Commissioner's Decision # 1372

Décision du Commissaire # 1372

TOPIC: O00

SUJET: O00

Application No. : 2,554,498

Demande № : 2,554,498

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,554,498, having been rejected under subsection 30(3) of the *Patent Rules*, has subsequently been reviewed in accordance with paragraph 30(6)(c) of the *Patent Rules* by the Patent Appeal Board and by the Commissioner of Patents. The findings of the Board and the decision of the Commissioner follow:

Applicant

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INTRODUCTION

[1] This decision deals with a review of the Examiner's rejection in a Final Action of patent application no. 2,554,498 entitled "Body Motion Training and Qualification System and Method". The Applicant/inventor is M. Claude Choquet. The application relates to a device and method for use in training and qualification of a user performing a skill-related training exercise involving body motion in a workspace, in particular welding.

BACKGROUND

[2] The subject application is based on a PCT application, filed September 26, 2005. Therefore, the Canadian filing date is taken as September 26, 2005. The application is based on a Canadian priority application, no. 2,482,240, filed on September 27, 2004.

[3] The Examiner wrote a Final Action on November 10, 2011. At the time of the Final Action, the application contained 44 claims. In the Final Action, the Examiner identified all claims as failing to comply with section 28.2 and/or section 28.3 of the *Patent Act* for comprising subject matter that was either anticipated or would have been obvious on the claim date to a person skilled in the art.

[4] In a response to the Final Action, dated December 12, 2011, the Applicant replaced the claims on file with amended claims 1-46 (a clean copy of which was submitted February 3, 2012), and presented arguments for the novelty and non-obviousness of the amended claims.

[5] The Examiner did not consider that the amended claims rendered the application allowable. However, rather than forwarding the application to the Patent Appeal Board, the Examiner wrote a further report, dated June 4, 2012. This report was sent in error (as there is no authority for further examiner actions following the rejection of the application), and was subsequently cancelled on October 26, 2012. However, the

Applicant responded to the June 4, 2012 report on November 27, 2012, apparently unaware of its cancellation.

[6] The application was eventually forwarded to the Board in November, 2012. A panel was formed and the Applicant was advised in a letter dated August 2, 2013 that the claims on file, which are the subject of this review, are the clean copy of claims 1-46 submitted in Applicant's February 3, 2012 response to the Final Action.

[7] To the Panel's letter was attached a copy of a Summary of Reasons, in which the Examiner indicated that claims 1-46 were novel and claims 5, 23, 28 and 42 were non-obvious, but maintained that claims 1-4, 6-22, 24-27, 29-41 and 43-46 were obvious in view of the references cited in the Final Action.

[8] Also attached to the Panel's letter was a Supplemental Analysis, in which the Examiner reframed the obviousness analysis in the Summary of Reasons using the framework set out by the Supreme Court of Canada in *Sanofi-Synthelabo Canada Inc v Apotex Inc*, 2008 SCC 61 [*Sanofi*].

[9] A hearing was held by teleconference on November 15, 2013. Prior to the hearing, in a letter dated October 31, 2013 the Applicant provided a written submission in response to the Panel's letter, the Summary of Reasons and the Supplemental Analysis. In addition to arguments for the non-obviousness of claims 1-46 on file, the submission included a proposed set of claims, numbered 1-197. At the hearing the Panel explained to the Applicant that the Panel would consider the proposed claims only if the claims on file were found not to be allowable.

ISSUE

[10] The sole issue for determination is whether the subject matter of the claims on file (claims 1-46) would have been obvious to the skilled person on the claim date having regard to the cited prior art, in view of the common general knowledge, and therefore non-compliant with section 28.3 of the *Patent Act*.

CLAIMS IN DISPUTE: 1-46

[11] The claims on file include two independent claims: claim 1 is directed to a system, and claim 26 is a method claim. System claim 1 appears as follows:

> 1. A system for training and qualification of a user performing a skill-related training exercise involving body motion in a workspace, comprising:
>
> > an input device operable by the user in the workspace when performing the training exercise, the input device being such as to provide the user with a physical feeling of an object normally used to perform the training exercise, wherein the input device is a dummy welding torch;
> >
> > a detection device positioned non-invasively with respect to the workspace, for measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user during performance of the training exercise;
> >
> > a display device viewable by the user during performance of the training exercise;
> >
> > a computer apparatus connectable with the input device, the detection device and the display device, the computer apparatus having a memory with computer readable code embodied therein, for execution by the computer apparatus for:
> >
> > > selecting a training environment related to the training exercise to be performed from a training database;
> > >
> > > adjusting variables, parameters and controls of the training environment and training exercise;

monitoring use of the input device by the user;
monitoring the 3D angles and spatial coordinates measured by the detection device and computing an organ of vision-object relation as a function thereof;

computing a simulated 3D dynamic environment in real time as a function of the training environment selected, the simulated 3D dynamic environment reflecting effects caused by actions performed by the user on objects in the simulated 3D dynamic environment as monitored from the input device and the detection device;

generating images of the simulated 3D dynamic environment in real time on the display device as a function of the organ of vision-object relation;

recording data indicative of the actions performed by the user and the effects of the actions; and

setting user qualification as a function of the recorded data.

wherein setting user qualification comprises comparing the recorded data to a welding standard or code and granting certification if the recorded data meets or exceeds the acceptance criteria of the welding standard or code.

[12] Claim 26 defines a method to be carried out using the system generally similar to that defined by claim 1. Method claim 26 appears as follows:

26. A computer-implemented method for training and qualification of a user performing a skill-related training exercise involving body motion in a workspace, comprising:

selecting a training environment related to the training exercise to be performed from a training database;

adjusting variables, parameters and controls of the training environment and training exercise;

monitoring use of an input device providing the user with a physical feeling of an object normally used to perform the training exercise, wherein the input device is a dummy welding torch;

measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user during performance of the training exercise;

computing an organ of vision-object relation as a function of the 3D angles and spatial coordinates;

computing a simulated 3D dynamic environment in real time as a function of the training environment selected, the simulated 3D dynamic environment reflecting effects caused by actions performed by the user on objects in the simulated 3D dynamic environment as tracked from the input device and the 3D angles and spatial coordinates;

generating images of the simulated 3D dynamic environment in real time on a display device viewable by the user during performance of the training exercise as a function of the organ of vision-object relation;

recording data indicative of the actions performed by the user and the effects of the actions; and

setting user qualification as a function of the recorded data.

wherein setting user qualification comprises comparing the recorded data to a welding standard or code and granting certification if the recorded data meets or exceeds the acceptance criteria of the welding standard or code."

[13] Dependent claims 2-25 and 27-46 add further technical features, refinements and method steps to the broad embodiments set forth in the independent claims.

Purposive construction

[14] Purposive construction is an interpretive exercise done from the perspective of the skilled person in order to determine the meaning and scope of the claims. We construed the claims at the outset. However, since the sole issue for determination relates to obviousness and, as will be seen, the critical issue relates to the differences over the prior art, the construction of only those terms central to our conclusions on obviousness will be

provided. To facilitate reading, this will be done, as appropriate, within our analysis.

[15] At this stage we will simply clarify the meaning of certain terms used in the claims.

[16] In the expression "detection device positioned non-invasively with respect to the workspace", the term "non-invasively" means that the detection device does not interfere with the body motion and the vision of the user during the training exercise (page 7 of the description) and the term "workspace" represents the space in which a training exercise is performed (page 6 of the description).

[17] In the expression "measuring/monitoring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user", the angles and spatial coordinates are understood as being three-dimensional (X, Y and Z axes) and the term "organ of vision" represents something that is used to see objects in the workspace, and which defines a viewpoint. It may be but is not limited to the eyes of a user, his/her head, a display device or other accessory such as a helmet through which or by which a user may see the objects in a workspace (page 7 of the description).

OBVIOUSNESS: THE LAW

[18] Section 28.3 of the *Patent Act* sets out the information to be considered in determining whether the subject matter of a claim is obvious:

> 28.3 The subject-matter defined by a claim in an application for a patent in Canada must be subject-matter that would not have been obvious on the claim date to a person skilled in the art or science to which it pertains, having regard to
>
> (a) information disclosed more than one year before the filing date by the applicant, or by a person who obtained knowledge, directly or indirectly, from the applicant in such a manner that the information became available to the public in Canada or elsewhere; and

> (b) information disclosed before the claim date by a person not mentioned in paragraph (a) in such a manner that the information became available to the public in Canada or elsewhere.

[19] In *Sanofi*, the Supreme Court of Canada stated that it is useful in an obviousness inquiry to follow the following four-step approach:

> (1) (a) Identify the notional "person skilled in the art";
> (b) Identify the relevant common general knowledge of that person;
>
> (2) Identify the inventive concept of the claim in question or if that cannot readily be 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 which would have been obvious to the person skilled in the art or do they require any degree of invention?

[20] Regarding the meaning of "obvious", in *Sanofi, supra*, at para 64, Rothstein J quoted Sachs LJ in *General Tire & Rubber Co v Firestone Tyre & Rubber Co*, [1972] RPC 457 at 497:

> "Obvious" is, after all, a much-used word and it does not seem to us that there is any need to go beyond the primary dictionary meaning of "very plain".

OBVIOUSNESS: ANALYSIS

[21] In performing an obviousness analysis in accordance with the *Sanofi* framework, it is understood that the exercise should normally be carried out for each claim at issue: claims 1-46. We will commence with an analysis of the broadest independent claims in dispute, namely, system claim 1 and method claim 26. Since, as will be seen, these claims

are found to be unobvious, it is unnecessary to consider the narrower independent claims and the dependent claims.

(1)(a) The person skilled in the art

[22] While the Examiner identified the relevant knowledge of the person skilled in the art, he did not actually identify this person. In the Applicant's written submissions, and at the hearing, the skilled person was characterized as "a trained technician capable of setting up and maintaining systems for training and qualification of a user performing skill-related training exercises." While we generally agree with this characterization, we would add that the person would be skilled in computer-based training and qualification systems.

(1)(b) The relevant common general knowledge

[23] In the Supplemental Analysis, the Examiner stated that the person skilled in the art would be aware of welding standards and codes, required for training and certification. In the Applicant's written submissions, he generally agreed that the trained technician would have knowledge of training systems. However, the Applicant argued that this person would not be aware of skills pertaining particularly to the welding art, nor applicable welding standards and codes for training and certification. Moreover, the Applicant submitted that the knowledge of the trained technician would be limited to existing or previously used skill-training systems involving body motion in a work space.

[24] While we agree with most of the Applicant's identification of the common general knowledge of the skilled person, we consider that this person would at least be aware that there are standards and codes associated with various manual skills in industry, including welding, and would be able to readily locate the relevant standards and codes for that skill. Further, as noted above in our identification of the skilled person, such person

would have knowledge of computer-based training and qualification systems.

(2) The inventive concept of the claims

[25] In the Related Art (background) section of the description (pages 1-2), a number of examples of prior art systems and methods related to virtual reality simulators are provided. The description then describes several problems associated with the prior art, including that: they provide force feedback; they impose training limits due to confined space; they fail to address the position of the head of the user during the training process; they do not realistically reproduce defects resulting from poor performance; and they do not satisfy the need for both training and qualification.

Claim 1

[26] The solution proposed by the Applicant to these problems is a combination of features, which are recited in claim 1. In the Applicant's written submissions, the inventive concept of the claim (the Applicant referred to claim 87 of the proposed claims, which corresponds to claim 1 of the claims on file) is characterized as a system for training and qualification of a user performing a skill-related training exercise involving body motion in a workspace, the system including a combination of:

- an input device being a dummy welding torch operable by the user;
- a detection device that is positioned non-invasively with respect to the workspace;
- said non-invasive detection device being adapted for measuring 3D angles and spatial coordinates of reference points of the dummy welding torch and of an organ of vision of the user during performance of the training exercise; and
- a computer apparatus for recording data measured by the non-invasive detection device and of comparing the recorded data to a welding standard or code and granting certification.

[27] Having considered the problems the Applicant wished to address by his invention, and the solution as disclosed in the specification, we generally agree with this characterization of the inventive concept, with the exception that we do not consider it essential that the invention relates to welding in particular. Although the Applicant's claims are set in the environment of welding, the result achieved by the Applicant's invention would appear to lend itself to training and testing other types of manual skills. We therefore conclude that substituting the welding torch with a different input device, and the welding standard with a standard relating to the different input device, would have no material effect on the working of the invention.

Claim 26

[28] In the Supplemental Analysis, the Examiner defines the inventive concept of the claims in terms of both a system and a method utilizing that system. In the written submissions dated October 31, 2013, the Applicant similarly does not differentiate between the inventive concepts of system claim 1 and method claim 26.

[29] However, after reviewing the claimed method, and having considered the problems the Applicant wished to address by his invention, we find that the following steps are included in the inventive concept of claim 26:

- monitoring use of an input device;
- measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user during performance of the exercise;
- computing an organ of vision object relation as a function of the 3D angles and spatial coordinates;
- computing a simulated 3D dynamic environment in real time;
- generating images of the simulated 3D dynamic environment in real time on a

display device viewable by the user during performance of the training exercise;

- recording data indicative of the actions performed by the user and the effects of the actions; and
- setting user qualification as a function of the recorded data by comparing the recorded data to a standard or code and granting certification if the recorded data meets or exceeds the acceptance criteria of the standard or code.

[30] Further, although method claim 26 does not explicitly refer to all the features of the inventive concept of system claim 1, it is apparent from the steps recited in method claim 26 that it is carried out using the system of claim 1, and thus the claims are directed to the same general inventive concept. In particular, it is implicit from the claimed feature of measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user that the method requires a set-up according to the system of claim 1: a detection device adapted for measuring such angles and coordinates, and positioned separately from the input device and from an organ of vision of the user, such that it interferes with neither the body motion nor the organ of vision.

[31] Accordingly, the inventive concept of claim 26 is a method including the above-noted steps and carried out using the system of claim 1.

(3) Differences between the "state of the art" and the inventive concept

[32] In the Final Action, Summary of Reasons and Supplemental Analysis, the following references were cited:

Patents

D1: US 5,320,538	issued 14 June 1994 Baum
D5: US 4,867,685	issued 19 Sept 1989

D1: The Baum patent

[33] Baum discloses a system for training of a user performing a skill-related training exercise involving body motion in a workspace, comprising, *inter alia* :

- an input device operable by the user;
- tactile gloves to be worn on the hands of the user;
- headgear to be worn on the head the user;
- a stereoscopic visor to be worn by the user;
- a detection device comprising sensors positioned on the input device, on the tactile gloves and on the headgear, for tracking movements of the input device, the hands of the user and the head of the user; and
    - a computer apparatus for recording data measured by the detection device, computing a simulated 2D dynamic environment in real time, and generating a simulated 2D dynamic environment in real time, viewable by the user during performance of the training exercise, which environment appears to the user wearing the stereoscopic visor as a 3D environment.

D5: The Brush patent

[34] Brush discloses a similar system for training a user performing a skill-related training, but further teaches qualification (col 9, line 33). In Brush the input device is a dummy welding torch (abstract), and the sensors are located on the torch.

Differences between the state of the art and the inventive concept of ...

... Claim 1

[35] In the Supplemental Analysis the Examiner states that Baum discloses all the features of the claims except for: a dummy welding torch used as the input device; and the comparison of recorded data to a welding standard or code. Regarding the first of these two differences, the Examiner further states that Brush discloses a system for training and qualification of a user performing a skill-related training wherein the input device is a dummy welding torch.

[36] In the written submissions dated October 31, 2013, the Applicant disagreed with the Examiner's view of the prior art, and argued that there are several differences, as follows:

i neither Baum nor Brush teaches a detection device for measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user;

ii Baum fails to disclose an input device comprising a dummy welding torch;

iii the prior art fails to teach a detection device that is positioned non-invasively with respect to the workspace; and

iv neither Baum nor Brush discloses comparing the recorded data to a welding standard or code.

[37] Regarding the first noted difference, measuring 3D angles, the Applicant argues that neither Baum nor Brush specifically teaches this feature. While the Examiner argued that this feature was taught by Baum at col 5, lines 43-54 and col 5, lines 5-10, we have reviewed Baum, including the cited excerpts, and we consider that while they describe generally "tracking head movement" and tracking "general movements of the individual's hand relative to a defined object in the environment", the disclosure of Baum says nothing specific about the claimed feature of a detection device for measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user, and thus this feature represents a difference over the state of

the art.

[38] As for the second alleged difference, while the feature of a dummy welding torch is not taught by Baum, we note that such a device is disclosed in Brush's training system, and thus, aside from our finding that the specific nature of the input device is non-essential, we do not consider this as a difference over the state of the art.

[39] Concerning the third alleged difference, the Applicant argues that in Brush the detection device, which is located on the torch, is invasive of the workspace [see Brush, column 6, line 7 to column 7, line 25]. At the hearing, the Applicant further argued that in Baum's system the detection devices (sensors) are located on the gloves, which are invasive of the workspace. After reviewing the Baum reference, we note that unlike the claimed system, which utilizes a detecting device that is non-invasive of the workspace, Baum requires three distinct locations for the detecting means: one positioned on the user's head for tracking movement of the head; one positioned on the tactile gloves for tracking movements of the hand; and one positioned on the dummy tool to be grasped by the user for tracking movement of the tool. As it is apparent that each of these detecting means is invasive of the workspace, we conclude that this feature comprises a difference over the state of the art.

[40] In regard to the fourth noted difference, the Examiner did not contest the Applicant's view that the cited references fail to disclose comparing the recorded data to a standard or code, and the Panel, having reviewed the two cited references, agrees that this is a difference over the state of the art.

[41] As we noted earlier in describing the Baum patent, there is another potential difference in that while both the claimed invention and the invention taught by Baum include computing and generating images in real time on a display device viewable by the user during performance of the training exercise, it appears that this aspect of the system is

achieved in different ways. In the claimed invention this is described as computing and generating a simulated 3D dynamic environment, whereas Baum teaches that the images are generated in 2D, but appear to a user wearing a stereoscopic visor as 3D images.

[42] In view of the foregoing, we find that the differences between the state of the art and the inventive concept of claim 1 are as follows:

i) the claimed invention includes a detection device adapted to measure 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user;

iii) the claimed detection device is positioned non-invasively with respect to the workspace;

iv) in the claimed system the recorded data is compared to a standard or code; and

v) in the claimed system a simulated 3D dynamic environment is computed and generated.

... *Claim 26*

[43] The Supplemental Analysis draws no distinction between the differences between the state of the art and claim 26 and the differences argued between the state of the art and claim 1.

[44] In the written submissions, the Applicant similarly makes no distinction between the differences between the state of the art and claim 26 and the differences argued between the state of the art and claim 1.

[45] However, after making a comparison of the claimed method to the methods of Baum and Brush, we find that the differences include, using the system of claim 1, the steps of:

- measuring 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user during performance of the exercise;
- computing an organ of vision object relation as a function of the 3D angles and spatial coordinates;
- computing a simulated 3D dynamic environment in real time;
- generating images of the simulated 3D dynamic environment in real time on a display device viewable by the user during performance of the training exercise;
- comparing the recorded data to a standard or code.

(4) Do the differences constitute steps that would have been obvious?

Claim 1

[46] Of the differences set out in para [42], adapting the computer to compare the recorded data to a standard or code would not have required inventive ingenuity. It was known, for example from Brush, to include certification testing in the training module [see Brush, column 9, lines 33-36]. It would also be expected skill to compare the recorded data to a standard or code pertaining to the particular skill being practiced and tested, so that in the case where the particular skill is welding, it would be obvious to compare the recorded data to a welding standard or code.

[47] However, positioning the detection device non-invasively with respect to the workspace would not have been an obvious step for the skilled person. This arrangement, which provides the advantage of allowing both the input device and the organ of vision to be monitored simultaneously without interference from the surroundings, enhancing the real-time aspect of the generation of images, is neither taught nor suggested by Baum and Brush, considered separately or in combination.

[48] Further, adapting the detection device to measure 3D angles and spatial coordinates of reference points relative to the input device and an organ of vision of the user would not have been an obvious step. This adaptation involved moving from the prior art detection system (Baum discloses a detection system that utilizes sensors in the glove and on the input device, while Brush discloses a detection system involving a light pen and mercury switches located on the input device), to a system utilizing a detection device located so as to obtain data concerning the positions of the input device and the organ of vision of the user within a workspace without, as noted above, being invasive of the workspace. The combination of 3D location angle and XYZ coordinate data are reference points required for positioning purposes. This adaptation is not disclosed by Baum and Brush, either separately or in combination.

[49] Accordingly, claim 1 would not have been obvious to the skilled person on the claim date in view of Baum and Brush.

Claim 26

[50] As stated earlier, from a reading of method claim 26 we find that the recited steps are necessarily carried out using the system of claim 1. Therefore, for at least the reasons provided above with respect to claim 1, claim 26 would not have been obvious to the skilled person on the claim date in view of Baum and Brush.

Dependent claims 2-25 and 27-46

[51] Dependent claims 2-25 depend on independent claim 1 and dependent claims 27-46 depend on independent claim 26. Because claims 1 and 26 have been found to be non-obvious, it follows that dependent claims 2-25 and 27 to 46 are also non-obvious.

OBVIOUSNESS: SUMMARY

[52] For the foregoing reasons, we conclude that claims 1-46 would not have been obvious to the skilled worker on the claim date in view of the cited references and common general knowledge, and are thus compliant with section 28.3 of the *Patent Act*.

OTHER NOTED CLAIM INFORMALITIES

[53] In the Supplemental Analysis the Examiner noted several defects regarding indefiniteness of the claims, resulting in non-compliance with subsection 27(4) of the *Patent Act*, as follows:

- Claim 1 includes a period after the word "data" and before the last newly added paragraph.
- Claim 2 recites that the input device comprises one of a glove and a suit. This contradicts claim 1 (upon which claim 2 depends), which recites that the input device is a dummy welding torch.
- Claim 26 finishes with a quotation mark (and, we add, a period after the word "data" and before the last newly added paragraph).

[54] We find that these claims are defective on the grounds indicated, and that amendment of the claims is required. Instructions for amendment of the claims are provided in the following section.

[55] As the claims on file have been found, with only minor changes necessary, to be allowable, we need not consider the proposed set of claims furnished by the Applicant in the written submissions.

RECOMMENDATIONS OF THE PANEL

[56] In view of the above findings, the Panel recommends to the Commissioner that he:

(1) inform the Applicant, in accordance with paragraph 31(b) of the *Patent Rules*, that the following amendments to the claims on file are necessary for compliance with the *Patent Act* and *Patent Rules*:

a) in claims 1 and 26, deletion of the period after the word “data” and before the word “wherein”;
b) deletion of currently pending claim 2, and adjustment of claim numbering and dependencies of the remaining claims accordingly; and
c) in claim 26, deletion of the quotation mark at the end of the claim.

(2) invite the Applicant to make the above amendments within three months from the date of the Commissioner's decision; and

(3) advise the Applicant that:
a) if the above amendments and only the above amendments are made within the specified time, the Commissioner will consider the outstanding issues to have been addressed, and the application will proceed to allowance, and
b) if the above amendments and only the above amendments are not made within the specified time, the Commissioner intends to refuse the application.

Paul Fitzner

Paul Sabharwal

Andrew Strong

Member

Member

Member

DECISION OF THE COMMISSIONER

[57] I concur with the findings and recommendation of the Board. In accordance with subsection 30(6.3) of the *Patent Rules*, I hereby notify the Applicant that the amendments specified in paragraph [58] must be made within three (**3**) months of the date of this decision, failing which I intend to refuse the application. In accordance with paragraph 31(*b*) of the *Patent Rules*, these amendments, and only these amendments, may be made to the application.

Sylvain Laporte
Commissioner of Patents

Dated at Gatineau, Quebec,
this 19th day of September, 2014