Intellectual Property Appellate Board
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OA/40/2015/PT/KOL
TUESDAY, THIS THE 25th DAY OF AUGUST, 2020

HON'BLE SHRI JUSTICE MANMOHAN SINGH **CHAIRMAN**
HON'BLE DR. ONKAR NATH SINGH **TECHNICAL MEMBER (PVPAT)**

1. **HEALTH PROTECTION AGENCY.**
PORTON DOWN, SALISBURY,
WILTSHIRE SP4 0JG, UNITED KINGDOM

…APPLICANT/APPELLANT
(Represented by: M/S. D.P. AHUJA & CO.)

Versus

1. **THE CONTROLLER GENERAL OF PATENTS & DESIGNS**
BHOUDHIK SAMPADA BHAVAN,
ANTOP HILL, S.M. ROAD, MUMBAI – 400 037

2. **THE ASSISTANT CONTROLLER OF PATENTS & DESIGNS**
INTELLECTUAL PROPERTY OFFICE BUILDING,
CP-2 SECTOR V, SALT LAKE CITY,
KOLKATA-700091

…RESPONDENT

(Represented by – None)

ORDER

HON'BLE SHRI JUSTICE MANMOHAN SINGH, CHAIRMAN

1. The present Appeal is filed under Section 117-A of the Indian Patents Act, 1970, as amended by the Patents (Amendment) Act, 2005, from the decision and order dated 19 MARCH 2015 of passed by (Respondent Number 2), under Section 15 of the Indian Patents Act rejecting the patents application no. 3014/KOLNP/2006.

2. **Facts of the case :**

HEALTH PROTECTION AGENCY, the Appellant/Petitioner filed an application for patent being application number **3014/KOLNP/2006** on **18 OCTOBER 2006** as a national phase entry of the International (PCT) application no. PCT/GB2005/001056 filed on March 22, 2005.

The said application was originally filed with 83 claims of the PCT application as originally published. A copy of the Application for Patent (Form 1) with Complete Specification including claims and abstract, as filed for this application, are attached. **[Exhibit A2]**.

The First Examination Report (FER) on the said patent application was issued by the Patent Office communication dated July 14, 2010, under signature of Mr. Soumen Ghosh, the Assistant

Controller of Patents & Designs (Respondent Number 2)

2.1 The following substantive and formal objections were raised in the FER :

Objection 1. Claim 1 and 18 are not clear in respect of the expression "a biological agent", "validating treatment process" and "biological process indicator".

Objections 2. Subject matter of claims 1-17 are use claims which do not constitute an invention under Section 2(1)(j) of the Act.

Objection 3. Claims 18-30 do not sufficiently define the invention.

Objection 4. The title of the application and that of the specification is not precise.

Objection 5. Subject matter of claims lack inventive step in view of documents WO 2004003226 (D1), WO 0046357 (D2),US 4584272 (D3), Michel P.E. et al.(1998) Analytica Chemica Acta, vol 360, No. 1-3.89-99 (D4) and Aflalo C. et al. (1987) Biochemistry, Vol-26 No. 13, 3913-3920 (D5)

Objection 6. Claims 38-83 attract Section 3(i) of the Act.

Objection 7. Claims lack novelty in view of D1 and D2.

Objections 8-14. The Applicant was also asked to comply with various formal requirements including requirements under Section 8 of the Act

2.2 The Appellant filed a complete response to the FER through communication dated January 11, 2011 of the Appellant's Indian patent agent addressing all substantive objections and formal requirements of the FER with a set of amended claims 1-51, while deleting previous claims 1, 3-5, 13-16, 49-51, 54-56, 58-59, 61-62, 64-68, 69-70 and 75-76.. Copies of the Appellant/Applicant's response dated 11 January 2011 to the FER dated July 14 2010 with amended claims, fresh Application Form, fresh Form 2 and fresh Abstract filed.

The Appellant's agent received a hearing Notice through Patent office communication dated 17 July 2012 , in which only the substantive objections under Sections 3(i) and 3(c) of the Act, of the FER were maintained fixing a hearing before the Assistant Controller of Patents & Designs, (Respondent Number 2) on 24 August 2012.

3. As per appellant the following objections were raised or maintained in the said Hearing Notice dated 17 July 2012 by the Assistant Controller of Patents & Designs (Respondent Number 2):

(i) Claims 19-51 fall within the scope of such clause (i) of Section 3 of the Act.
Claims number 1-11 fall within the scope of such clause (c) of Section 3 of the Act as the claimed biological process indicator are nothing but known protein molecules embedded in solid matrix support and therefore, can be considered as naturally occurring known substance.

(ii) The title of the application and that of the specification is not precise.

(iii) Drawings should be refiled under Rule 15(6).

(iv) Fees for Form 2 and necessary petition should be paid for later inclusion of Form 2.

4. The hearing was attended by the authorised agent of the Applicant before the Assistant Controller of Patents & Designs, (Respondent Number 2) in rebuttal of the objections under Sections 3(i) and 3(c) of the Act, besides addressing the objections in respect of Form 2, title

of the application and specification and formal drawings as per the case of appellant.

5. It is stated on behalf of appellant that "Written Note of Arguments" was submitted to the Assistant Controller of Patents & Designs (Respondent Number 2) on 24 September 2012, pursuant to the said hearing in support of the Appellant's contention that the claims as amended do not attract Sections 3(i) and 3(c) of the Act and for allowability of the application on the basis of the claims 1-50 so amended. Corresponding amendment also made in the title of the invention.

However, the resoondent No. 2 refused the Application by the Assistant Controller of Patents & Designs (Respondent Number 2) on 19 March 2015 with Patent Office communication dated 20 March 2015 to the Appellants' agent **[Exhibit A1]**. An officially certified copy whereof, as required, is also submitted with this appeal.

6. The respondent No. 2 refused the instant application based on the following grounds as mentioned in paragraphs four and five of said decision.

(a) Amended claims 1-10 drawn to biological process indicator and kit claims 11-17 lack novelty and inventive step over D1-D5 earlier cited in the FER.

(b) Amended claims 1-10 not patentable under section 3(c) and section 3(d) of the Act.

(c) In vitro method claims 18-50 are not supported by description

(d) Amended claims 1-50 indirectly attract section 3(i) of the Act.

7. It is stated that apart from the objection against novelty and inventive step of claims over documents D1 to D5 cited in the FER which was apparently waived in the hearing notice based on Applicant's response to FER, and revived once again in the decision, the objections under section 3(d) of the Act and lack of descriptive support for method claims are raised for the first time in the decision of respondent No. 2 denying the Applicants an opportunity to traverse them or overcome them through amendment in contravention of the statutory provision of Sections 14 and 15 of the Indian Patents Act, 1970.

7.1 Claims as amended at the said hearing held on August 24 2012 based on which the decision to refuse the Application has been given by the Assistant Controller of Patents & Designs (Respondent No. 2) are listed below:

[1] A biological process indicator for validating a treatment process for reducing the amount or activity of a contaminating biological agent in a sample, comprising:

(a) a thermostable kinase that retains at least 95% activity after exposure to 70°C for 30 minutes, wherein the kinase is a trimeric adenylate kinase or a monomeric adenylate kinase; and

(b) a solid support selected from the group consisting of:

(i) an indicator strip, a dip stick or a bead, wherein the kinase is immobilised inside the solid support, or is covalently coupled onto the solid support; or

(ii) a matrix, wherein the kinase is dispersed within the said matrix.

[2] A biological process indicator as claimed in Claim 1, wherein the thermostable kinase retains at least 95% activity after exposure to 80°C for 10 minutes.

[3] A biological process indicator as claimed in Claim 1, wherein the kinase is a trimeric adenylate kinase from a *Sulfolobus sp.* or a monomeric adenylate kinase from a *Thermotoga sp.*

[4] A biological process indicator as claimed in Claim 1, wherein the kinase is an adenylate

kinase from *A. acidocaldarius*, *A. fulgidus*, *A. pernix*, *A. pyrophilus*, *B. caldotenax* BT1, *Bacillus species* PS3, *B. stearothermophilus* 11057, *B. stearothermophilus* 12001, *B. thermocatenulatus*, *C. stercocorarium*, *Methanococcus spp.*, *M. ruber*, *P. abyssi, P. furiosus, P. horikoshii, P. woesii,* R. *marinus, S. acidocaldarius, S. shibatae, S. solfataricus, T. ethanolicus*, *T. thermosulfurogenes*, *T. celere*, *T. litoralis, T. aquaticus* YT1, *T. caldophilus* GK24, *T. thermophilus* HB8*, T. maritima or T. neapolitana*.

[5] A biological process indicator as claimed in Claim 4, wherein the kinase is a *T. litoralis* kinase*, T. maritima* kinase, or a *T. neapolitana* kinase.

[6] A biological process indicator comprising a thermostable kinase amino acid sequence selected from SEQ ID NOs: 17-19.

[7] A biological process indicator as claimed in any of Claims 1-6, further comprising an agent to stabilise the kinase.

[8] A biological process indicator as claimed in Claim 7, wherein the stabilising agent is selected from metal ions, sugars, sugar alcohols and gel-forming agents.

[9] A biological process indicator as claimed in any of Claims 1-8, further comprising means to attach the indicator to a surface.

[10] A biological process indicator as claimed in Claim 9, comprising a projection, recess or aperture for attachment of the indicator to a surface by means of a screw, nut and bolt or clamp.

[11] A kit for use in validating a treatment process for reducing the amount or activity of a biological agent in a sample comprising:

(i) a biological process indicator as claimed in any of Claims 1-10, and

(ii) a substrate for the kinase;

wherein the biological agent is selected from the group consisting of bacteria, viruses, spores, proteins, and prions.

[12] A kit as claimed in Claim 11, further comprising means for detecting ATP.

[13] A kit as claimed in Claim 12, further comprising luciferin/luciferase.

[14] A kit as claimed in any of Claims 11-13, further comprising a luminometer.

[15] A kit as claimed in any of Claims 11-14, further comprising a look-up table correlating the kinase activity of the indicator with the reduction in the amount or activity of the biological agent.

[16] A kit as claimed in any of Claims 11-15, for monitoring TSE inactivation.

[17] A portable kit as claimed in any of Claims 11-16.

[18] An *in vitro* method of validating a sterilization treatment or a cleaning process for removing or reducing biological contaminant in a sample such as surgical and medical instruments, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors, but excluding body fluids of any living human being or animal, comprising:

(i) subjecting the sample that contains, or is suspected to contain, a contaminating biological agent selected from the group consisting of bacteria, viruses, spores, proteins and prions, to a treatment comprising exposure to one or more of a selected pH, enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam, in the presence of a defined amount of a thermostable kinase, wherein the kinase is an adenylate kinase, an acetate kinase or a pyruvate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes; wherein both the kinase and the biological agent are directly exposed to the treatment; and wherein the treatment reduces the amount or activity of the biological agent;

(ii) measuring residual kinase activity and optionally calculating the reduction in kinase activity; and

(iii) comparing said residual activity to a predetermined kinase activity, wherein the predetermined kinase activity corresponds to a confirmed reduction in the amount or activity of the biological agent under the same treatment conditions.

[19] An *in vitro* method as claimed in Claim 18, wherein the thermostable kinase retains at least 95% activity after exposure to 80°C for 10 minutes.

[20] An *in vitro* method as claimed in Claim 18 or 19, wherein the thermostable kinase is a trimeric adenylate kinase or a monomeric adenylate kinase.

[21] An *in vitro* method as claimed in Claim 20, wherein the kinase is a trimeric adenylate kinase from a *Sulfolobus sp.* or a monomeric adenylate kinase from a *Thermotoga sp.*

[22] An *in vitro* method as claimed in Claim 18, wherein the kinase is an adenylate kinase from *A. acidocaldarius*, *A. fulgidus*, *A. pernix*, *A. pyrophilus*, *B. caldotenax* BT1, *Bacillus species* PS3, *B. stearothermophilus* 11057, *B. stearothermophilus* 12001, *B. thermocatenulatus*, *C. stercocorarium*, *Methanococcus spp.*, *M. ruber*, *P. abyssi, P. furiosus, P. horikoshii, P. woesii,* R. *marinus, S. acidocaldarius, S. shibatae, S. solfataricus, T. ethanolicus*, *T. thermosulfurogenes*, *T. celere*, *T. litoralis, T. aquaticus* YT1, *T. caldophilus* GK24, *T. thermophilus* HB8*, T. maritima or T. neapolitana*.

[23] An *in vitro* method as claimed in Claim 22, wherein the kinase is a *T. litoralis* kinase*, T. maritima* kinase, or a *T. neapolitana* kinase.

[24] An *in vitro* method as claimed in any of Claims 18-23, wherein the kinase has an amino acid sequence selected from the group consisting of SEQ ID NOs: 1-25 or is encoded by a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 26-30.

[25] An *in vitro* method as claimed in any of Claims 18-24, wherein the sample is known to contain the biological agent.

[26] An *in vitro* method as claimed in any of Claims 18-25, wherein the biological agent is a transmissible spongiform encephalopathy.

[27] An *in vitro* method as claimed in Claims 18-26, wherein the thermostable kinase is dispersed within a matrix, or wherein the thermostable kinase is immobilised inside or covalently coupled onto an indicator strip, a dip stick or a bead.

[28] An *in vitro* method as claimed in any of Claims 18-27, wherein the indictor further comprises an agent to stabilise the kinase.

[29] An *in vitro* method as claimed in Claim 28, wherein the stabilising agent is selected from metal ions, sugars, sugar alcohols and gel-forming agents.

[30] An *in vitro* method as claimed in Claim 27, further comprising means to attach the

support to a surface.

[31] An *in vitro* method as claimed in Claim 30, comprising a projection, recess or aperture for attachment of the support to a surface by means of a screw, nut and bolt or clamp.

[32] An *in vitro* method as claimed in any of Claims 18-31, wherein the treatment comprises exposing the sample to a thermostable protease at a temperature in the range 50-120°C.

[33] An *in vitro* method as claimed in Claim 32, wherein the treatment comprises exposing the sample to the protease at a temperature of 60°C or above.

[34] An *in vitro* method as claimed in Claim 33, comprising exposing the sample to the protease at a pH of 9 or above.

[35] An *in vitro* method as claimed in any of Claims 18-34, wherein the kinase, prior to the treatment, has an activity of at least 500,000 Relative Light Units per mg kinase when measured in the presence of luciferin/luciferase by a luminometer.

[36] An *in vitro* method as claimed in Claim 35, wherein the predetermined kinase activity is less than 10,000 Relative Light Units per mg of kinase when measured in the presence of luciferin/luciferase by a luminometer.

[37] An *in vitro* method as claimed in any of Claims 18-36, wherein the predetermined reduction in kinase activity is equal to or greater than a 6-log reduction.

[38] An *in vitro* method as claimed in Claim 37, wherein the predetermined reduction in kinase activity corresponds to at least a 6-log reduction in the amount or concentration of kinase.

[39] An *in vitro* method as claimed in any of Claims 18-38, wherein the predetermined reduction in kinase activity corresponds to a reduction in Relative Light Units of at least 900,000 RLU.

[40] An *in vitro* method as claimed in any of Claims 18-39, wherein the confirmed reduction in the amount or activity of the biological agent is at least a 6-log reduction.

[41] An *in vitro* method as claimed in any of Claims 18-40, comprising measuring kinase activity prior to treating the sample and after treating the sample.

[42] An *in vitro* method as claimed in any of Claims 18-41, comprising treating the sample at 80°C for at least 10 minutes prior to measuring the residual activity of the kinase.

[43] An *in vitro* method as claimed in any of Claims 18-42, wherein measuring the residual activity of the kinase comprises adding a substrate comprising ADP to the residual kinase and measuring formation of ATP.

[44] An *in vitro* method as claimed in any of Claims 18-43, comprising continuing the treatment until the residual kinase activity or the reduction in kinase activity corresponds to a confirmed reduction in the amount or activity of the biological agent of at least 6 logs.

[45] An *in vitro* method of correlating the reduction in the amount or activity of a contaminating biological agent in a sample selected from the group of surgical and medical instruments, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors, but excluding body fluids of any living human being or animal, wherein the biological agent is selected from the group consisting of bacteria, viruses, spores, proteins, and prions, with the thermostable kinase activity of an indicator as claimed in any of Claims 1-10, comprising:

(i) subjecting the sample containing a defined amount of the biological agent and a

sample containing a defined amount of the thermostable kinase to a sterilization treatment comprising exposure to one or more of a selected pH, enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam, wherein both the kinase and the biological agent are directly exposed to the treatment;

(ii) measuring the residual activity of the kinase;

(iii) measuring residual activity of the biological agent; and

(iv) repeating steps (i) to (iii), wherein at least one of the treatment parameters is changed.

[46] An *in vitro* method as claimed in Claim 45, wherein the biological agent is a transmissible spongiform encephalopathy.

[47] An *in vitro* method as claimed in Claim 45 or 46, wherein the treatment parameter comprises one or more of time, temperature, pH, protease concentration, and concentration of sterilant or detergent.

[48] An *in vitro* method as claimed in any of Claims 45-47, wherein:

the treatment comprises heating the sample(s) at a temperature of between 50-140°C;

the treatment parameter is time;

and wherein steps (i) to (iii) are repeated by subjecting the sample(s) to said treatment for periods of 1, 5, 10, 20, 40 and 60 minutes.

[49] An *in vitro* method as claimed in any of Claims 45-48, wherein:

the treatment comprises exposing the sample(s) to a pH of 9-14;

the treatment parameter is time;

and wherein steps (i) to (iii) are repeated by subjecting the sample(s) to said treatment for periods of 1, 5, 10, 20, 40 and 60 minutes.

[50] An *in vitro* method as claimed in any of Claims 45-49, wherein:

the treatment comprises exposing the sample(s) to a protease at a concentration of 0.5-2 mg/ml;

the treatment parameter is time;

and wherein steps (i) to (iii) are repeated by subjecting the sample(s) to said treatment for periods of 1, 5, 10, 20, 40 and 60 minutes.

7.2 **Proposed Amendment of claims**

The Appellant would like to further amend the claims as shown in marked up copy of claims in **Exhibit A7** of which clear copy is given in **Exhibit A8** to further define the scope of claims clearly and precisely in the light of fresh objections raised by the Assistant Controller of Patents & Designs (Respondent no. 2) against novelty and inventive step of pending claims over documents D1 to D5 and lack of descriptive support for method claims and also to further define the scope of the claimed invention clearly and precisely to a person in the art. The amendment proposed in the pending claims which are all within the scope of claims prior to amendment and are fully supported by the original disclosure as tabulated below:

Claims	**Amendment in claim terms or language**	**Support in the description of PCT Application as filed**

1	for validating a sterilization treatment or a cleaning process … wherein the sterilization treatment or cleaning process comprises exposure to one or more of a selected pH, enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam	Throughout the application as filed – eg. page 28, lines 1-13. See also page 4, line 33-page 4, line 1; page 7, line 33; page 9, line 21; page 21, lines 25-26; page 22, lines 10-13 and 30-31; page 23, lines 13-31; page 24, lines 11-12 and 23-24; page 25, lines 8-10 and 23; page 26, line 31-page 27, line 1; and the Examples.
	for reducing the amount or activity of a contaminating biological agent in or on a sample … wherein the sample is selected from the group consisting of surgical and medical instruments, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors, but excluding body fluids of any living human being or animal	Throughout the application as filed – eg. at page 28, lines 15-18. See also page 4, lines 13-16; page 6, lines 15-17; page 11, lines 1-8; page 19, lines 22-29; page 21, line 25-page 22, line 6; page 23, lines 13-15; page 24, lines 11-12; page 27, lines 8-21; and the Examples.
	wherein the solid support is selected from the group consisting of a plastic, ceramic, or metallic surface,…	See page 10, lines 21-26 and 30-31.
	immobilised directly onto or inside the solid support via non-specific adsorption or chemical cross-linking	Page 11, lines 10-page 12, line 5; page 19, lines 33-34; page 22, lines 28-33; page 24, lines 14-16 and 23-27; page 44, lines 28-34; and in the Examples.
3	'Kinase' defined as 'thermostable kinase'	Previous Claim 1
4	'Kinase' defined as 'thermostable kinase' Certain species of adenylate kinase deleted from previous claim 4	Previous Claim 1
11	validating a sterilization treatment or a cleaning process	See above for Claim 1
	a biological agent in or on a sample selected from surgical and medical instruments, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors, but excluding body fluids of any living human being or animal	See above for Claim 1
	'kinase' limited to 'thermostable kinase'	Previous Claim 1

18	**for reducing the amount or activity of a contaminating biological agent … wherein the contaminating biological agent is selected from the group consisting of bacteria, viruses, spores, proteins, and prions** **a thermostable kinase selected from a trimeric adenylate kinase or a monomeric adenylate kinase**	**Throughout the application as filed – e.g. page 3, lines 13-15; page 11, lines 1-8; page 15, line 24-page 16, line 7; page 19, lines 12-17; page 20, lines 15-34; page 22, lines 22-26; page 27, lines 25-31; in PCT Claims 38 and 40; and throughout the Examples.** **Amended to be consistent with Claim 1; support is provided at page 25, line 30-page 26, line 3**
18-48	**The term 'an in vitro method' replcaed with 'a method' in the preamble of these claims**	**-**
43	**a sterilization treatment or cleaning process comprising exposure to one or more of**	**See above for Claim 1**

Further previous claims 20 and 25 deleted with renumbering of claims 21 onwards and corresponding changes in the dependencies.

8. **Objection under Section 3(c) of the Act**

The Respondent No. 2 has alleged that the "biological process indicator" defined in Claims 1-10 on file is not patentable under sections 3(c) of the act, which excludes from patentability "*the discovery of any living thing or non-living substance occurring in nature*", as the claimed subject matter is " a natural substance (for discovery of any new use)".

The "biological process indicator" defined in the attached amended claims is not a living thing and is not a non-living substance occurring in nature. The biological process indicator defined in Claims 1- 10 comprises a thermostable kinase immobilised directly onto or inside a solid support. The solid support is selected from a plastic, ceramic, or metallic surface, or an indicator strip, a dip-stick, or a bead, which are not "living things or non-living things occurring in nature". Hence, the biological process indicator comprising the thermostable kinase and the solid support is also not a "living thing or non-living substance occurring in nature" to attract Section 3(c) of the Act.

9. The biological process indicator defined in Claims 1-10 is also not a substance that "occurs in nature". In detail, an essential component of the biological process indicator is a solid support, which is selected from a plastic, ceramic, or metallic surface, or an indicator strip, a dip-stick, or a bead. Plastics and ceramics are *non-naturally occurring substances* requiring human intervention for their manufacture. Plastic and ceramic surfaces do not "occur in nature". Indicator strips, dip-sticks, and beads require human intervention for their manufacture, and do not "occur in nature". Hence, a biological process indicator comprising a plastic surface, a ceramic surface, an indicator strip, a dip-stick, or a bead is not a "naturally occurring product".

10. The Respondent No. 2 has alleged that the "biological process indicator" defined in Claims 1-10 on file is not patentable under sections 3(c) of the act, which excludes from patentability "*the discovery* of any *living thing* or *non-living* substance *occurring in nature*", as the claimed subject

matter is " a natural substance (for discovery of any new use)". This objection is totally unfounded and appears very unscientific.

- The biological process indicator is a product" comprises a thermostable kinase immobilished directly onto or inside a solid support selected from a plastic, ceramic, or metallic surface, or an indicator strip, a dip-stick, or a bead, which are not "living things or non-living things occurring in nature". Plastics, ceramics, indicator strips, dip-sticks, and bead are non-naturally occurring substance requiring human intervention for their manufacture.
- In nature, thermostable kinases are found within cells, and are **not** immobilised directly onto or inside any solid support. Human intervention is required in order to immobilise the kinase directly onto or inside the recited solid supports via non-specific adsorption or chemical cross-linking.
- Also, the kinase is pretreated to make it thermostable to withstand high temperature environment.
- Evidently, the claimed biological process indicator **does not occur in nature;but is an artificially manufactured product requiring substantial human intervention.**
- The claimed biological process indicator **is not a mere discovery.** As stated in **Lane-Fox v The Knightsbridge Electric Lighting Co. Ltd., [(1892)]9 RPC 413 at 416]** "An invention is not the same thingas a discovery. When Volta discovered the effect of an electric current from the battery on a frog's leg he made a great discovery, but no patenable invention. "Also, in **Reynolds v Herbert Smith & Co. Ltd. [(1903)20 RPC 123 AT 123]** buckley, J. stated "invention also adds to human knowledge, but not merely by disclosing something. Invention necessarily involves also the suggestion of an act to be done, and it must be an act which results in a new product, or a new result, or a new process, or a new combination for prducting an old product or an old result". Clearly, the claimed subject matter is **not a discovery**, rather, it involves various technical steps to be performed in order to prepare the new product with new reults.

11. It may thus be appreciated that claims 1-10 are not claims for a kinase available as such in nature but a **modified thermostable kinase immobilized** on or inside a solid support or covalently coupled to it which can not come under the mischief of section 3(c) of the Act. **The Respondent No. 2 refusing the application under section 3(c) indicates that he has neither read nor understood the invention** and thus, **the decision of Respondent No. 2 to refuse the present application under Section 3(c) is apparently contrary to law and unsustainable and must be overturned by the IPAB.**

12. Therefore, the presently claimed biological process indicator is a non-naturally occurring product, which is not found in nature and *requires human intervention* for its preparation. The exclusion set out in Section 3(c) of the Act does not apply to the subject-matter of Claims 1-10.

13. **Objection under Section 3(d) of the Act**

The Respondent No. 2 has alleged that the "biological process indicator" defined in Claims 1-10 on file is not patentable under sections 3(d) of the act, which excludes from patentability "*the mere discovery of a new form of a known substance which does not result in the*

enhancement of the known efficacy of that substance". In light of the Controller's decision to refuse the application for lack of novelty or inventive step over D1-D5, the Appellant/Applicant apprehend that the Respondent No. 2 considers the presently claimed biological process indicator to be merely a new form of an "*immobilised kinase"*.

14. The case of the appellant is now in the present appeal is that from the own admission of respondent No. 2 as observed in the paragraph two of the decision that " the major technical objections were on the ground of non-patentability of claims under section 3(c) and 3(i) of the Act" in the Hearing Notice on the basis of which the hearing was held .The hearing notice dated 17 July 2012 on the basis of which the hearing was held on 24 August 2012 that led to the decision of the respondent No. 2 to refuse the Application did not raise any objection on the ground of novelty or inventive step of pending claims , objection under section 3(d) or in respect of lack for descriptive support of method claims nor the respondent No. 2 mentioned about any such objection at the hearing and therefore an afterthought by the respondent No. 2, while denying the Appellant or his Agent an opportunity to counter them through arguments or to overcome them through amendment in gross violation of principle of natural justice

15. As stated above, the claimed subject matter is <u>not a discovery or a 'mere' dicovery, rather</u>, it involves various technical steps to be performed in order to prepare the new products with new results. As discussed below with respect to novelty and inventive step of the claimed subject-matter, the biological process indicator of the present invention is *entirely different technical properties* as compared to the immobilished kinases described ought not to be a new form of a known substance. Moreover, the claimed biological process indicator results in advantageous technical effects – it has significantly enhanced efficacy for validating a sterilization treatment or a cleaning process for reducing the amount or activilty of a contaminating biological agents described in cited prior art documents with ability to detect contamination in a sample beyond 6 logs. As discussed in the **affidavit of Dr J. Mark Sutton (Exhibit A9** of the Appeal), the surprising effectiveness of the presently claimed biological process indicator is demonstrated in the application as filed and is also confirmed by further experimental data obtained post-filing.

As explained below claimed biological process indicator apart from being novel is also inventive with superior efficacy over other indicators in the field with ability to detect contamination in a sample beyond 6 logs.

Therefore, the claimed biological process indicator is not merely the discovery of a new form of a known substance. *Unlike* the kinase-based agents described in the prior art (D1-D5), the presently claimed invention is effective for validating a sterilization treatment or a cleaning process for reducing the amount or activity of a contaminating biological agent in or on a sample.

16. The respondent No.2 in paragraph two of the decision that " the revision of claims (at the

hearing) leads to further evaluation for novelty and inventive step by the office" is totally unfounded and is not based on the facts of the case as stated. The only amendment made in the claims at the hearing is incorporation of feature of previous claim 3 into main claim 1 to bring claim 1 in line line with granted claim 19 of corresponding EP patent with deletion of claim 3 rendered redundant thereby

17. **Objection under Section 3(i) of the Act**

The Respondent No. 2 has alleged that the presently claimed biological process indicators, kits, and methods fall "indirectly" under the exclusion from patentability set out in Section 3(i) of the Act that bars processes for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or animals to render them free of disease or to increase their economic value or that of their products. This allegation is totally unfounded and it appears that the Respondent No. 2 has failed to appreciate the instant invention that led to such mistake on his part.

The Appellant/Applicant invention has *absolutely nothing whatsoever* to do with the treatment of any living human being or animal to render them free of disease or increase their economic value.

17.1 Firstly one has to appreciate what is the "treatment process" as recited in the claims. The biological process indicator all claimed in claims 1-10 is "for validating a treatment process for reducing the amount or activity of a "biological agent" in a sample. (specification page 3, lines 14-15)

17.2 The "biological agent" defined in the specification page 27, lines 25-31 encompasses both infectious and non-infectious agents and include bacteria, viruses, spores, proteins, peptides and prions, and specific agents of examples 14-20 of the specification.

17.3 The "treatment" or "treatment process" is defined in specification page 27 line 32 to page 28 line 13 and includes exposure to high temperature or high pH exposure at which it is not possible for a human being or an animal to survive.

17.4 The term "sample" is defined in page 28 lines 15-18 of the specification and encompasses any item, instrument, surface, fluid or material such as surgical and medical instrument, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors, and does not include any living human being or animal that is subjected to any of the treatment as defined in Section 3(i) of the Act, including a "diagnostic treatment" or other treatment. The indicator is for validation of a treatment process to ensure that the samples like surgical instruments as defined in the specification is free of harmful contaminants and safe for use in a health care environment.

17.5 Kits claimed in claims 11-16 are also for validation of such treatment process for reducing or eliminating of harmful contaminants in a sample like surgical instruments used in health care environment.

17.6 Method claims 18-44 (currently amended claims 18-42) are all drawn to method for validation of treatment process, defined by the process steps, for treatment or cleaning of a sample specifically defined in the claims **excluding body fluids of any living human being or animal**.

17.7 Claims 45-50 (currently amended claims 43-48) are all drawn to a method of correlating the reduction in the contamination or activity of a contaminating agent in a sample as defined in the claim 45 specifically excluding body fluids of any living human being or animal with the thermostable kinase activity of an indicator of the indicator claimed in any one of claims 1-10.

17.8 The biological process indicators, kits, validation methods and correlating methods defined in the amended claims do not have a diagnostic or therapeutic purpose. The sole purpose of the biological process indicator and kit defined in the attached Claims 1-17 attached herewith is to *validate* (ie. confirm the efficacy of) a sterilization treatment or a cleaning process performed on a sample as defined in the claims in order to reducing the amount or activity of a contaminating biological agent in or on the sample. Likewise, the sole purpose of the method defined in the attached Claims 18-42 is for *validating* (ie. confirming the efficacy of) such a sterilization treatment or cleaning process; and the sole purpose of the method defined in the attached Claims 43-48 is to *correlate* a reduction in the thermostable kinase activity of a biological process indicator as claimed in any of Claims 1-17 with a reduction in the amount or activity of a contaminating biological agent in or on the sample.

18. As mentioned the Respondent No. 2 has alleged that the presently claimed biological process indicators, kits, and methods fall "**indirectly**" under the exclusion from patentability set out in **Section 3(i)** of the Act that bars processes for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or animals to render them free of disease or to increase their economic value or that of their products. The present invention has *absolutely nothing whatsoever* to do with the treatment of any living human being or animal to render them free of disease or increase their economic value.

- The biological process indicator and also the claimed kits and methods are for validation (i.e., confirm the efficacy) of a treatment process to ensure that the samples like instrument, surface, fluid or material such as surgical and medical instrument, hospital gowns, bedclothes, bulk liquids, culled animal material, pharmaceuticals, workbenches, walls and floors are free of harmful contaminants (encompasses both infectious and non-infectious agents) and does not include any living human being or animal that is subjected to any of the treatment as defined in Section 3(i) of the Act, including a "diagnostic treatment" or other treatment.
- The biological process indicators, kits, validation methods and correlating methods defined in the claims do not have a diagnostic or therapeutic purpose.

19. The Respondent No. 2 refusing the application under Section 3(d) clearly indicates that he appears to have failed to appreciate the novelty and inventive merit of the claimed invention and has conveniently overlooked the significant technical effect achieved by the claimed subject matter and hence, the decision of Respondent No. 2 to refuse the present application under Section 3(d) appears to be arbitrary and without merit and must be overturned by the IPAB.

20. The fact that the Respondent No. 2 alleges that the claimed subject matter "***indirectly***" falls under the provision of Section 3(i) suggests that **he is making his own law and is not following what has been stated in the Act.** There is no concept of a subject matter being patentable "directly" or "indirectly" under Section 3(i).

In ***Hon'ble Supreme Court in (2005) 10 Supreme Court Case 437 -State of Jharkhand*** **Vs. Govind Singh,** it was held : *"When the words of a statute are clear, plain or unambiguous i.e. they are reasonably susceptible to only one meaning, the courts are bound to give effect to that meaning irrespective of consequences. The intention of the legislature is primarily to be gathered from the language used, which means that attention should be paid to what has been said as also to what has not been said."* A similar view was reiterated by the **Apex court in (1992) Supp 1 SCC 150 "State of M.P. Vs. G.S.Dall and Flour Mills" and AIR 1998 SCC 1429 "State of Gujarat Vs. Dillipbhai Nathjibhai Patel".** Speaking briefly, **the Apex Court held** *"it cannot reframe the legislation"*, as noted in **J.P. Bansal Case** "*for the very good reasons that it has no power to legislate.*"

Hence, the claimed subject-matter does not relate to any diagnostic or other treatment of any living human being or animal, to attract Section 3(i) of the Act and **the decision of Respondent No. 2 to refuse the present application under Section 3(i) is seemingly arbitrary, unsustainable, illegal, and without merit and must be overturned by the IPAB.**

21. **Novelty <u>of Claims 1-10</u>**

The Respondent No. 2 asserts that the biological process indicator defined in Claims 1-10 of the present application lacks novelty over the alleged disclosures in documents D1, D2, D3, D4, and D5. The allegations of Respondent No. 2 in respect of novelty against Claims 1-10 is totally unfounded.

21.1 Amended Claim 1 is directed to a biological process indicator for validating a defined sterilization treatment or cleaning process for reducing the amount or activity of a contaminating biological agent in or on a defined sample. The biological process indicator comprises: (a) a thermostable kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, wherein the kinase is a trimeric adenylate kinase or a monomeric adenylate kinase; and (b) a solid support, wherein the solid support is selected from the group consisting of a plastic, ceramic, or metallic surface, or an indicator strip, a dip stick, or a bead, wherein the thermostable kinase is immobilised directly onto or inside the solid support via non-specific adsorption or chemical cross-linking.

21.2 The Respondent No. 2 failed to identify any specific passage within cited documents D1, D2, D3, D4, or D5 that is alleged to disclose the biological process indicator of the present invention. The Appellant/Applicant has reviewed these documents, and submits that they each fail to disclose a biological process indicator having all of the structural and functional features required by Claim 1 of the present application.

21.3 Document D1 describes an enzyme-based monitoring device for monitoring the impact of thermal processing on an object such as a medical tool or a pharmaceutical composition. The device comprises an enzyme sealed within a container. D1 lists various enzymes, including a

kinase (see D1 page 12, line 28), but fails to disclose any *trimeric or monomeric adenylate kinase*. Furthermore, although D1 states that the enzyme may, in one embodiment, be "thermostable", D1 fails to disclose any *thermostable kinase*, let alone a thermostable kinase that has the specific thermostability requirements specified in Claim 1 of the present application.

21.4 Furthermore, the monitoring device described in D1 is *not suitable for* validating a sterilization treatment or cleaning process that comprises exposure to one or more of a selected pH, enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam, as recited in amended Claim 1 of the present application (the only treatment described in D1 is 'thermal processing' – i.e. exposing the sample to high temperature). In this regard, because the kinase is sealed within a container, the D1 monitoring device can *only* be used to validate treatments that can penetrate the seal, such as the heat treatment described in D1. The D1 device is incapable of validating a sterilization treatment or cleaning process based on pH (ie. acid/ alkali solution), enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam (as recited in amended Claim 1 of the present application), because these treatments cannot penetrate the seal of the D1 device. Hence, D1 does not disclose the presently claimed biological process indicator.

Document D2 also does not disclose a biological process indicator that has the structural or functional requirements that are recited in amended Claim 1 of the present application.

In this regard, D2 describes "reporter" molecules for use in an immunoassay. The "reporter" molecule comprises an antibody (or other analyte-specific binding agent) that is *labelled* with a thermostable kinase. Thus, the thermostable kinase is attached to an antibody/ binding agent. The thermostable kinase is not attached onto or inside *any* "solid support", let alone a solid support that is a plastic, ceramic, or metallic surface, or an indicator strip, dipstick, bead; as required by amended Claim 1 of the present application.

The D2 "reporter" molecule is used in an immunoassay to detect the presence of an analyte (such as an antigen) in a sample. The *analyte* may be immobilised onto a solid support. As a first step in the immunoassay method (illustrated in Figure 1 and in the Examples of D2), the solid support is treated with a *blocking agent* in order to block unwanted non-specific binding of reagents (eg. including the "reporter" molecule) to the exposed surfaces of the solid support. Thus, the method described in D2 includes a step that is *specifically designed in order to prevent immobilisation of the reporter molecule to the solid support*. The next reaction step is addition of the "reporter" molecule. The antibody/ binding agent component of the "reporter" binds directly to the immobilised analyte. The antibody/ binding agent does not bind directly to the solid support, because this is prevented by the blocking agent. The thermostable kinase label attached to the antibody does not interact with either the analyte or the solid support. Following binding of the antibody/ binding agent to the immobilised analyte (and washing to remove unbound reporter molecule), the linkage between the antibody/ binding agent and the thermostable kinase label is *cleaved*, thereby *releasing* the thermostable kinase label from the antibody/ binding agent.

As such, in D2, the thermostable kinase is not *immobilised directly* onto or inside a solid support at any time. Although the thermostable kinase 'label' is *brought into proximity* with the solid support during the immunoassay method (by virtue of the interaction between the antibody/ binding agent and the analyte), the thermostable kinase does not interact with the analyte or the solid support.

21.5 Documents D3, D4, and D5 also fail to disclose a biological process indicator comprising a highlythermostable kinase as defined in Claim 1 of the present application.

21.6 In detail, document D3 describes adenylate kinases from the genus *Bacillus* (preferably from *B. stearothermophilus*). D3 reports that these *Bacillus* kinases retain 99% kinase activity after exposure to 57°C for 15 minutes (D3 column 5, lines 36-38). However, D3 does not disclose *any* adenylate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, as required by Claim 1 of the present application. Indeed, D3 Figure 1 (Curve A) illustrates that the residual kinase activity of the *Bacillus* kinase after exposure to 70°C for only 15 minutes is *very low (approximately 10-15%)*. Tests conducted by the inventors of the present application confirm that *Bacillus* kinases do not retain at least 95% kinase activity after exposure to 70°C for 30 minutes (see the present application at page 5, lines 13-17, page 6, lines 25-27, and Figure 1). Thus, D3 does not disclose a "thermostable kinase" as defined in Claim 1, and therefore does not disclose the presently claimed biological process indicator.

21.7 Document D4 also fails to describe any "thermostable" kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, as required by Claim 1 of the present application. The adenylate kinase described in D4 is obtained from chicken muscle (see D4 at page 92, column 1, "2.1. Enzymes and Reagents", 2nd paragraph). As confirmed in document D3 (at column 1, lines 54- 59), adenylate kinases from animal muscles are "*very unstable"* enzymes. Hence, D4 does not disclose a "biological process indicator" having the structural or functional requirements specified in Claim 1 of the present application.

21.8 Document D5 does not disclose any thermostable adenylate kinase, let alone a thermostable trimeric or monomeric adenylate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, as specified in Claim 1 of the present application. In this regard, the only kinases described in D5 are a yeast *hexo*kinase, and a rabbit muscle *pyruvate* kinase, neither of which is a not thermostable monomeric or trimeric adenylate kinase as defined in the present claims (see D5 at page 3914, column 1, final paragraph). Hence, D5 fails to disclose a biological process indicator as presently claimed. • The presently claimed biological process indicator is therefore novel over the disclosures in each of D1, D2, D3, D4, and D5. The decision of the respondent No. 2 to refuse Claims 1-10 (and 11-17) for an alleged lack of novelty is thus without any merit should be overturned by the IPAB.

22. **<u>NOVELTY</u>**

The Respondent No. 2 asserts that the biological process indicator defined in Claims 1-10 of the present application lacks novelty over the alleged disclosures of the following prior art documents :

- WO 2004003226 (D1),
- WO 0046357 (D2),
- US 4584272 (D3),
- Michel P.E. et al.(1998) Analytica Chemica Acta, vol 360, No. 1-3.89-99 (D4)

Aflalo C. et al. (1987) Biochemistry, Vol-26 No. 13, 3913-3920 (D5)

23 As referred in **IPAB Order No. 55/2009, L J Sachs in General Tyre & Rubber Co. Vs. Firestone Tyre Co. (1972) RPC 4567 at page 485,** held: *"for anticipation to occur the antecedent document must contain clear and unmistakable directions to do what the patentee has claimed in the claim under consideration." In* ***Verdegaal Bros. v. Union Oil Co. of California*****, 814 F.2d 628, 631,** it was held**:** *"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."* In **Pope alliance Corpn. Vs. Spanish Siver Pulp & Paper Mills Ltd. A,I.R.** ***1929*** **- P.C. 38** it was held that *"The specification which is relied upon as an anticipation of the invention must give the same knowledge as the specification of the invention itself."*

24 Amended Claim 1 is directed to a product that comprises: (a) a thermostable kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, wherein the kinase is a trimeric adenylate kinase or a monomeric adenylate kinase; and (b) a solid support, wherein the solid support is selected from the group consisting of a plastic, ceramic, or metallic surface, or an indicator strip, a dip stick, or a bead, wherein the thermostable kinase is immobilised directly onto or inside the solid support via non-specific adsorption or chemical cross-linking.

25. Document D1 describes an enzyme-based monitoring device for monitoring the impact of thermal processing on an object such as a medical tool or a pharmaceutical composition. The device comprises an enzyme sealed within a container. D1 lists various enzymes, including a kinase (see D1 page 12, line 28), but fails to disclose any *trimeric or monomeric adenylate kinase*. Furthermore, although D1 states that the enzyme may, in one embodiment, be "thermostable", D1 fails to disclose any *thermostable kinase*, let alone a thermostable kinase that has the specific thermostability requirements specified in Claim 1 of the present application. Furthermore, the monitoring device described in D1 is *not suitable for* validating a sterilization treatment or cleaning process that comprises exposure to one or more of a selected pH, enzyme, detergent, chemical sterilant, gas-phase sterilant, or wet or dry steam, as recited in amended Claim 1 of the present application - the only treatment described in D1 is 'thermal processing' – i.e. exposing the sample to high temperature. In this regard, because the kinase is sealed within a container, the D1 monitoring device can *only* be used to validate treatments that can penetrate the seal, such as the heat treatment described in D1.

26. D2 describes "reporter" molecules for use in an immunoassay. The "reporter" molecule comprises an antibody (or other analyte-specific binding agent) that is *labelled* with a thermostable kinase. Thus, the thermostable kinase is attached to an antibody/ binding agent and not attached onto or inside *any* "solid support", let alone a solid support that is a plastic, ceramic, or metallic surface, or an indicator strip, dipstick, bead. The D2 "reporter" molecule is used in an immunoassay to detect the presence of an analyte (such as an antigen) in a sample. The *analyte* may be immobilised onto a solid support. The antibody/ binding agent does not bind directly to the solid support, because this is prevented by the blocking agent.

D3-D5 only discloses certain kinases, which are different from the kinases used in the present invention, and moreover, D3-D5 are silent about a solid support, wherein the solid support is selected from the group consisting of a plastic, ceramic, or metallic surface, or an

indicator strip, a dip stick, or a bead, and also talks nothing about the kinase being immobilised directly onto or inside the solid support via non-specific adsorption or chemical cross-linking.

27. D3 describes adenylate kinases from the genus *Bacillus* (preferably from *B. stearothermophilus*). D3 reports that these *Bacillus* kinases retain 99% kinase activity after exposure to 57°C for 15 minutes (D3 column 5, lines 36-38). However, D3 does not disclose *any* adenylate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, as required by Claim 1 of the present application. Indeed, D3 Figure 1 (Curve A) illustrates that the residual kinase activity of the *Bacillus* kinase after exposure to 70°C for only 15 minutes is *very low (approximately 10-15%)*.

28. D4 also fails to describe any "thermostable" kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes. The adenylate kinase described in D4 is obtained from chicken muscle (see D4 at page 92, column 1, "2.1. Enzymes and Reagents", 2nd paragraph). As confirmed in document D3 (at column 1, lines 54- 59), adenylate kinases from animal muscles are "*very unstable"* enzymes. Hence, D4 does not disclose a "biological process indicator" having the structural or functional requirements specified in Claim 1 of the present application.

29. Document D5 does not disclose any thermostable adenylate kinase, let alone a thermostable trimeric or monomeric adenylate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes. The only kinases described in D5 are a yeast *hexo*kinase, and a rabbit muscle *pyruvate* kinase, neither of which is a thermostable monomeric or trimeric adenylate kinase.

30. The Respondent No. 2 has clearly erred in refusing the application on the grounds of anticipation as **none of the cited prior art documents disclose all the features recited in the claims of the present application in order to render the claims anticipated.** The presently claimed biological process indicator is therefore novel over the disclosures in each of D1, D2, D3, D4, and D5, and **the decision of Respondent No. 2 to refuse the present application on the ground of lack of novelty seems to be arbitrary, factually incorrect, and without merit and must be overturned by the IPAB.**

31. **INVENTIVE STEP**

The test to ascertain whether an invention involves an inventive step is expressed in **Halsbury Laws of England** as: '*was it for practical purposes obvious to the skilled worker, in the field concerned, in the state of knowledge existing at the date of the patent to be found in the literature then available to him, that he should or would make the invention the subject of the claim concerned.*' In other words, the question to be answered in determining inventive step is 'Would a non-inventive mind have thought of the alleged invention?' If the answer is 'no', then the invention is non-obvious. If the patent claimed merely includes the development of some existing trade, in the sense that it is a development as would suggest itself to an ordinary person skilled in the art, it would fail the test of non-obviousness. **Lord Reid said in Technograph v. Mills and Rockley [1972] R.P.C 346**: '*When dealing with obviousness, unlike novelty, it is permissible to make a*

'mosaic' out of the relevant documents, but it must be a mosaic which can be put together by an ***unimaginative man*** *with no inventive capacity*'.

32. The Respondent No.2 has alleged that the biological process indicator defined in Claims 1-10 of the present application does not involve any inventive feature as compared to the alleged disclosures in documents D1-D5, and therefore lacks an inventive step.

33. However, as explained below there is no teaching or disclosure or suggestion in any of the prior art document of the (a) thermostable kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, wherein the kinase is a trimeric adenylate kinase or a monomeric adenylate kinase, (b) wherein the thermostable kinase is immobilised directly onto or inside the solid support via non-specific adsorption or chemical cross-linking, and (c) using said immobilized thermostable kinase *for validating a sterilization treatment or a cleaning process for reducing the amount or activity of a contaminating biological agent in or on a sample. There is also no suggestion or disclosue or motivation is any of the prior art documents to modify those inventions to arrive at the presently claimed invention. There is no motivation or hint for a person skilled in the art to combine the teachings of the cited prior art documents, and even if combined, the person skilled in the art will not arrive at the presently claimed invention.*

34. As discussed above, D1 devices are suitable for monitoring the impact of thermal processing (ie. heat treatment) on a test object or sample, while being incapable of monitoring treatment processes that cannot penetrate the seal and access the enzyme. D1 does not provide any suggestion or motivation for the skilled person in the Art to remove the seal from the monitoring device and thereby allow direct access to the enzyme by the recited treatment processes. Indeed, D1 teaches that the seal is an *essential feature* of the device because it "*prevents* the entry of moisture into the container when the latter is placed into the high moisture content atmosphere during thermal processing of the object" (see D1 at page 11, lines 14-18). Thus, D1 addresses the technical problem of keeping the enzyme dry by avoiding contact with liquids/ high moisture-content gasses. In light of the teaching in D1, the skilled person in the Art would conclude that sealing the enzyme in a container *away* from the environment of the sample is essential for the efficient working of the monitoring device. Finally, D1 provides a 'shopping list' of enzymes for use in the monitoring device, and indicates that *amylases* are preferred. As such, the skilled person reading D1 would be led towards the use of an amylase-based monitoring device, and would not find any suggestion or motivation to substitute the amylase with a *highly thermostable trimeric or monomeric adenylate kinase* as required by the claims of the present application. The presently claimed biological process indicator therefore would not have been obvious to the ordinary skilled person in the Art in light of D1.

35. The thermostable kinase is used for *entirely different purposes* in D2 and in the present invention. D2 relates to an immunoassay for detecting/ quantifying an analyte in a sample (optionally *following* sterilization or cleaning of the sample), wherein the analyte (if present) is immobilised onto a solid support. In D2, the *only* component that is immobilised/ attached directly to the solid support is the analyte. The presence of immobilised analyte is detected using a reporter composition, which comprises an antibody or binding agent specific to the analyte. The

antibody/ binding agent in the reporter composition binds to the immobilised analyte (if present) thereby enabling detection of the analyte. If only very small amounts of analyte are immobilised onto the solid support, the signal from this immunoassay may be weak. D2 addresses this problem by *labelling the reporter antibody/ binding agent with a thermostable kinase*, which amplifies the binding signal via the formation of ATP. There is no teaching or suggestion in D2 to attach the thermostable kinase to a solid support. Indeed, it is *essential* to the detection method described in D2 that the reporter molecule comprising the thermostable kinase and antibody/ binding agent is free in solution and available for binding to immobilised analyte. If the reporter molecule were *immobilised within* the solid support, or *immobilised/ attached directly onto* the solid support, the reporter molecule would not be able to bind to analyte immobilised on the solid support and the immunoassay described in D2 simply would not work. For this reason, as a first step in the immunoassay method (illustrated in Figure 1 and in the Examples of D2), the solid support is treated with a *blocking agent* in order to block unwanted non-specific binding of reagents (eg. including the "reporter" molecule) to the exposed surfaces of the solid support. Thus, the method described in D2 includes a step that is *specifically designed in order to prevent immobilisation of the reporter molecule/ kinase to the solid support*. In contrast, in the biological process indicator of the present invention, the thermostable kinase is immobilised directly inside or onto a solid support. The presently claimed biological process indicator is thus *entirely different from and technically incompatible with* the reporter molecule described in D2. D2 also fails to suggest the presently claimed method, in which the thermostable kinase is directly exposed to the sterilization treatment or cleaning process, and thus acts as an indicator to validate the treatment process by mimicking the response of the biological agent to the treatment process conditions. According to D2, the "reporter molecule" is added to the sample after any treatment steps have been completed. Thus, the "reporter" described in D2 is not directly exposed to any sterilization treatment or cleaning process. As such, a skilled person reading D2 would not have considered it obvious to directly expose the thermostable kinase to a decontamination treatment process. Furthermore, a skilled person reading D2 would not have been motivated to expose the D2 "reporter" to a sterilization treatment or cleaning process as defined in the pending claims. In this regard, a skilled person would understand that the binding agent (eg. antibody) component of the D2 "reporter" would be inactivated/ denatured by the treatment processes defined in the pending claims and would therefore be *incapable of performing its binding/ detection functions*.

36. Documents D3, D4, and D5 do not relate to the same technical problem as the present invention, because they are not directed to the validation of sterilization treatments or cleaning processes for reducing the amount or activity of a contaminating biological agent in or on a sample. In particular, none of D3-D5 suggests the use of a highly thermostable trimeric adenylate kinase or a monomeric adenylate kinase as defined in Claim 1 of the present application. D3 does not relate to the same category of kinase enzymes as defined in Claim 1, and does not suggest the presently claimed biological process indicator. Document D4 describes the development of a biosensor to allow the specific detection of ATP, ADP, or AMP in a sample. D4 thus relates to an entirely different technical problem from the present invention, and it is highly unlikely that the skilled person seeking to validate a sterilization treatment or cleaning process for reducing the amount or activity of a

contaminating biological agent in or on a sample would even consider this document. D4 fails to appreciate the need for a *highly thermostable* trimeric or monomeric adenylate kinase as recited in present Claim 1. In this regard, D4 uses adenylate kinases obtained from chicken muscle, which are confirmed in document D3 to be "*very unstable"* enzymes, and are therefore *entirely unsuitable* in the biological process indicator of the present invention. Document D5 is an academic study into "the theoretical principles for the interaction of diffusion and catalysis" in the microenvironment of enzymes that produce and use ATP. This document is therefore entirely irrelevant to the validation of sterilization treatment or cleaning processes as defined in the claims of the present application, and the skilled person seeking to validate such a process would not even consider D5. Even if the skilled person did turn to D5, the only kinases enzymes disclosed in D5 are a yeast hexokinase and a rabbit muscle pyruvate kinase. D5 fails to suggest *any* trimeric or monomeric adenylate kinase – let alone a *thermostable* trimeric or monomeric adenylate kinase that retains at least 95% kinase activity after exposure to 70°C for 30 minutes, as specified in Claim 1 of the present application.

37. In summary, the presently claimed biological process indicator is highly effective for validation of a sterilization treatment or a cleaning process for reducing the amount or activity of a contaminating biological agent in or on a sample and would not have been obvious to a person of ordinary skill in the Art in light of the alleged teaching in cited documents D1-D5. This is further evidenced by the Affidavit of Dr. J. Mark Sutton (**Exhibit A9 of the Appeal**).

38. It appear to us that the claimed biological process indicator is highly effective for validation of a sterilization treatment or a cleaning process for reducing the amount or activity of a contaminating biological agent in or on a sample (as defined in Claim 1) and would not have been obvious to a person of ordinary skill in the Art in light of the alleged teaching in cited documents D1-D5. This is further evidenced by the Affidavit of Dr. J. Mark Sutton (**Exhibit A9**) The claimed subject-matter is therefore inventive, and the decision of respondent No, 2 to refuse Claims 1-10 (and 11-17) because of lack of inventive step is without merit.

39 It is the admitted position that the corresponding patents have been granted in all major jurisdiction including Australia, Canada, EPO, USA and Japan, which further establishes novelty and inventive step of claimed invention. EP and US patents have been granted by the EPO and the USPTO after duly considering the cited documents D1-D5, as evident from the bibliographic data of granted EP patent No. 1 75 6296 and US patent no. 8,389,208 attached herewith with granted claims (**Exhibits A10 and A11**), with broader scope than the claims of the instant application as currently amended.

40. The contain finding arised in the impugned order (not raised earlier in the Hearing Notice or at the hearing) has been duly addressed by deletion of the term 'in vitro' from the preamble of method claims 18 -48 as alleged by the appellant.

41. The Respondent No. 2 refused the application without giving the appellant/applicant or his agent opportunity of being heard in respect of grounds of novelty, inventive step, non-

patentable subject matter under Section 3(d) and lack of descriptive support for method claims taken in the decision as an afterthought in contravention of the statutory safeguard of the appellant under Sections 14 and 15 of the Patents Act, 1970 that guarantees an opportunity to the applicant to be heard by the Controller before taking any adverse decision and enable him to traverse the objections or overcome them through amendments to meet the requirement of the Act.

42. The Respondent No. 2 has failed to distinguish mere discovery of a living or non-living thing occurring in nature, which is barred from patentability under Section 3(c) with a new and useful article like an indicator strip, stick or bead manufactured from a modified form of an enzyme kinase with a solid support integrated with and into it through chemical and/or physical bonding process that seems to have prompted him to maintain the objection under Section 3(c) of the Act.

43. In respect of novelty and inventive step in the FER that was reiterated in the impugned order though waived in the hearing notice. The respondent no. 2 has overlooked the superior efficacy of the invented indicator compared to prior art indicators in the same field that prompted him to raise a new objection under Section 3(d) not mentioned in the hearing notice or during prosecution.

44. The claimed invention that relates to a biological process indicator for evaluation of sterilization or cleaning treatment process in a health care environment to ensure that items like surgical instruments, bedsheets, hospital gowns etc. are substantially free from harmful contaminants for safe use and confused it with a therapeutic surgical, diagnostic or other treatment of a human being or animal that prompted him to maintain the objection under Section 3(i) of the Act.

45. It appears to us that argument addressed on behalf of appellant and written – submission filed have not been considered carefully. The impugned order is passed without application of mind. It should have been passed after considering the material on record and affidavit of export. It is also matter of fact that this similar invention of corresponding patents have been granted in all major jurisdiction. The details of such countries are given, however no provivences is given by Respondent No. 2. The same is not acceptable.

46. In the light above, the impugned order set aside by allowing appeal. The patent be granted forthwith.

47. No cost.

-Sd/- **-Sd/-**

(Dr. Onkar Nath Singh)
Technical Member (PVPAT)

(Justice Manmohan Singh)
Chairman

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