



PATENTS ACT 1977

APPLICANT	Suunto OY
ISSUE	Whether patent application GB1120938.4 complies with Sections 1(1)(a), 1(1)(b) and 1(2) of the Patents Act
HEARING OFFICER	P Mason

DECISION

Introduction

- 1 Patent application GB1120938.4 (“the Application”) was filed on 5 December 2011 in the name of Suunto OY. The Application was published as GB2497311 on 12 June 2013.
- 2 Despite several rounds of amendment the applicant was unable to satisfy the examiner that the Application meets the requirements of the Patents Act 1977 (“the Act”). In particular, the examiner maintains that the claims are either not novel or lack an inventive step in light of four patent documents. The examiner also maintains that the invention defined in the claims is excluded from patentability as relating to a computer program as such.
- 3 An agreement could not be reached and so the matter came before me at a hearing on 24 September 2018. The applicant was represented by Mr Howard Wright and Ms Shu Yang of Withers & Rogers LLP and Mr Kristian Luoto of Seppo Laine OY.
- 4 An amended set of claims and description were filed shortly before the hearing on 17 September 2018 along with the applicant’s skeleton argument. It was agreed that these claims should be the ones considered at the hearing and therefore in this decision.

The invention

- 5 The Application relates to improving the adaptability of ‘wristop’ computers with respect to information content provided to the user. A wristop computer is a portable microcontroller-operated computer device adapted for attachment to a user’s wrist – see Figure 1 from the Application, reproduced below. Such a wristop computer can be used for monitoring and/or tracking sports exercises for example when diving. In the invention of the Application the wristop computer obtains physical data such as time, velocity, position, altitude or a physiological variable using sensors or other

data-producing units in or connected to the wristop computer. Users are allowed to define a mathematical formula using input facilities such as a touch screen on the wristop computer. The mathematical formula converts the value of a physical variable into a new result using mathematical operators. The user is given the option of selecting different mathematical operators with different physical parameters and constants and arranging them how they wish with various degrees of complexity. An interpreter is included in the software of the device which is able to convert the inputted mathematical formula into instructions. The instructions can then be read by software on the wristop computer to perform the mathematical function using the physical value. The new result is either displayed on the wristop computer or communicated to another device. In this way the functionality of the wristop computer is not fixed at purchase but the user can configure the device better for his/her needs.

- 6 In a simple example the wristop computer may determine a physical variable such as the number of calories burnt during exercise. The user may input a mathematical formula, which converts this parameter to the number of equivalent chocolate bars burnt by dividing the physical variable by a constant value representing the number of calories in a typical chocolate bar. This converted value is then communicated to the user during exercise. In a more complicated example the wristop computer may instead communicate the power output of the user based on determined physical variables such as the user's altitude and speed and the relevant conversion formula entered by the user.

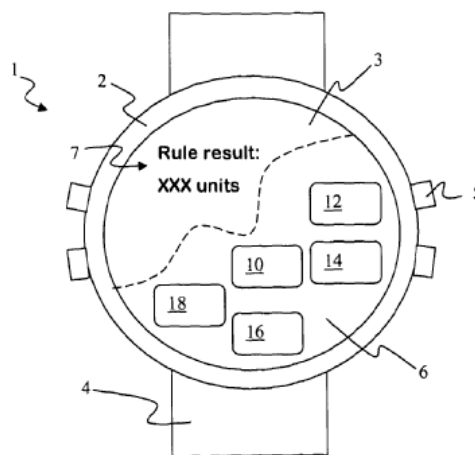


Fig. 1

- 7 The Application currently has 16 claims including one independent claim, claim 1, directed to a wristop computer as follows:

1 A wristop computer comprising

- *a memory means,*
- *a microprocessor capable of running software means stored on said memory means,*
- *hardware means capable of providing at least one physical variable to be read by said software means,*
- *interface means adapted to allow user input into said memory means to define a data structure of a mathematical formula, wherein said*

mathematical formula and said at least one physical variable are on said memory means, the data structure being writable through said interface means, and wherein said writable data structure comprises at least one mathematical operator and at least one physical variable,

- *interpreter means included in said software means adapted to interpret said data structure into instructions, whereby said software means is adapted to read a value of said physical variable and to perform said defined mathematical formula utilizing said value and said instructions provided by said interpreter means, and*
- *communication means for communicating a result of said defined mathematical formula to said user.*

The Issues to be decided

- 8 There are two issues to be decided in relation to the Application. Firstly, whether the invention as defined in claim 1 is both novel and inventive in light of four pieces of prior art. Secondly, whether the invention as defined in claim 1 relates to excluded subject matter, in particular a computer program as such. I will deal with these in turn.

Novelty and Inventive Step – the law

- 9 Section 1(1) of the Act sets out what is required of a patentable invention as follows:

1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say

- (a) the invention is new;*
- (b) it involves an inventive step;*

- 10 The relevant provisions in relation to novelty are found in section 2(1) and section 2(2) which read:

2(1) An invention shall be taken to be new if it does not form part of the state of the art.

2(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.

- 11 The provisions in relation to inventive step are found in section 3 which states:

3. An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

- 12 The Court of Appeal in *Windsurfing*¹ formulated a four-step approach for assessing whether an invention is obvious to a person skilled in the art. This approach was

¹ *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 59

restated and elaborated upon by the Court of Appeal in *Pozzoli*.² Here, Jacob LJ reformulated the *Windsurfing* approach as follows:

- (1)(a) *Identify the notional “person skilled in the art”*
- (1)(b) *Identify the relevant common general knowledge of that person;*
- (2) *Identify the inventive concept of the claim in question or if that cannot be readily done, construe it;*
- (3) *Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;*
- (4) *Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps that would have been obvious to the person skilled in the art or do they require any degree of invention?*

Novelty and Inventive Step - analysis

- 13 Before making a comparison between the claims and the identified prior art documents, Ms Yang drew my attention to some features of claim 1, and how they should be interpreted, particularly in light of the latest amendments. Most of claim 1 is straightforward to construe and requires no further comment. Of particular importance, however, is the part, “interface means adapted to allow user input into said memory means to define a data structure of a mathematical formula ... the data structure being writable through said interface means, and wherein said writable data structure comprises at least one mathematical operator and at least one physical variable”.
- 14 First of all Mr Wright explained that the claims are now limited such that the ‘interface means’ are located on the wristop computer itself. For example on page 10 lines 3-5 of the current description we are told that the interface means “comprises on-device user interface means, such as buttons and display or a touch screen, arranged in the wristop computer”. Other embodiments in the Application which describe interface means comprising data transfer means capable of importing rules are intended to define additional, optional features. Mr Wright confirmed that the applicant is willing to make further amendment to the Application to make this clear.
- 15 Ms Yang emphasized that ‘a data structure of a mathematical formula’ is used to describe user-definable portions of the device, software and system of the invention and for convenience they are referred to as ‘rules’ as outlined on page 5 lines 20 – 24 of the current description. The Application explains further that “the rules are adapted to comprise data on at least one mathematical operator, at least one physical parameter and instructions on how the mathematical operator is applied on the physical parameter in order to yield the operation result.” We are told further that the rules may be in the form of a script whereby the wristop device interprets and runs the script. Further, the complexity of the rules, i.e. the number of mathematical operators or physical variables is not limited provided that the computing power of the microprocessor is suitably selected and the rule engine is suitably programmed. Thus the skilled person will realise that this part of claim 1 refers to interface means that allow the user to input a mathematical formula which includes at least one

² *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

mathematical operator (such as addition, multiplication etc.) and a physical variable in any form they wish.

- 16 Mr Wright also explained that during prosecution claim 1 has been narrowed to relate only to wristop computers and not other mobile devices. Moreover, all the features of claim 1 reside on the wristop computer itself apart from the physical sensors required to provide a physical variable which may reside elsewhere.
- 17 The examiner cited four pieces of prior art. These are WO02/067449 A2, US6556222 B1, US5197489 A and US 2005/0038332 A1. The first of these, WO '449 is the most relevant and was discussed in some detail at the hearing. I will consider it here.
- 18 WO '449 discloses a modular personal network (MPN) system comprising multiple individual network components (INCs), each with one or more primary functions that communicate using a wireless network. The MPN is small in size and the INCs may be worn or carried by the user. One INC may be a control unit containing a processor and memory for controlling other INCs in the MPN. Another of the INCs may function as a display to be worn on the wrist of the user. The MPN may monitor and control a physical workout of the user by collecting physical data such as distance, heart rate etc. and controlling a setting on a piece of exercise equipment.
- 19 The examiner referred in particular to Figure 58 of WO '449 and the related part of the description in the paragraph bridging pages 73 and 74. Figure 58 shows a screen that may be shown on an athlete's or coach's computer for defining a workout. A user may select a number of sections for the workout and the duration of a particular section. The user then selects the parameter to be selected during that section such as heart rate and also chooses the type of control such as 'linear' or a predefined 'curve' between two selected values. In the example in Figure 58, the user has chosen a linear increase in heart rate between 100 and 130 beats per minute. Finally the user selects how the parameter may be controlled i.e. by controlling the speed or the difficulty of the exercise. In Figure 60 and the description on pages 75 -77, a flow chart describes how after the workout has been defined as indicated above, physical data such as heart rate data is collected during the section of the workout session. The data may be presented to the user during exercise and used to control a setting of a piece of exercise equipment so that for example the heart rate of the user follows the prescribed function.
- 20 Ms Yang indicated a number of differences between the disclosure in WO '449 and that defined in claim 1. I agree that there are two significant differences. The first of these is that in WO'449 there are no interface means to allow user input to define a mathematical formula comprising at least one mathematical operator and at least one physical variable. In WO '449, the user selects a predefined curve such as 'linear' or 'curve' between two selected end points. They are not free to define the mathematical function itself. Also I agree that there is consequently no disclosure of an interpreter that is adapted to interpret such a flexibly-defined mathematical operation into instructions as also required by claim 1.
- 21 I therefore find claim 1 to be novel in light of WO '449.

- 22 The examiner found claim 1 to be not novel and therefore did not consider whether claim 1 involves an inventive step. At the hearing and in their skeleton arguments the Applicant's attorneys presented detailed arguments regarding inventive step following the established Windsurfing/Pozzoli steps defined above. I will follow this approach here.
- 23 Regarding steps 1(a) and 1(b), the notional person skilled in the art is defined in the Applicant's skeleton argument as "someone who works in the field of wristop computers and has knowledge of ways in which to provide user input means into said wristop computers". At the hearing Ms Yang expanded this to include "someone who has knowledge of working with activity monitors whether they be wristop or other means". I think both form a reasonable assessment of the skilled person.
- 24 Moving onto step 2, from the skeleton argument and comments at the hearing, the applicant defines the inventive concept of claim 1 to be a wristop computer that gives a user free-reign to input rules of their own choice, without having to choose from a list, in order to monitor their workout in a specific way. I agree with this assessment but also include the specific features of the invention which enable this result namely interface means to allow a user to input a mathematical formula comprising at least one mathematical operator and at least one physical variable, and corresponding interpreter means adapted to interpret such a flexibly-defined mathematical operation into microprocessor-readable instructions. Regarding step (3), these latter two requirements are the key differences between the matter disclosed in WO '449 and the inventive concept of claim 1.
- 25 Finally considering step (4), Mr Wright explained that the device in WO'449 is very different in both form and functionality to that of the invention of the application. I agree. The invention of the Application defines a wristop computer with all key components defined in or on the wristop computer itself apart from the physical sensors. Further, the invention defines a means of improving the adaptability of the device with regard to the information communicated to the user by allowing the user to input a mathematical function, the form of which is freely determined by the user. In contrast, WO '449 discloses a distributed network system with many connected components; the parameters of a workout may be defined by the user by allowing the user to select pre-defined parameters and functions. There is no suggestion in WO'449 of allowing the user to have more control over the type of function employed. In any case, as Ms Yang pointed out, it seems likely that the skilled person on reading WO '449 would be inclined to simply introduce more options for the user to choose from rather than developing a more flexible input system and the necessary interpreter software. These latter adaptations would require inventive ingenuity beyond the routine capabilities of the notional skilled person. Therefore I consider claim 1 to involve an inventive step in light of WO'449.
- 26 In light of these considerations, I find claim 1 to be both novel and involve an inventive step in light of document WO'449. Although not discussed here, I have reached a similar conclusion regarding the other three cited prior art documents.

Excluded matter – the law

- 27 The examiner raised an objection under section 1(2) of the Act stating that the invention is not patentable because it relates to excluded matter in particular a

computer program. The relevant provisions of this section of the Act are shown with added emphasis below:

1(2) It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of
(a) a discovery, scientific theory or mathematical method;
(b) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;
(c) a scheme, rule, or method for performing a mental act, playing a game or doing business, or a program for a computer;
(d) the presentation of information;
but the foregoing provisions shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such.

28 The provisions of section 1(2) were considered in *Aerotel*³ when a four-step test was set out to decide whether a claimed invention is patentable:

(1) Properly construe the claim;
(2) identify the actual contribution;
(3) ask whether it falls solely within the excluded subject matter;
(4) check whether the actual or alleged contribution is actually technical in nature.

29 It was stated by Jacob LJ in *Aerotel* that the test is a re-formulation of and is consistent with the previous “technical effect approach with rider” test established in previous UK case law. Kitchen LJ noted in *HTC/Apple*⁴ that the *Aerotel* test is followed in order to address whether the invention makes a technical contribution to the art, with the rider that novel or inventive purely excluded matter does not count as a “technical contribution”.

30 The Court of Appeal in *Symbian*⁵ ruled that the question of whether the invention makes a technical contribution has to be addressed when considering the computer program exclusion, although it doesn’t matter whether that takes place at step 3 or 4.

31 Lewison J in *AT&T/CVON*⁶ set out five signposts that he considered to be helpful when considering whether a computer program makes a technical contribution. Lewison LJ reconsidered the signposts in *HTC/Apple* in light of the decision in *Gemstar*⁷. The signposts are:

i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer

³ *Aerotel Ltd v Telco Holdings Ltd & Ors* Rev [2007] RP7

⁴ *HTC v Apple* [2013] EWCA Civ 451

⁵ *Symbian Ltd v Comptroller General of Patents* [2009] RPC 1

⁶ *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)

⁷ *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2010] RPC 10

ii) whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run

iii) whether the claimed technical effect results in the computer being made to operate in a new way

iv) whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer

v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented

Excluded matter - analysis

32 I will consider each of the Aerotel steps in turn.

Step (1): Properly construe the claim

33 I have construed the key features of claim 1 above. I consider claim 1 to define a wristop computer having a memory; a microprocessor for running software stored in the memory; hardware capable of providing a physical variable; interface means with flexibility to allow the user to input a mathematical formula of their choice including at least one mathematical operator and at least one physical variable; an interpreter to convert the mathematical formula into instructions where the software reads a value of the physical variable and performs the mathematical formula; communication means to communicate a result of the formula to the user.

Step (2): Identify the actual contribution

34 From *Aerotel* paragraph 43 the identification of the contribution involves looking at the substance rather than the form of the claimed invention. Further, this step should essentially be a matter of determining what it is the inventor has really added to human knowledge and this involves (quoting from Jacob LJ) “*an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are*”.

35 It is useful to consider these three factors in turn. From the Application, the problem which the invention seeks to address is how to improve the information content provided to a user of a wristop computer. Prior art devices may only have a few selectable options or rules determining how results are communicated to the user. Clearly, to simply include more options would need more memory and a more complicated user interface.

36 The invention of claim 1 deals with this problem by allowing the user to input a mathematical formula into the wristop computer in any form they like. The user is given the option of selecting different mathematical operators with different physical parameters and arranging them how they wish with various degrees of complexity. An interpreter is included in the software of the wristop computer which is able to convert the inputted mathematical formula into computer-readable instructions.

- 37 The Application asserts that a key advantage of the invention is that the information communicated to a user can be changed by the user after purchase. The user can therefore configure this aspect of the device themselves according to their own requirements. Mr Wright explained further that allowing the user to build their own equations and then converting the resulting rules into instructions with an interpreter requires less memory than selecting from a large number of rules, each of which would need to be stored along with their associated computer-readable instructions. Of course the interpreter itself will require memory. However, I am willing to concede that for very large numbers of possible formulae the invention of the Application provides a memory-efficient alternative.
- 38 The examiner found the contribution to be “a program for a wrist-mounted computer which allows a user to input a data structure of a mathematical formula and which then performs the mathematical operation described by the formula using a value of a physical quantity.” He also noted the advantage of improved functionality of the device with respect to the information content available to the user.
- 39 At the hearing Mr Wright emphasized the importance of the interpreter to the contribution and instead defined the contribution to be: “it allows a person to be able to define their own set of rules by which their workout can be analysed and processed by having user interface which allows a mathematical formula to be entered and by using an interpreter means which takes that mathematical formula and converts that into a form that the microprocessor can use in order to give you the result.” Mr Wright also noted that during prosecution, claim 1 and hence its contribution has been narrowed to “the narrow technical art of sports watches”.
- 40 From all of these considerations, I regard the contribution to be a wristop computer for monitoring sports-related activities with means for providing a physical variable, where a user can input a mathematical formula in a form of their choice that transforms the physical variable into a new result and interpreter means to convert the formula into microprocessor-readable instructions thus allowing the information content provided to the user to be configured by the user in a flexible and memory-efficient way.

Steps (3) & (4): As whether the contribution falls solely within the excluded subject matter; check whether the contribution is actually technical in nature

- 41 It is convenient when considering the computer program exclusion to deal with steps (3) and (4) together. In other words I must now decide whether the contribution is technical in nature or whether it falls solely within excluded subject matter. The examiner considered the five AT&T signposts listed above in turn and decided that the invention fails to meet any of them. He concluded based on his reasoning that claim 1 does not make a technical contribution and is merely a computer program as such.
- 42 I begin this section by noting that the contribution is certainly facilitated by computer programs or software. According to the Application this occurs in two ways. Firstly, the software run in the wristop computer comprises a programming mode in which the user may define new rules or modify existing rules by operating interface means such as buttons and display on the device. Secondly, the software of the device comprises a rule interpreter containing a command set capable of interpreting the

rules. However, what I must ask is what does the software actually contribute and does the contribution as a whole fall within the scope of the computer program exclusion.

- 43 The applicant's attorneys have forwarded two key arguments based around the third and fourth AT&T signposts. Firstly, regarding the third signpost, they submit that the wristop computer of the invention of the Application operates in a new way compared with wristop devices of the prior art. This is due they assert to interface means being adapted to enable input of a flexibly-defined formula and interpreter means being adapted to interpret the resulting data structure into microprocessor-readable instructions. Mr Wright emphasised in particular that "the interpreter is the technical means by which the invention can work". He added that just inputting mathematical formulae is not enough for the invention to work; you must take the additional step of adding an interpreter which is not required in the prior art.
- 44 Regarding the fourth signpost, the applicant's attorneys assert that the wristop computer of the Application is a *better* wristop computer. Mr Wright explained that the prior art devices have a number of pre-defined configurations each of which will be stored in machine-readable form within the memory. He went on to suggest that once you get up to maybe tens of thousands of different options the memory will need to be very big. Mr Wright explained further that larger memories are more expensive and consume more power than smaller ones. In particular he contends that the present invention reduces the amount of required memory by using an interpreter to interpret a flexibly-defined formula rather than storing a large number of previously-defined rules and their related instructions. Mr Luoto emphasized how important low power consumption is for an activity-monitoring device which may be used for example while exploring over a duration of a couple of weeks.
- 45 In response to these arguments, I agree with the examiner that the wristop computer of the Application does not work in a new way nor is it a better computer with regard to the fundamental workings or internal components of the computer. The interface and the interpreter rely on software that do not affect the actual running of the computer itself. I do, however, consider the wristop computer of the Application to operate in a new way compared with prior art devices in the sense that users now have greater flexibility in how they can monitor their exercise program. This requires interface facilities and interpreter software not needed and therefore not provided in the prior art devices.
- 46 As noted, the contribution is limited to the narrow field of wristop computers for monitoring sports-related activities. Such devices have particular problems related to their small size and intended use including the need to minimize memory and power consumption and also the need to provide compact but accessible input facilities through a small interface. Any adaptations made to the device to improve the user's experience must address these issues. Further the field of sports watches is a technical field in the sense that the wristop computer reads in physical data in the form of a measurable value obtained from a sensor either in or linked to the wristop device. In the invention, the user is able to transform this real data in a flexible way to improve how their exercise is monitored. The wristop computer of the invention achieves this flexibility in a memory-efficient way which is compatible with the structure and use of the device. For these reasons I consider the wristop computer of the invention to represent a better *wristop* computer with improved functionality.

These factors I believe provide a technical effect and take the contribution outside the excluded field of a computer program as such.

Conclusion

- 47 I have found the invention as currently claimed to both be novel and involve an inventive step in light of the four cited patent documents. I have also found that the invention does not relate to a computer program as such. I therefore remit the Application to the examiner for further processing. In particular amendments need to be made to the Application to ensure the description and dependent claims are in conformity with independent claim 1 in its current form.

P MASON

Deputy Director, acting for the Comptroller