Intellectual Property Office

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02 August 2024

PATENTS ACT 1977

APPLICANT	Human Mode LLC
ISSUE	Whether patent application GB2201295.9 complies with section 1(2) of the Patents Act 1977
HEARING OFFICER	Dr Stephen Brown

DECISION

Introduction

1 This decision relates to the issue of whether patent application GB2201295.9 ("the application") meets the requirements of section 1(2) of the Patents Act 1977 ("the Act").

2 The application is entitled "Authoring system for interactive virtual reality environments" and was published as GB2600850 A on 11 May 2022. It is the national phase of international patent application PCT/US2020/045344, which was published as WO2021/026422 A1 on 11 February 2021.

3 Through amendment and re-examination, the applicant has been able to provide a set of claims defining an invention that the examiner regards as novel and inventive over the cited prior art, however, there is no agreement on whether the claimed invention relates to a program for a computer as such and the presentation of information as such.

4 In an examination report of 7 February 2024, the examiner invited the applicant to request a hearing. The applicant responded with further arguments on 11 March 2024 but also requested a hearing in the event of the examiner's assessment remaining unchanged.

5 In a letter of 27 March 2024, the examiner explained that they weren't persuaded by the applicant's arguments and arranged for a hearing. The matter thus came before me for a video hearing on 14 May 2024. The applicant was represented by Dr Terence Broderick of Murgitroyd & Company.

6 A skeleton argument was submitted on 7 May 2024. A set of amended claims was also provided to address a clarity issue highlighted by the examiner in paragraphs 7 and 8 of their examination report of 7 February 2024. I am mindful that the amendments have not been considered by the examiner, however, they follow the examiner's interpretation of the claims and do not add subject matter. Furthermore,

given their nature, I do not consider the amendments to have any bearing on the assessment of the invention under section 1(2). Thus, I shall consider these amended claims, and they will be incorporated into the application if the invention is found to relate to patentable subject matter.

7 Under rule 30(2)(b) of the Patents Rules 2007 (as amended), the section 20 compliance period for putting the application in order ended on 31 March 2024. The compliance period has been extended twice under the provisions of rule 108 such that the compliance period now expires on 31 July 2024. Should it be necessary, the applicant can request a further discretionary extension of the period under rule 108(3). They can request this up to 30 September 2024.

The application

8 The application provides a way of creating and modifying a virtual reality ("VR") environment from within the VR environment.

9 VR environments, also referred to as virtual environments or VR applications, can include, for example, entertainment such as games and multimedia, or training such as classroom education or virtual training.

10 Programming VR environments is a complicated and time intensive process often requiring a team of individuals with a broad and advanced skillset including at least graphic art design, computer programming, understanding of three-dimensional math and physics, and audio engineering. The application proposes a less complicated process for establishing and running a VR environment by a user, who may not possess the skillset conventionally required for such an activity.

11 Figure 1 of the application, reproduced below, shows an embodiment of a virtual reality world authoring system ("authoring system") 10 according to the invention.

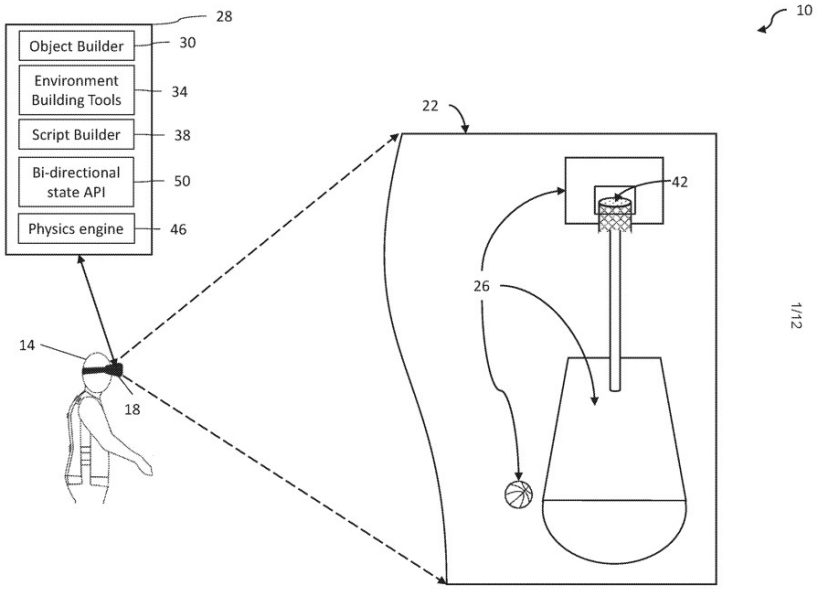


FIG. 1

12 In the authoring system 10, a user 14 uses a headset 18 to access a VR environment 22 containing objects 26. Very briefly, an object is a container of empty items, some of which may also be objects serving as a container for further items. Items that get added to or embedded within the container for an object may be, for example, a three-dimensional mesh representing the object, a texture for the object, an audio file associated with the object, and a script action. Together the items come together to define a virtual object, for example a basketball or a basketball net.

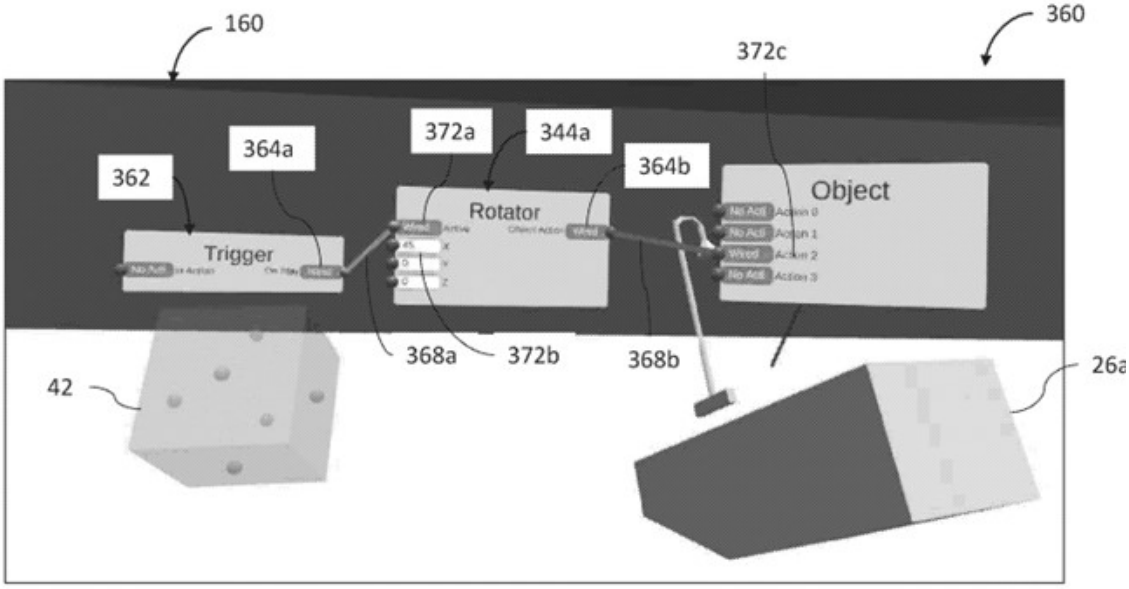
13 The environment 22 is established and run by a virtual environment generator component 28 available to the user 14. The user 14 is not a programmer and does not know programming language. Through the authoring system the user can build the environment 22 without writing computer code.

14 As described, the virtual environment generator component 28 provides “one or more computer applications having VR design features” including:

- an Object Builder 30 for creating objects 26 within a room 22;
- Environment Building Tools 34 offering a suite of tools for creating or modifying room settings;
- Script Builder 38 which enables the user to create interactive and complex objects within the environment 22 and to do so without needing to write programming code;
- Bi-directional state (API) allowing bi-directional state information from the real world into the virtual environment 22 and vice versa; and
- a Physics engine which is a module of computer code that simulates physical and mass interactions for objects 26 within the virtual environment 22.

15 The Script Build offers the user a series of scriptable functions. These are computer functions having at least one input and one output. Action scripts are modules of computer programmable code comprising one or more scriptable functions. The user can build complex objects by wiring together action modules without understanding a computer programming language.

16 Figure 12, reproduced below, illustrates how the Script Builder enables a script builder diagram to be created for a VR room 160 having a trigger object 42 and bathtub object 26a. Using a visible scriptable connector 368a, the user is able to link the output 364a of a ‘trigger scriptable action’ 362 to the input of a ‘rotator scriptable action’ 344a. A ‘static rotator scriptable action’ 372b is also used which defines a 45 degree rotation about the X-axis. The user is also able to connect the ‘rotator scriptable action’ to the bathtub object 26a. Hence, when the tigger object 42 calls on the rotator scriptable action 344a, the bathtub 26a is rotated according to the user defined parameters.



17 The most recent set of claims were filed on 29 December 2023. They comprise ten claims in total, with claims 1 and 6 being independent:

Claim 1

An electronic device comprising:
a processor;
a headset having a visual feedback screen;
one or more user interface devices; and
a non-transitory computer readable medium storing computer executable code that when executed by the processor cause the processor to:

project a virtual reality environment to the headset, the virtual reality environment having two or more objects, each of the two or more objects being created by a container having properties that define how the two or more objects interact within the virtual reality environment, the two or more objects having a three dimensional mesh with coordinates defining a boundary of the two or more objects, at least one of the two or more objects being a trigger object having a trigger scriptable action;

select a first object of the two or more objects;

provide a script builder diagram in the virtual reality environment, the script builder diagram including the trigger object with the trigger scriptable action having a trigger scriptable action output, a scriptable action having a scriptable action active input and a scriptable action object output, and the first object having an object input;

create a first action script by receiving, from the user, a direction to connect the trigger scriptable action output to the scriptable action by a first scriptable connector; and receiving, from the user, an indication to connect the scriptable action object output to the object input by a second scriptable connector;

wherein the first action script includes a module of computer executable code having one or more function, the one or more function configured to affect one or more property of the first object of the two or more objects within the virtual reality environment based on an

interaction with the trigger object within the virtual reality environment; and

update the container of the first object to include the first action script.

Claim 6

A non-transitory computer readable medium storing computer executable code that when executed by a processor cause the processor to:

project a virtual reality environment to a headset, the virtual reality environment having two or more objects, each of the two or more objects being created by a container having properties that define how the two or more objects interact within the virtual reality environment, the two or more objects having a three dimensional mesh with coordinates defining a boundary of the two or more objects, at least one of the two or more objects being a trigger object having a trigger scriptable action;

select a first object of the two or more objects;

provide a script builder diagram in the virtual reality environment, the script builder diagram including the trigger scriptable action having a trigger scriptable action output, a scriptable action having a scriptable action active input and a scriptable action object output, and the first object having an object input;

create a first action script by receiving, from the user without writing computer code, a direction to connect the trigger scriptable action output to the scriptable action by a first scriptable connector; and receiving, from the user without writing computer code, an indication to connect the scriptable action object output to the object input by a second scriptable connector;

wherein the first action script includes a module of computer executable code having one or more function, the one or more function configured to affect one or more property of a first object of the two or more objects within the virtual reality environment based on an interaction with the trigger object within the virtual reality environment; and

update the container of the first object to include the first action script.

The Law

18 Section 1(2) of the Act is as follows:

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

…

(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 provision 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.

19 The assessment of patentability under Section 1(2) is governed by the judgment of the Court of Appeal in *Aerotel*[1], as further interpreted by the Court of Appeal in *Symbian*[2]. In *Aerotel* the court reviewed the case law on the interpretation of Section 1(2) and set out a four-step test to decide whether a claimed invention is patentable:

> *(1) Properly construe the claim;*
> *(2) identify the actual or alleged 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*

20 At paragraph 43 of *Aerotel,* the Court summed up the exercise of identifying the contribution as:

> *"…an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form – which is surely what the legislator intended."*

21 The Court of Appeal in *Symbian* made it clear that the four-step test in *Aerotel* was not intended to be a new departure in domestic law; it was confirmed that the test is consistent with the previous requirement set out in case law that the invention must provide a 'technical contribution'. Paragraph 46 of *Aerotel* states that applying the fourth step of the test may not be necessary because the third step should have covered the question of whether the contribution is technical in nature. It was further confirmed in *Symbian* that the question of whether the invention makes a technical contribution can take place at step 3 or 4.

22 Lewison J (as he then was) in *AT&T/CVON*[3] set out five signposts that he considered to be helpful when considering whether a program for a computer makes a technical contribution. In *HTC/Apple*[4] the signposts were reformulated slightly in light of the decision in *Gemstar*[5]. The signposts are:

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

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[1] *Aerotel Ltd v Telco Holdings Ltd & Ors* Rev 1 [2007] RPC 7
[2] *Symbian Ltd v Comptroller General of Patents* [2009] RPC 1
[3] *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)
[4] *HTC v Apple* [2013] EWCA Civ 451
[5] *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2010] RPC 10

Application of the Aerotel test

Step (1): Properly construe the claim(s)

23 The first step is to consider the construction of the claims. Notwithstanding the minor clarity issues raised by the examiner - since addressed by the amendments submitted with the skeleton argument - the examiner construed the claims as written.

24 In their skeleton argument, and later confirmed by Mr Broderick at the hearing, the applicant is in general agreement with the examiner in respect of the first step of *Aerotel*.

25 Although parts of the claim require a careful read, I think the language used causes no real difficulty, however, I make the following observations.

26 Both claims have a requirement that the stored computer executable code which, when executed by the processor, cause the processor to 'select a first object of the two or more objects'. This could be read as meaning that each and every time the code is executed a first object is always selected, however, I believe the skilled person having the description in whole, and noting especially statement number 29 at paragraph 134, would understand this requirement as meaning the processor selects the first object in response to an input from one or more user interface devices.

27 In terms of the user interface devices featuring in claim 1, the description doesn't tell us what that the interface device(s) might be, however, paragraphs [003] and [0227] indicate that a user interface device is a device that allows a user to provide input to the virtual environment. To my mind this would include devices such as a keyboard, a handheld controller, gloves, or possibly the headset's own visual feedback screen.

28 The claims also require the creation of a script builder diagram in the VR environment, with 'the script builder diagram including the trigger object…, a scriptable action…, and the first object having an object input'. While there may be better ways to express the components included in the script builder diagram, and to perhaps better introduce the 'object input' of the first object, this part of the claim is sufficiently clear.

29 Each claim refers to a 'scriptable action object output'. Based on the description of other scriptable actions, the word "object" is arguably superfluous however, it doesn't obscure the claim. What's important is that the scriptable action has an output.

Step (2): Identify the actual or alleged contribution

30 The examiner identified the contribution of claims 1 and 6 as being:

> "…the provision of a user interface within a virtual environment, the interface comprising trigger objects and scriptable actions that can be used to create action scripts to define the behaviour of virtual objects within the virtual environment."

31 In a pre-hearing report dated 27 March 2024, the examiner added a final sentence to this contribution which reads:

> "The interface enables users to author virtual environments without writing program code."

32 In arriving at this contribution, the examiner discounted the hardware as being "entirely conventional". The examiner also considered the problem solved by the invention, namely that "authoring VR environments is complex and typically demands proficiency in writing program code". They also considered the advantages of the invention, namely that "the user can define the behaviour of virtual objects within a VR environment without having to write program code".

33 The applicant, however, does not agree with the contribution identified by the examiner. In their skeleton argument they argued that it is "an over-simplification as it ignores aspects which impart control over elements in a virtual environment". The skeleton goes on to say that "the Examiner's simplification of simply circumnavigating the need to code is a drastic oversimplification of the problem the person skilled in the art would face".

34 In their opinion the claimed invention enables a VR environment to be built without a high level of skill; it enables a VR environment to be to be configured in a simple way as the user does not need the usual technical skillset. At the hearing, Mr Broderick argued:

> "It's useful to point out that LJ Jacob in Aerotel said that when you assess contribution it is 'useful to consider what the invention does as a matter of practical reality'. This is in the Manual of Patent Practice as well. The claimed subject matter doesn't merely circumvent the need to code but rather enables VR environments to be configured in a simple way so that a user can interact with objects in the VR environment….This is the practical reality [of what the invention does]…the invention provides a way to enable a virtual reality environment to be set up in a simple way and it does that not through a principle of just getting rid of coding, it sets up containers and scripts to enable a user who probably wouldn't be able to set one of these up…, to set up a functioning virtual reality environment which can respond to users interacting with the objects…

35 To illustrate this Mr Broderick pointed me at paragraph 89 of the application where it talks about a door and a door press in a virtual reality environment and how the door would respond to the button press in said environment. The paragraph reads as follows:

> "[089] Action scripts are created by the script builder 38 and used to add interactivity to the virtual environment 22. By creating action scripts that include trigger scriptable actions, the user 14 is able to quickly and easily create complex objects within the virtual environment without programming knowledge. While the breadth and variety of uses for triggers is bound only by the user's imagination, some other examples of using triggers to create interactive complex objects include adding a trigger to a button trigger object such that when pressed, an elevator door opens…"

36 In keeping with this, in their skeleton, the applicant argued that the contribution made by the claimed invention is one of:

> "enabling the user to configure interactive and complex objects within the virtual environment"

37 At the hearing, Mr Broderick added that even if the examiner's statement of the contribution stands, the assessment under steps 3 & 4 of *Aerotel* would nevertheless result in a finding of patentability.

38 I note that there is no suggestion from the applicant, or from Mr Broderick at the hearing, that the hardware of claim 1 has a part to play, nor any hardware that might form part of claim 6. It is said by the examiner to be conventional hardware and I agree. The contribution therefore must lie within what is left, the executable code run by the processor and what it does.

39 I do not believe the contribution can be defined as broadly as the proposal in the applicant's skeleton argument; that proposal goes to the overall purpose of the invention but, in my opinion, it is pitched at too abstract a level, drawing out little of what it is about the claimed invention that actually enables a user to configure complex objects in the VR environment. Furthermore, this assessment does not seem to distinguish the invention from any other system, process, or code which allows someone to configure objects in a virtual reality environment, for example the arrangement disclosed in US2019/0004791A1 (UMAJIN), a novelty citation raised in the international preliminary report on patentability of 8 February 2022, and adopted by the examiner in their first examination report under section 18(3).

40 I am nonetheless mindful of Mr Broderick's submission in relation to what the invention does and the applicant's arguments in respect of the examiner's assessment of the contribution.

41 Broadly speaking, noting what is said at, for example, paragraphs [005] to [007] of the application, in terms of the advantages of the claimed invention, it enables a user to create and modify a complex interactive VR environment simply without requiring knowledge of program code, and to do so from within the VR environment itself. This avoids the problem of VR environments typically needing a skilled and technically knowledgeable person to design and configure the environment.

42 In terms of how the invention works and what it does, the claimed invention provides, among other things, a script building diagram within a VR environment. The diagram allows the user to build up the interactive behaviours of an object within the VR environment. The user interacts with the diagram to connect an output of a trigger scriptable action associated with the trigger object to an object input of the object. This is done via an intermediate scriptable action sitting between the trigger output and the object input. What results is an action script that includes a module of computer executable code having one or more scriptable functions, the scriptable function(s) configured to affect one or more properties of the object based on an interaction with the trigger object. The compiled action script is then included within a container for the object.

43 Noting the guidance provided in paragraph 43 of *Aerotel*, I believe the contribution here is best expressed as something of a blend of the examiner's version and the applicant's. Namely:

> "the provision of an interactive script building diagram within a virtual reality environment,
>
> the diagram providing a user, someone with no knowledge of program code or prior expertise in establishing a VR environment, the ability to build and configure the behaviour of an object in the VR environment, the behaviour being based on an interaction with an associated trigger object,
>
> the user interacting with the diagram to connect an output associated with the trigger object to a scriptable action, and to further link an output of the scriptable action to an object input of the object,
>
> the result being the creation of an action script which is included within a container for the first object, the action script including a module of computer executable code having one or more scriptable functions, the scriptable function(s) configured to affect one or more properties of the object based on an interaction someone or something has with the trigger object in the VR environment."

Steps (3) & (4): ask whether it falls solely within the excluded subject matter and whether the contribution is actually technical in nature

44 The third step of the Aerotel test involves considering whether the contribution falls solely within excluded categories. I shall begin by considering the computer programme exclusion. Clearly, the above contribution is, ultimately, a programme for a computer but the question is: is there an allowable technical contribution beyond being *just* a programme 'as such'?

45 Although I have reframed the contribution, the arguments submitted by the applicant in respect of the examiner's contribution are, I believe, still relevant due to the provision of action scripts.

46 In their skeleton the applicant argues that the examiner's contribution is not excluded because of the action scripts which are created to update the container of the first object (the final integer of claim 1). Those action scripts define the behaviour of objects within the VR environment and by enabling the creation of those action scripts, the claimed subject matter has an effect on the container which defines the behaviour of the object within the VR environment.

47 At the hearing Mr Broderick pointed out that the application does not actually define VR environments but does define virtual reality as a computer-generated simulation of a three-dimensional environment (paragraph [003] of the application). This can be interacted with by a person in a seemingly real, physical way, allowing the user to look around the artificial world, move around the environment and interact with objects. This interaction is key to the invention.

48 The entire point of a VR environment is to enable interaction between a user and the virtual objects in that environment. A user is outside of the computer and the interaction between the user and virtual objects is a technical process, especially where the response of the interaction is concerned.

49 Thus, the applicant argued that the contribution impacts the virtual reality environment, by enabling control of objects within the environment which are interacted with by a human user. This means that the contribution is providing an effect on a technical process outside of the computer as it providing an effect on how a user can interact with an object inside of the VR environment. In other words, the applicants argue that the contribution meets the first *AT&T*[4] signpost.

50 Further, the applicant argued that the features of the claimed device are set up to address the identified problem by defining containers and defining the creation of the scripts. It is not a circumvention of the problem but rather a positive and direct approach to solving a technical problem. Thus, they argue, the fifth *AT&T*[4] signpost is also met.

51 For completeness, the applicant accepted that the remaining three *AT&T*[4] signposts were not relevant to this application and I agree.

52 Turning to step 4 of *Aerotel*, the applicant argued that providing a method to affect objects within a VR environment provided an impact on the configuration of the respective VR environment. VR enables a user to interact with objects in a VR world. If you are effecting this environment then it is technical by its very nature. That is because to set up such an environment requires technical knowledge and skill. They can't be set up without such knowledge.

53 I will now address these arguments, in no particular order. Firstly, I am afraid that I do not agree with the applicant's submission that the contribution is inherently technical since it effects a VR environment. To my mind the contribution lies not in a method of creating or modifying the VR environment itself, nor does it lie in the end use of a VR environment as configured using the invention. Rather, the contribution lies in a virtual interface for modifying objects within the VR environment. Furthermore, I am unconvinced that VR environments are inherently technical, in the sense that section 1(2) requires. Ultimately, they are just clever software that fools users into thinking that they are interacting with a virtual world when in reality it is just a series of 2D images with perhaps some tactile and sonic feedback too.

54 Secondly, I am not convinced that there is an effect on a technical process outside of the computer. The only thing outside the computer is the user, the fact that they may interact differently with an object inside the VR environment is due entirely to changes within the computer, specifically within its software. I can see no external technical effect. Thus, I believe that the contribution fails the first *AT&T*[4] signpost.

55 Finally, the problem being solved is how to allow someone not skilled in computer coding to alter objects in a VR environment. While the contribution may well solve this problem, it is not a non-excluded technical problem as required by section 1(2). It is a problem of computer programming solved by using a virtual interface. Indeed, I do not believe it matters whether the user is creating or modifying the behaviour of objects from within the VR environment or is doing so outside in a conventional two-

dimensional interface. Either way, the interaction cannot be regarded as imparting the required technical effect. Thus, the contribution fails the fifth *AT&T*[4] signpost too.

56 Overall, I conclude that the contribution is excluded as no more than a programme for a computer as such.

Presentation of information

57 Having found that the contribution is excluded as a programme for a computer as such I will not consider this issue.

Conclusion

58 I have decided that the invention as defined in the independent claims falls solely within matter excluded under Section 1(2) as a program for a computer as such. Having reviewed the application, I do not consider that any saving amendments are possible. I therefore refuse the application under section 18(3).

Appeal

59 Any appeal must be lodged within 28 days after the date of this decision.

Dr Stephen Brown

Patent Examination Group Head