

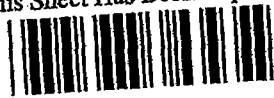
25

7. A device (23) as claimed in Claim 6, characterized in that there have been provided sound storage means (15) for storing the sound information (TI).

30

8. A device (23) as claimed in Claim 1, characterized in that the coding means (26) can encode two numbers formed by number data (ND) as transmission data (UD) for each character of the character data (ZD).





9. A device (23) as claimed in Claim 1, characterized in that there have been provided dial tone detector means (27) for receiving dial tones (WT) from the telephone network (PSTN1, PSTN2) and for supplying number data (ND) corresponding to received dial tones (WT), and in that there have been provided decoding means (28) for decoding number data (ND) applied to the decoding means (28) and forming transmission data (UD) and for supplying character data (ZD).

10. A service device (4, 5) for receiving transmission data (UD) from a device (23) as claimed in Claim 1 via a telephone network (PSTN1, PSTN2), characterized in that there have been provided dial tone detector means (33, 42) for receiving dial tones (WT) from the telephone network (PSTN1, PSTN2) and for supplying number data (ND) corresponding to received dial tones (WT), and in that there have been provided decoding means (36, 45) for decoding character data (ZD) contained in transmission data (UD) formed by supplied number data (ND).

11. A service device (4, 5) as claimed in Claim 10, characterized in that there has been provided a fax modem (34, 43) adapted to receive fax data (FD) representing graphic information from a device (23) as claimed in Claim 3 via the telephone network (PSTN1, PSTN2) in a half-duplex data transmission mode (ITU-T: V.17), and in that there have been provided e-mail generating means (36, 45) for generating an e-mail, which generate from the scan data (SD) contained in the received fax data (FD) an e-mail attachment with an e-mail address contained in the transmission data (UD).

12. A service device (4, 5) as claimed in Claim 10, characterized in that character data (ZD) received from a device (23) as claimed in Claim 4 and decoded by the decoding means (36, 45) represent an internet site address (IA), and in that browser means (37, 46) are adapted to determine the content data (ID) representing the content of this internet site, and in that there has been provided a fax modem (34, 43) adapted to transmit fax data corresponding to the content data (ID) to the device (23) as claimed in Claim 4 via the telephone network (PSTN1, PSTN2) in a half-duplex data transmission mode (ITU-T: V.17).

13. A device (4, 5) as claimed in Claim 10, characterized in that character data (ZD) received by a device (23) as claimed in Claim 6 and decoded by the decoding means (36,



45) represent an e-mail address, and in that there have been provided e-mail generating means (36, 45) for generating a voice mail, sound data (TD) being generated from the received sound information (TI) and being attached to as an attachment to the voice e-mail with an e-mail address represented by the character data (ZD).

5

14. A method of sending character data (ZD) via a telephone network (PSTN1, PSTN2), said method comprising:
providing the character data (ZD);

10 converting the character data (ZD) to transmission data (UD) in the form of dial tones (WT);
transmitting the transmission data (UD) via the telephone network (PST1, PST2).

15. A method of sending an e-mail message to an e-mail address via a telephone network (PSTN1, PSTN2), said method comprising:

15 providing the e-mail message and the e-mail address in the form of character data (ZD);
converting the character data (ZD) to transmission data (UD) in the form of dial tones (WT);
transmitting the transmission data (UD) via the telephone network (PSTN1, PSTN2) to an Internet server for forwarding the e-mail message to the e-mail address.

20 16. A method of sending scan data (SD) to an Internet site address (IA) via a public telephone network (PSTN1, PSTN2), said method comprising:

including the Internet site address (IA) in transmission data (UD) in the form of dial tones (WT);

25 converting the scan data (SD) to fax data (FD) in a form acceptable for transmission over the public telephone network (PSTN1, PSTN2);
transmitting the transmission data (UD) and the fax data (FD) over the public telephone network (PSTN1, PSTN2) to an Internet server (4) for forwarding the scan data (SD) to the Internet site address (IA).



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