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Letter accompanying subsequently filed items

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The document(s) listed below is (are) subsequently filed documents pertaining to the following application:

Application number	10779869.6
Applicant's or representative's reference	FP-10-1002

	Description of document	Original file name	Assigned file name
1	Reply to search opinion/written opinion/IPER	28-01-2013 EPO.pdf	WOREPLY-1.pdf
2	Amended claims with annotations	Amended claims (annotated copy).pdf	CLMS-HWA-1.pdf
3	Amended description with annotations	Amended description (annotated copy).pdf	DESC-HWA-1.pdf
4	Amended claims (clean copy)	Amended claims (clean copy).pdf	CLMS-1.pdf
5	Amended description (clean copy)	Amended description (clean copy).pdf	DESC-1.pdf

Signatures

Place:	**London, England**
Date:	**28 January 2013**
Signed by:	**GB, Phillips & Leigh, M. Hammler 6638**
Association:	**PHILLIPS & LEIGH**
Capacity:	**(Representative)**

CLAIMS

1. A system for generating haptic effects to confirm receipt of a voice command, the system comprising:

a microphone (135, 345);

a housing (105, 605) configured to be contacted by a user;

an actuator (130, 630) in communication with the housing, the actuator configured to output a haptic effect to the housing; and

a processor (110, 430, 620) in communication with the microphone and the actuator, the processor configured to receive speech information from the microphone;

characterised in that the processor is configured to:

(a) recognize the speech information;

(b) subsequently determine a command associated with the recognized speech information; and

(c) if the speech information is recognized and the command is determined:

generate a first actuator signal configured to cause the actuator to output a first haptic effect; and

transmit the first actuator signal to the actuator;

(d) otherwise:

generate a second actuator signal configured to cause the actuator to output a second haptic effect; and

transmit the second actuator signal to the actuator.

2. The system of claim 1, wherein the processor (110, 430, 620) is further configured to, if the speech information is recognized and the command is determined:

execute a function associated with the speech information;

generate a third actuator signal configured to cause the actuator to output a third haptic effect; and

transmit the third actuator signal to the actuator upon completion of execution of the function.

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Comment [MH5]: Re: Item V: it is clear that a 2-step command determination process is envisaged (speech recognition followed by command determination), see e.g. PCT page 3, lines 19-23. Also, it is clear that a 2-step process must be used to allow different error messages to be provided as disclosed e.g. on PCT page 4, at lines 1-3, one haptic effect being output if the speech is not recognised, and a different haptic effect being output if the speech *is* recognised, but does not correspond to a known command. This provides the possibility of better error reporting and better guidance for user corrective action. E.g. if the result is "speech recognised, command not recognised", the user knows that she/he is speaking sufficiently clearly, but should attempt to rephrase the command, as it probably contains words not recognised as command vocabulary. Importantly, a 2-step command determination process as now claimed, allows for far greater flexibility in command recognition, for example the ability to handle synonyms and their permutations. Take the example used in the specific description in relation to a voice activated telephone dialler, of the command "call home". The command vocabulary might not only contain the word "call" as the basic action, but also synonyms such as "telephone", "phone", "ring", "dial", and even slang expressions such as "give a tinkle". Similarly, for the action qualifier or argument, as well as the word "home", synonyms such as "my house", "chez moi", "the gaff" etc. could be provided as part of the command vocabulary. A combination of any word or phrase denoting a basic action and any word or phrase denoting a qualifier/argument can therefore be treated by the processor as a recognizable and actionable command, and be appropriately carried out. It is not necessary to include all the permutations of actions and qualifiers in the command vocabulary express verbis; just the various individual synonymous basic actions and qualifiers. So if there are *m* synonyms for the basic action and *n* synonyms for the qualifier, the number of vocab entries is reduced from $m*n$ to $m+n$.

None of the cited documents disclose or suggest such a 2-step command recognition process; for example D1 merely refers to "one valid instruction that the program module 37 expects to receive from the user, or one of a number of valid instructions that the program module 37 expects to receive from the user" (page 13, lines 1-6). Command recognition in accordance with D1 therefore comprises simple one-to-one matching with individual members of a list of valid instructions. D2 is mainly ... [1]

3. The system of claim 2, wherein the third haptic effect is configured to emulate the function.

4. The system of claim 3, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn.

5. The system of claim 1, further comprising a speaker in communication with the processor (110, 430, 620), and wherein the processor is further configured to:

generate an audio signal configured to cause the speaker to output a sound; and transmit the audio signal to the speaker.

6. The system of claim 1, further comprising a display (650) in communication with the processor (620), and wherein the processor is further configured to:

generate a display signal configured to cause the display to display an image; and transmit the display signal to the display.

7. The system of claim 1, wherein the first haptic effect is configured to emulate the command.

8. A computer-implemented method for generating haptic effects to confirm receipt of a voice command, comprising the step of:

receiving speech information from a microphone (135, 345);

characterised by the steps of :

(a) recognizing the speech information and

(b) subsequently determining a command associated with the speech information;

(c) if the speech information is recognized and the command is determined:

generating a first actuator signal configured to cause an actuator (130, 440, 640) to output a first haptic effect; and

transmitting the first actuator signal to the actuator;

(d) otherwise:

generating a second actuator signal configured to cause the actuator to output a second haptic effect; and

transmitting the second actuator signal to the actuator.

Comment [MH6]: Re: Item VII point 11: We believe this claim to be consistent with the description, as the housing with which the actuators described on page 15 must communicate (as specified in claim 1) can clearly be disposed upon or comprise the back of the wheelchair.

Deleted: 8. The system of claim 1, wherein the microphone, actuator, and processor are disposed within the housing. ¶ 9. The system of claim 1, wherein the housing comprises one of a Bluetooth headset, a Bluetooth earbud, a cell phone, a personal digital assistant, a touch-sensitive surface, a mouse, or a keyboard. 10¶

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9. The computer-implemented method of claim 8, wherein if the speech information is recognized and the command is determined:

a function associated with the command is executed;

a third actuator signal configured to cause the actuator (130, 630) to output a third haptic effect is generated; and

the third actuator signal is transmitted to the actuator upon completion of execution of the function.

10. The computer-implemented method of claim 9, wherein the third haptic effect is configured to emulate the function.

11. The computer-implemented method of claim 10, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn.

12. The computer-implemented method of claim 8, further comprising:

generating an audio signal configured to cause a speaker to output a sound; and transmitting the audio signal to the speaker.

13. The computer-implemented method of claim 8, further comprising:

generating a display signal configured to cause a display to display an image; and transmitting the display signal to the display.

14. The computer-implemented method of claim 8, wherein the first haptic effect is configured to emulate the command.

15. A computer-readable medium comprising program code for executing the method of claim 8

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Comment [MH7]: PCT page 1, lines 28-29

Page 19: [1] Comment [MH5] Martin Hammler 19/12/2012 15:17:00

Re: Item V: it is clear that a 2-step command determination process is envisaged (speech recognition followed by command determination), see e.g. PCT page 3, lines 19-23. Also, it is clear that a 2-step process must be used to allow different error messages to be provided as disclosed e.g. on PCT page 4, at lines 1-3, one haptic effect being output if the speech is not recognised, and a different haptic effect being output if the speech *is* recognised, but does not correspond to a known command. This provides the possibility of better error reporting and better guidance for user corrective action. E.g. if the result is "speech recognised, command not recognised", the user knows that she/he is speaking sufficiently clearly, but should attempt to rephrase the command, as it probably contains words not recognised as command vocabulary. Importantly, a 2-step command determination process as now claimed, allows for far greater flexibility in command recognition, for example the ability to handle synonyms and their permutations. Take the example used in the specific description in relation to a voice activated telephone dialler, of the command "call home". The command vocabulary might not only contain the word "call" as the basic action, but also synonyms such as "telephone", "phone", "ring", "dial", and even slang expressions such as "give a tinkle". Similarly, for the action qualifier or argument, as well as the word "home", synonyms such as "my house", "chez moi", "the gaff" etc. could be provided as part of the command vocabulary. A combination of any word or phrase denoting a basic action and any word or phrase denoting a qualifier/argument can therefore be treated by the processor as a recognizable and actionable command, and be appropriately carried out. It is not necessary to include all the permutations of actions and qualifiers in the command vocabulary express verbis; just the various individual synonymous basic actions and qualifiers. So if there are m synonyms for the basic action and n synonyms for the qualifier, the number of vocab entries is reduced from $m*n$ to $m+n$.

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