RESPONSE TO THE FIRST EXAMINATION REPORT

PATENT APPLICATION NO.: 202011022819

VIDE E-FILING

Concerned Controller : Shri Sandeep Kumar

To,
The Controller of Patents,
The Patent Office,
New Delhi 110078

Re: Indian Patent Application No. **202011022819** filed on **31/05/2020**
Last Date to put Application in Order for Grant: 02/03/2022
Applicant: **University of Petroleum and Energy Studies**

Respected Sir,

This is with reference to the First Examination Report (FER) dated September 2nd 2021, in respect of the above-mentioned patent application **202011022819**. The Applicant hereby dealt with each objection raised and the observations made in the FER, hereinbelow.

At the outset, it is humbly submitted that the Applicant, to expedite the allowance of the patent application.

Invention:

The present invention discloses a system and method for identifying and monitoring a person infected by a virulent respiratory virus. To start with,

the system and method utilizes a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. The thermal screen is characterized that, a monitoring module communicating with the thermal camera to monitor the body temperature of the person to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body temperature of the person is automatically identified by executing a color detection module included in the thermal camera. The system and method include a notification device connected with the thermal camera to initiate a notification signal on receiving the command signal from the thermal camera. Further, the system and method include a camera configured with the thermal camera to consecutively captures an image of an infected person present in the proximity of the thermal camera. The camera includes a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

RESPONSE TO THE EXAMINER'S OBJECTIONS

PART-II: DETAILED TECHNICAL REPORT

B. Detailed observations on the requirements under the Act:
(1) Inventive Step:

As regards to object (1) Inventive Step of Part II (B) of the FER, the Ld. Controller has stated Claim(s) (1-8) lack(s) inventive step, being obvious in view of teaching (s) of cited document(s) above under reference for the following reasons:

In view of the following documents:
D1: KR101112125B1; D2: CN111160322A; D3: KR102021999B1;

D1: KR101112125B1 discloses (see Whole document) a visitor body temperature measuring apparatus installed in the entrance of a public place to measure a visitor's body temperature, and a camera module for photographing a subject image, and a thermal image. It is configured to include a thermopile array sensor module for measuring the body temperature of a person. The measured temperature is displayed through an LCD (LCD) or the like, and when the measured temperature exceeds a preset reference temperature, the camera module is operated to capture an image of the subject and transmits the captured image and the measured temperature information to an external device at a central location.

D2: CN111160322A discloses (see Whole document) an intelligent biological safety protection channel comprising an infrared thermal imaging thermal detector, a human body infrared induction switch and a camera lens mounted at the upper end, facing the personnel and/or living body entering direction, of the entrance door frame wherein the big data information acquisition system is used for receiving body temperature alarm information from the monitoring system, receiving face information from the face recognition system, and storing the received information for related personnel to check and apply. The intelligent biological safety protection channel is used for replacing manual work to automatically carry out body temperature testing and identity information acquisition on personnel, efficiently controlling the epidemic prevention condition of a public environment and the comprehensive sterilization of viruses and bacteria, and rapidly and efficiently controlling the propagation of the viruses and bacteria.

D3: KR102021999B1 discloses (see Whole document) a human body fever monitoring alarm device that measures and monitors the body temperature of a passer by using a CCTV combined thermal imager and a general camera and effectively performs a fever alarm when the body temperature

is not normal, comprising: a control unit; a face detection unit that extracts only the face region of the passer from the visible light image captured by the general camera and is within the region; a disease determination unit for determining whether or not a disease exists by measuring body temperature by analyzing the facial temperature distribution map of the face region extracted by the face extraction unit and includes a warning unit for warning of suspected disease.

Therefore, at the time of filing of instant application, it would have been obvious to a person skilled in the art to combine the subject matters of D1, D2, and D3 without the exercise of inventive skill to produce the instant invention, hence, the subject matter of claims 1-8 as claimed in instant application does not constitute an inventive step and falls under Section 2(1)(ja) of The Patents Act, 1970 (as amended).

With regards to the above objection, the Applicant humbly submits that the present invention includes inventive concept under section 2(1) (ja) of the Indian Patent Act, 1970 (amended in 2005), as the present invention involves technical advancement compared to the existing knowledge and has economic significance, thus making the invention not obvious to a person skilled in the art.

The present invention has technical advancement over the existing/conventional method for screening and detecting the temperature, physical, chemical and biological temperatures of human body using thermal imaging platform wirelessly and transmitting signals for further action. The present invention also has technical advancement over the existing/conventional method for medical diagnosis, agriculture, tracking, and reorganization of humans along with their facial expressions using real-time applications of thermal imaging system.

The novel system and method are utilized for identifying and monitoring a person infected by a virulent respiratory virus. The system and method include a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. An important feature of the present invention is to monitor the body temperature of the person using a monitoring module to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body temperature of the person is automatically identified by executing a color detection module included in the thermal camera. Another important feature of the present invention is to initiate a notification signal to a notification device upon receiving the command signal from the thermal camera. Further, the important feature of the present invention is to consecutively capture a high-resolution image of an infected person in proximity of the thermal camera using a camera configured with a paced face detection module.

Further, the present invention has economic significance since the system simplifies and advances the use of thermal camera configured with a color detection module to automatically identify the body temperature of the infected person and obtaining a high-resolution image of the infected person in proximity of the thermal camera using a camera configured with a paced face detection module.

In order to furnish the INVENTIVE STEP of the present invention w.r.t cited document D1, it is respectfully submitted herewith that:

D1 relates to an apparatus and method used for measuring the body temperature of a visitor. The invention D1 addresses the situation of capturing the image of the visitor and measuring the thermal image to reflect human appearance on a mirror. The invention D1 can proactively sense the body temperature of the person approaching the mirror by capturing the image of the person.

D1 technically deals with a sensing means which is a visitor body temperature measurement apparatus including a touch button or a photosensor for sensing the approach of a person in front of the mirror. In particular, D1 is configured to enable a thermopile array sensor module to measure the thermal image of the person captured using a camera module, wherein the camera module is operated through a control means upon measuring the body temperature of the person exceeds a preset reference temperature. Subsequently, storing the subject image captured by the camera module in a storage means. Further, the visitor body temperature measurement apparatus includes a transmission means for transmitting the stored subject image to the outside through a display mean for displaying the body temperature of the person measure using the thermopile array sensor module. Later, the visitor body temperature measuring apparatus includes a message display means for displaying a guide message or any advertising message about the temperature measurement to the person approaching the mirror.

However, D1 does not disclose all the key/novel aspects disclosed in the principal independent claim 1 and 11 (as amended) of the present invention. Primarily, the problem area addressed by D1 is entirely different from the problem area addressed by the present invention.

The principal independent claim 1 (as amended) of the present invention is directed to a system and method for identifying and monitoring a person infected by a virulent respiratory virus. To start with, the system and method utilizes a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. The thermal screen is characterized that, a monitoring module communicating with the thermal camera to monitor the body temperature of the person to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body

temperature of the person is automatically identified by executing a color detection module included in the thermal camera. The system and method include a notification device connected with the thermal camera to initiate a notification signal on receiving the command signal from the thermal camera. Further, the system and method include a camera configured with the thermal camera to consecutively captures an image of an infected person present in the proximity of the thermal camera. The camera includes a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

With reference to principal independent claim 1 (as amended), D1 does not disclose a system and method for automatically identifying the body temperature of the person in proximity to the thermal camera by executing a color detection module included in the thermal camera. Also, D1 does not disclose a system and method for consecutively capturing an image of the infected person present in proximity of the thermal camera and obtaining a high-resolution image of the infected person using a paced face detection module executed using a face detection algorithm.

Thus, the Applicant submits that taking into consideration D1, it would not be obvious to the person skilled in the art to arrive at the present invention and the constructional changes and/or changes in the system recited by the claims are not simple modifications of a known device and/or routine practice followed by the person skilled in the art. Therefore, claims 1-5 (as amended) do not come within the scope of obviousness, especially since the resulting advantages would not have been readily foreseeable to a person skilled in the art at the time of invention.

In order to furnish the INVENTIVE STEP of the present invention w.r.t cited document D2, it is respectfully submitted herewith that:

D2 discloses a system and method for providing an intelligence biological safety protection passageway at an entrance in a selected area. The invention D2 addresses the situation of enabling a disinfection device based on the human body activity information received from the human body infrared induction switch. The invention D2 can proactively monitors the count of flow quantity of the personnel using a monitoring system based on the activity of the human body information received from the human body infrared induction switch.

D2 technically deals with receiving the human body temperature using an infrared thermal imaging thermometer and comparing the data with normal body temperature. Subsequently, if the data exceeds the normal body temperature value, an alarm is given and the alarm information is transmitted to a cloud big data information acquisition system. In particular, D2 utilizes a face recognition system for processing the received face information to obtain the identity information of the personnel and transmitting the identity information to the cloud big data information acquisition system. Further, the big data information acquisition system is used for receiving body temperature alarm information from the monitoring system, face information from the face recognition system, and storing the received information for related personnel to check and apply.

However, D2 does not disclose all the key/novel aspects disclosed in the principal independent claim 1 (as amended) of the present invention.

The principal independent claim 1 (as amended) of the present invention is directed to a system and method for identifying and monitoring a person infected by a virulent respiratory virus. To start with, the system and method utilizes a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. The thermal screen is characterized that, a monitoring module communicating with the thermal camera to monitor the body temperature

of the person to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body temperature of the person is automatically identified by executing a color detection module included in the thermal camera. The system and method include a notification device connected with the thermal camera to initiate a notification signal on receiving the command signal from the thermal camera. Further, the system and method include a camera configured with the thermal camera to consecutively captures an image of an infected person present in the proximity of the thermal camera. The camera includes a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

With reference to principal independent claim 1 (as amended), D2 does not disclose a system and method for automatically identifying the body temperature of the person in proximity to the thermal camera and determine if the body temperature of the person is greater than a threshold value using a color detection module to transmit a command signal. Also, D2 does not disclose a system and method for initiating a notification signal upon receiving the command and enabling the camera to consecutively capture the image of infected person using a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

Thus, the Applicant submits that taking into consideration D2, it would not be obvious to the person skilled in the art to arrive at the present invention and the constructional changes and/or changes in the system recited by the claims are not simple modifications of a known device and/or routine practice followed by the person skilled in the art. Therefore, claims 1-5 (as amended) do not come within the scope of obviousness, especially since the resulting advantages would not have been readily foreseeable to a person skilled in the art at the time of invention.

In order to furnish the INVENTIVE STEP of the present invention w.r.t cited document D3, it is respectfully submitted herewith that:

D3 discloses a system and method for monitoring body temperature of a pedestrian using a CCTV coupled thermal camera. The invention D3 addresses the situation of generating an alarm when the body temperature of a passenger measure using a dual camera configured with a general camera and a thermal camera. The invention D3 can proactively utilize a face detection unit to detect an outermost box-shaped coordinate value of a face area by extracting only a face area of a passer by a face recognition program from a visible light image photographing a passer who is virtually set in the general camera by the control unit.

D3 technically deals with a face extracting unit extracting only a face region located at an outermost box-shaped coordinate value of the face region from the thermal image captured by the thermal camera using the detected outermost box-shaped coordinate value of the face region under the control of the controller. In particular, D3 utilizes the controller to compare the reference temperature distribution of the pre-stored face region with the face temperature distribution of the face region extracted by the face extraction unit to determine whether the disease, the heat distribution of the whole body to determine whether the disease. Subsequently, the disease determination unit judges whether or not a high fever using only the heat distribution of the face region, which is a heat sensitive portion, to significantly reduce the amount of calculation necessary for the determination. The temperature of the visible light image is superimposed on the face region of the visible light image captured by the general camera by superimposing temperature distribution information on the face of the face determined by the thermal camera from the face extractor by a control signal of the disease determining unit. Further, a face superimposing unit for superimposing and outputting only the portion as thermal data and displaying a natural image as a whole by displaying the data of other

regions except the face as visible light image data and human body monitoring fever alarm device including a warning unit for warning the suspected disease.

However, D3 does not disclose all the key/novel aspects disclosed in the principal independent claim 1 (as amended) of the present invention.

The principal independent claim 1 (as amended) of the present invention is directed to a system and method for identifying and monitoring a person infected by a virulent respiratory virus. To start with, the system and method utilizes a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. The thermal screen is characterized that, a monitoring module communicating with the thermal camera to monitor the body temperature of the person to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body temperature of the person is automatically identified by executing a color detection module included in the thermal camera. The system and method include a notification device connected with the thermal camera to initiate a notification signal on receiving the command signal from the thermal camera. Further, the system and method include a camera configured with the thermal camera to consecutively captures an image of an infected person present in the proximity of the thermal camera. The camera includes a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

With reference to principal independent claim 1 (as amended), D3 does not disclose a system and method for automatically identifying the body temperature of the person in proximity to the thermal camera and determine if the body temperature of the person is greater than a threshold value using a color detection module to transmit a command signal. Also, D3 does not disclose a system and method for initiating a notification signal

upon receiving the command and enabling the camera to consecutively capture the image of infected person using a paced face detection module to obtain a high-resolution image of the infected person by executing a face detection algorithm.

Thus, the Applicant submits that taking into consideration D3, it would not be obvious to the person skilled in the art to arrive at the present invention and the constructional changes and/or changes in the system recited by the claims are not simple modifications of a known device and/or routine practice followed by the person skilled in the art. Therefore, claims 1-5 (as amended) do not come within the scope of obviousness, especially since the resulting advantages would not have been readily foreseeable to a person skilled in the art at the time of invention.

Thus, the subject matter of the claims 1-5 (as amended) are inventive and hence, claims 1-5 are not obvious over the cited prior art thus satisfying the requirements for Inventive Step in accordance with section 2(1)(ja) of the Patents Act, 1970 (as amended).

In view of the above submissions, the Ld. Controller is humbly requested to withdraw the objection.

(2) NON-PATENTABILITY:

As regards objection (2) NON-PATENTABILITY of part II (B) of the FER, the Ld. Controller has stated as follows:

(I) Claim(s) (1-8) are statutorily non-patentable under the provision of clause (3(k)) of Section 3 for the following reasons:

The subject matter of claims 1-8 falls under Section 3(k) of The Patents Act, 1970 (as amended).

(II) Claim(s)of the instant application conflict(s) with claim(s) of co-pending application no.

With regards to objection (I), the Applicant hereby submits amended set of claims (1-5) does not fall under section 3(k) of The Patents Act, 1970 (as amended).

In order to furnish PATENTABILITY of the present invention under Section 3(k) of Indian Patents Act 1970, the Applicant relies on Guidelines for Examination of Computer Related Inventions (CRIs) (2017), as provided by the Indian Patent Office.

At the outset, the Applicant takes this opportunity to draw the Ld. Controller's attention to the facts related to the 'Determination of excluded subject matter relating to CRIs' (Page 15, Section 4.5 of the CRI Guidelines) as reproduced below:

> "Since patents are granted to inventions, whether products or processes, in all fields of technology, it is important to ascertain from the nature of the claimed Computer-related invention whether it is of a technical nature involving technical advancement as compared to the existing knowledge or having economic significance or both, and is not subject to exclusion under Section 3 of the Patents Act.
>
> ……
>
> What is important is to judge the substance of claims taking whole of the claim together. If any claim in any form such as method/process, apparatus/system/device, computer program product/ computer readable medium falls under the said excluded categories, such a claim would not be patentable. However, if in substance, the claim, taken as whole, does not fall in any of the excluded categories, the patent should not be denied. Hence, along with determining the merit

of invention as envisaged under Sections 2(1) (j), (ja) and (ac), the examiner should also determine whether or not they are patentable inventions under Section 3 of the Act."

Relying on the above, the Applicant humbly submits that the objective technical problem addressed by the present invention is that screening and detecting the temperature, physical, chemical and biological temperatures of human body using thermal imaging platform wirelessly and transmitting signals for further action. Also, the current system and method performs medical diagnosis, agriculture, tracking, and reorganization of humans along with their facial expressions using real-time applications of thermal imaging system. Thus, the existing system and method fail to provide efficiently and effectively measure the human body temperature and capture the image of the infected on detecting virus-positive so that the infected person cannot run away and automatically capture the information of the infected person so that an effective quarantine process can be initiated.

To **overcome said technical problem**, the present invention discloses a system and method for identifying and monitoring a person infected by a virulent respiratory virus. The system and method include a thermal camera configured to perform thermal screening on the person present in a proximity to detect body temperature of the person. An important feature of the present invention is to monitor the body temperature of the person using a monitoring module to determine if the body temperature of the person is greater than a threshold value to transmit a command signal. The body temperature of the person is automatically identified by executing a color detection module included in the thermal camera. Another important feature of the present invention is to initiate a notification signal to a notification device upon receiving the command signal from the thermal camera. Further, the important feature of the present invention is to consecutively capture a high-resolution image of an infected person in

proximity of the thermal camera using a camera configured with a paced face detection module.

The Applicant takes this opportunity to draw the Ld. Controller's attention to the fact that the claims already recite the hardware features, i.e., camera, monitoring module, color detection module, notification device, paced face detection module and face detection algorithm. Said structural limitation has also been supplemented with a reference numeral in the claims to increase their intelligibility and readability.

The Applicant humbly submits that the claims of the present invention should be considered as a practical application of a computer process that monitors the body temperature of the person in proximity of a thermal camera to determine if the body temperature of the person is greater than a threshold value. Also, the system and method utilize a notification device to initiate a notification signal upon receiving a command signal from the thermal camera that the body temperature is beyond the threshold. Further, the system and method consecutively capture an image of the infected person in proximity of the thermal camera using a camera configured with a paced face detection module. Therefore, the method and system according to the present invention provides an apparent technical contribution/technical advance presenting distinct advantages over the hitherto known techniques.

Further, the Applicant submits that the present invention has economic significance since the system simplifies and advances the use of thermal camera configured with a color detection module to automatically identify the body temperature of the infected person and obtaining a high-resolution image of the infected person in proximity of the thermal camera using a camera configured with a paced face detection module.

Accordingly, the subject matter of the claims does not fall within the purview of Section 3(k) the Indian Patents Act.

With regards to objection (II), the Applicant hereby submits **that Claim(s) of the instant application does not conflict(s) with claim(s) of any co-pending application.**

With due consideration to the submissions made hereinabove, the Ld. Controller is humbly requested to reconsider and waive the objections.

(4) SUFFICIENCY OF DISCLOSURE:

(I) The complete specification does not fully and particularly describe the invention and its operation and the method by which it is to be performed in respect of:

The vague and imprecise statement "the spirit and scope of the invention" in the paragraph [0051] of the description implies that the subject-matter for which protection is sought may be different to that defined by the claims and makes it unclear as per Section 10(4)(a) of The Patents Act, 1970 (as amended), hence, these should be deleted from the description.

With regards to objection (I), the Applicant hereby deletes the vague and imprecise statement "the spirit and scope of the invention" in the paragraph [0051] of the description to imply with the subject-matter for protection as per Section 10(4)(a) of The Patents Act, 1970 (as amended)

In light of the above amendments and submission, the Ld. Controller is humbly requested to withdraw the objection.

(5) OTHERS REQUIREMENTS:

(I)

[1]. Each main feature mentioned in the claim shall be followed by the reference sign used in that drawing, to increase the intelligibility of the claims.

[2]. The independent claims should be cast in the two-part form where appropriate, with those features known in combination from the prior art being placed in the preamble and the remaining features being included in the characterizing part.

[3]. While there is no restriction as to the number of claims, it is advisable to limit the number of claims, as well as the number of the independent claims in a single application so that the claims are all of cognate character and are linked so as to form a single inventive concept. All the essential features shall be included in the independent claim(s) and verbosity and redundancy must be avoided in order to achieve the conciseness in the structure and subject matter of the claim.

[4]. In case the applicant decides to amend the claims subsequent to this report, the same shall be drafted afresh to include the technical advancement over the prior art as required under Section 2(1)(j) and under Section 2(1)(ja) of The Patents Act,1970 (as amended). Please indicate in the response communication, the support for the claims in the original specification, as required under Section 10(4) of the Act. Care shall be taken that requirements under Section 59(1) of the Act should also be met. Also provide an additional copy of marked-up amendments (highlighting the amendments) as per Rule 14(2) of The Patents Rule, 2003 (as amended).

With regards to objection (1), the Applicant hereby submits an amended set of claims followed by the reference sign used in that drawing, to increase the intelligibility of the claims.

With regards to objection (2), the Applicant hereby submits an amended set of claims in the two-part form where appropriate, with those features known in combination from the prior art being placed in the preamble and the remaining features being included in the characterizing part.

With regards to objection (3), the Applicant hereby submits an amended set of claims by limiting the number of claims, as well as the number of the independent claims in a single application so that the claims are all of cognate character and are linked so as to form a single inventive concept. All the essential features are included in the independent claim(s) and verbosity and redundancy is avoided in order to achieve the conciseness in the structure and subject matter of the claim.

With regards to objection (4), the Applicant hereby submits an amended set of claims to include the technical advancement over the prior art as required under Section 2(1)(j) and under Section 2(1)(ja) of The Patents Act,1970 (as amended). Also, the support for the claims in the original specification is indicated in the response, as required under Section 10(4) of the Act by considering that requirements under Section 59(1) is met. Further, an additional copy of marked-up amendments (highlighting the amendments) as per Rule 14(2) of The Patents Rule, 2003 (as amended) is provided.

In light of the above amendments and submission, the Ld. Controller is humbly requested to withdraw the objection.

PART-III: FORMAL REQUIREMENTS

As regards to objections raised under part III of the FER, the Ld. Controller states as follows:

Objections	Comments
Requisite Fee (Application, RQ, Priority etc.) *The applicant should provide a break-up of fees in respect of forms, claims, pages of the complete specification on a separate sheet.*	The Applicant herewith submits a break-up of fees in respect of forms, claims, pages of the complete specification on a separate sheet.
Statement & Under Taking (Form 3 Details) *Fresh foreign filing details should be filed in Form-3 as per Section 8, Rule 12 of the act. Also, details regarding the search and/or examination report in respect of same or substantially the same invention filed outside India (if applicable) along with appropriate translation where applicable, should be submitted within a period of 6 months from the date of receipt of this communication as provided under Section 8(2) of The Patents Act, 1970 (as amended).*	The Applicant humbly submits and undertakes that that they have not filed any foreign application corresponding to the instant patent application till date. Since, Form 3 was already filed on 01/06/2020 with indication of NIL/NOT APPLICABLE foreign filing declaration and subsequently till date there is no foreign filing and so there is no update regarding foreign filing after Form 3 that was filed on 01/06/2020. A sort of waiver is requested for the instant objection.

In the view of above submission, we request the Learned Controller of Patents to waive off the objection of PART-III i.e. FORMAL REQUIREMENTS.

PRAYER

In view of the above submissions, we request you to kindly accept this application and proceed to grant a patent. Also, please let us know if we are required to comply with any further requirements. However, before

taking any adverse action, we humbly request the Controller of Patents to give the applicant an opportunity of being heard u/s 14 of the Indian Patents Act, 1970 via Video Conferencing.

We thank you in advance for your cooperation in this regard.

Yours faithfully,

Dated: 30/01/2022

Vikas Asawat
Patent Agent
INPA 1407
On Behalf of Applicant
Digitally Signed

Enclosure:

- **Amended Claims Marked Copy and Clean Copy**
- **Revised Specification Marked Copy and Clean Copy (After removing phrase "the spirit ")**
- **Fees Break up Sheet**