# RESPONSE TO FIRST EXAMINATION REPORT
# Patent Application No. 202011024533
# Via e-filing

**Controller of Patents : Ms. Rajni Bala**

**The Controller of Patents**
**Patent Office Branch**
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**Deadline to file response to First Examination Report:**

**February 27, 2022**

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| Indian Patent Application No. | : | 202011024533 |
| Date of Filing | : | 11/06/2020 |
| Title | : | AUTONOMOUS APPARATUS TO OPERATE ELEVATOR |
| Applicant | : | University of Petroleum and Energy Studies |
| *Date of FER* | : | 27/08/2021 |

Respected Madam,

We write in response to your office letter dated August 27, 2021.

Our response to the objections raised is as follows:

**Response to Objection Part II (1-2):**

Applicant notes that the claims of the present application have been held to lack novelty and inventive step in view of: D1: "A robot arm for pushing elevator buttons", W. Wang et al, Proceedings of SICE Annual Conference 2010, and D2: "Robot Button Pressing In Human Environments", Fan Wang et al, IEEE International Conference on Robotics and Automation (ICRA) 2018.

Applicant would like to traverse the Examiner's rejection below by pointing out several important differences between the present invention as claimed in the amended claims and those taught by the cited references. Applicant has amended the original independent Claim 1, to more clearly describe the present invention. The amended claims clearly distinguish the present invention from the cited references. In order to better illustrate some of the key elements of the present invention, amended claim 1 has been duplicated below,

*1. An autonomous apparatus (102) to operate an elevator (104), comprising:*

*a microphone (202)configured to receive a voice command from a user;*

*a command recognition unit (204) operable to recognize the voice command of the user;*

*a computational control unit (206) to process the voice command of the user using an inbuilt register of the command recognition unit(204);*

*an audio unit (208) operable to output a confirmation speech message in response to the voice command recognized by the command recognition unit (204), wherein the computational control unit (206) initiates a command signal pertaining to a button pressing mechanism;*

*a visual unit (210) configured to perform a visual search on a control panel of the elevator (104) based on the command signal received from the computational control unit (206) using an image processing technique, characterized in that: wherein the voice command pertains to one or more floor numbers of a building and various pre-stored messages such as to maintain social distancing, wear a mask, not to touch buttons in the elevator, and keep the elevator clean to stop the spread of viruses among elevator (104) users, wherein the computational control unit (206) matches the floor number received from the microphone (202) with the floor number recognized by the visual unit (210); and*

*a plurality of actuation units (212 and 110) to press a button on the elevator control panel based on the button pressing mechanism, wherein once the floor number is matched the actuation units are configured to press the button to move the elevator towards requested floor number.*

*The applicant respectfully submits that claims have been amended in respect of the section 2(1) (ja). The claims 8,9 and 10 has been merged with the independent claim 1 to lead towards the inventive step of the invention.* It is most respectfully submitted that it is a well settled principle of Patent Law that in order to challenge lack of novelty or inventive step of an invention, it is necessary to prove that the cited prior art documents unambiguously disclose separately (for alleged lack of novelty) or in combination (for alleged lack of inventive step) all the claimed features of the invention in a manner enabling a skilled person to carry it out. A document which merely refers to certain aspects of the field of invention or addresses a problem, similar to the one being solved by the claimed invention, cannot be considered as a relevant prior art for the purpose of challenging patentability, if not single example is provided therein for a solution to the problem. In order to establish anticipation/lack of novelty, a party is required to plead and show that each

and every feature as claimed in the challenged patent application was previously disclosed in its entirety in one single document in an enabling manner in as much as it is impermissible for a party to mosaic documents while alleging lack of novelty. Further, qua lack of inventive step, a party is required to establish that the claimed invention was obvious to a person skilled in the relevant art prior to the date of invention in view of the teachings of prior art documents which are clearly taught and enabled so that a person skilled in the art would have been able to arrive at the patented invention without any undue research and experimentation on his/her part.

The present invention provides an autonomous apparatus to operate an elevator. The present invention provides a human voice-controlled robot that can be installed inside and outside the elevator to operate the elevator buttons, communicates with a plurality of users and announces various pre-stored messages such as to maintain social distancing, wear a mask, not to touch buttons in the elevator, and keep the elevator clean to stop the spread of viruses (e.g. COVID) among elevator users. The present invention operates the buttons of the elevator by the plurality of actuation units to eliminate the manual contact with the buttons to stop the spread of viruses (e.g. COVID) among the users of the elevator. The present invention can be applied in various elevators which are installed in industries, schools/colleges, malls, hospitals, airports, etc. to reduce manual contact with the elevator buttons. Further, the present invention is economical, portable, and compact along with low operating power and it prevents the spread of surface adhering viruses such as COVID and will play an integral role in enhancing safety measurements in organizations. The present invention uses advanced visual search techniques and a highly precise actuator button pressing system that can be embedded externally in an elevator or lift to allow reliability of

operation and it allows audio feedback as per the user's voice command thus ensures correct execution of the voice command.

Document D1 discloses teaches a robot arm which is designed and set on the top of the wheeled robot, which can recognize the numbers or signs and push the buttons. There is a micro-camera set on the tip of the robot arm for image processing and pattern recognition. Then, inverse kinematics is used to calculate the angle of each link of the robot arm to press the desired button correctly. Integrating the techniques of image processing, pattern recognition, and motion control, the robot is implemented to achieve the elevator-button pushing task. D1 however fails to disclose an autonomous apparatus to operate an elevator.

In more particular, D1 discloses about pattern recognition, image recognition initiated through touch sensing in the robot, whereas the basis of the present invention is image recognition when initiated by speech. D1 discloses about arm robot consists of a camera and controller which runs on an algorithm that first recognizes the pattern and then the character before pressing a button moreover the paper never clarified which button will be pressed when the touch sensor initiates the robotic action, whereas the present invention discloses about arm robot consists of a camera, a mini-computer, a microphone that runs on the algorithm which first recognizes the correct number in speech and initiates the action of the arm, then recognizes the number through the camera and presses the button having that number which is a different mechanism than D1. The present invention discloses about generating control using voice command whereas D1 discloses about generating command using motion control and pattern recognition.

In view of above discussion and amended claims, it is clear that each and every element/features as set forth in the claimed invention is not

disclosed in D1. Therefore, subject matter as claimed in amended claims is novel over D1. In view thereof, please waive the objection.

Document D2 discloses teaches a SwitchIt robot accessory which is designed to operate a large number of switches and to be easily mounted on a mobile robot platform. Setting up the system for use in a new environment requires a human to first perform a calibration procedure, which involves affixing QR codes to button panels and annotating reference models of the panels using a hand-held tablet. Afterwards, the system will autonomously recognize any visible panel, suggest a reference position for the robot's base, and once in position, press a requested button or sequence of buttons. D2 however fails to disclose or suggest an autonomous apparatus to operate an elevator.

In more particular, the present invention discloses about an independent robot i.e. human voice-controlled robot name which is to be installed inside and outside of the elevator and operate according to voice instruction such as a human voice-controlled robot which will process on human voice and search for requested floor button using image recognition through camera attached on an actuator system unit and initiate actuator system to press the buttons in the elevator, whereas D2 fails to disclose about the voice controlled independent robot and rather discloses about affixing QR codes to button panels and annotating reference models which is different from the present invention. D2 discloses that the user affixes a QR code on or near the button panel and by using a tablet with an attached RGB-D camera, the user takes a picture of the panel and provides an identifier for the panel, guided by the annotation GUI, the user adds each button by name, types, and designates areas of interest on the picture. The panel identifier, QR code, RGB-D information, button names, type, location, size, and areas of interest are

saved to a database, whereas the present invention discloses about listening to voice commands by the elevator's users whether inside or outside of the elevator, recognizing elevator buttons and for this camera attached with the actuator system which will identify the image of the number spoken by the passenger and once the number is identified it will be pressed by the actuator system. The input provided by the passenger will only be the floor number. This is done to complete the process faster and also to make the system easier. Thus, the above-mentioned process is different from D2.

As D1 and D2 fail to disclose or suggest the amended features of claim 1, the subject matter as claimed cannot be held to lack inventive step in view of the cited documents. Thus, the subject matter as claimed in amended claim 1 is novel over D1 and b inventive over D1 and D2 either alone or in any combination thereof. Keeping in view the above, Applicant humbly requests for reconsideration and waiver of the aforesaid objection.

**Response to Objection Part II (5):**

1) The amended claims have been characterized in two-part form to lead towards the inventive step of the invention using the phrase "characterized in that".

2) Revised specification has been prepared by eliminating the clerical errors. Revised specification is being submitted herewith.

3) The preamble of the originally filed claims is clearly described and matches with the title of the invention. Therefore, the objection stands moot.

4) The novel and inventive step of the invention has been characterized to lead towards the inventive step of the invention.

5) The last paragraph implies that the embodiments of the present invention showcase an example of the invention which lies within the scope of

the invention but is not limited to the example. There may be different examples claiming the same protection of the present invention and falls within the scope of the amended claims. Therefore, the objection stands moot.

6) The term "according to" in the originally filed claim has been replaced by "as claimed in claim" in the amended specification.

Keeping in view the above, Applicant humbly requests for reconsideration and waiver of the aforesaid objection.

**Response to Objection Part II (6):**

With regards to the section 2(1)(ja): All essential inventive features have been included in the amended claim 1 and claim1 has been characterized in order to define the inventive step of the present invention in respect of the document D1 and D2.

With regards to the section 10(4): The complete specification fully and particularly describes the invention u/r section 10(4) of The Patents Act, 1970. For instance, the following figures and their corresponding description clearly describes the invention: FIG. 1 illustrates an implementation view of an autonomous apparatus to operate an elevator; FIG. 2 illustrates a block diagram of the various components of the present autonomous apparatus to operate an elevator; FIG. 3 illustrates a schematic view of the plurality of actuation units. The applicant has further stated that the operation details are disclosed on Page 11-14 of the original filed specification.

With regards to the section 59(1): Claims are fully supported by original specification and within the scope of original claims and specification, hence should be allowed. Mark up copy of amended claims is being submitted herewith.

Keeping in view the above, Applicant humbly requests for reconsideration and waiver of the aforesaid objection.

**Response to Part III- Formal Requirements:**

Applicant submits the following to comply with the above objection:

1) 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 11/06/2020 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 11/06/2020. It is requested to waive of this objection in light of above submission. The objection related to Section 8(2) and Rule 12(3) stands moot.

2) A Self attested copy of the GPA with the prescribed stamp duty for the current application has been submitted vide e –filing. A sort of waiver is requested for the instant objection. A sort of waiver is requested for instant objection.

3) The as submitted forms and documents have been duly signed by the registered patent agent. A sort of waiver is requested for instant objection.

In view of the above and the documents enclosed, it is requested that the Objections of Part III shall be waived.

With the above, the Applicant believes that all the objections contained in the FER are appropriately addressed and hence, humbly pray for early grant of the Application. In the event the decision of the learned Controller of Patents

is adverse to the Applicant, we humbly request that the Applicant be given an opportunity to be heard as per the provisions of Section 14 of the Indian Patents Act, 1970.

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

Yours faithfully,

**Dated: 17/01/2022**

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

**Enclosure:**
Amended Claims Marked Copy and Clean Copy