Title of Invention : Industrial IoT and Machine Learning-based Digital Twin for Object Segregation
Name of the Applicant : Arifuddin Sohail & Others
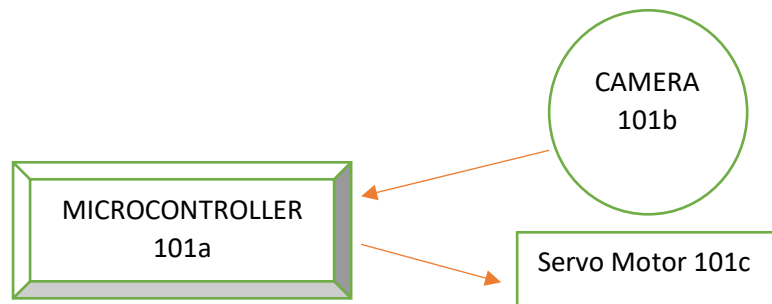**Application No** : Page **1** of **3**

FIG 1

FIG-2 101 Component layout of Object Identification Device (OID)

Dr. Mohammed Arifuddin Sohel
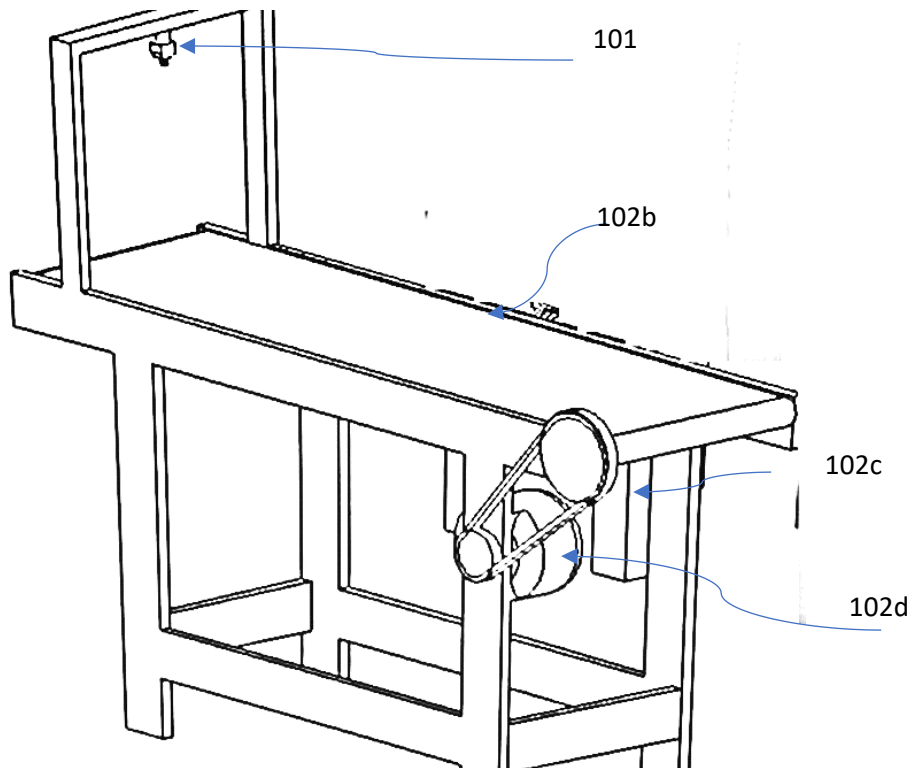
Syed Imran Ahmed

Shaista Fatima

Mohammed Shahed Ali Haqqani

Title of Invention : Industrial IoT and Machine Learning-based Digital Twin for Object Segregation
Name of the Applicant : Arifuddin Sohail & Others
Application No :   Page **2** of **3**

FIG -3 102 Component Architecture Of Smart Conveyor Platform (SCP-102)

Dr. Mohammed Arifuddin Sohel

Syed Imran Ahmed

Shaista Fatima

Mohammed Shahed Ali Haqqani

Title of Invention   :   Industrial IoT and Machine Learning-based Digital Twin for Object Segregation
Name of the Applicant :   Arifuddin Sohail & Others
Application No   :   Page **3** of **3**

Step 401 :   Microcontroller 101a initialises the system and aline the camera 101b in HV-020 by adjusting the servo-mechanism embedded in IOD 101.

Step 402 :   Microcontroller 101a executes relevant MLA and DLA on Video Images 101b-1 to identify the approximate quantity of objects 108 piled up in the storage place.

Step 403 :   Microcontroller 101a updates the value in its digital counterpart DT-104 and executes relevant MLA on Video Images 101b-1 to predict the speed 109 at which the conveyor MCM 102c is to be set. (The set speed is based on either criterion set by the user through its digital counterpart DT-104 or the predicted outcome of the relevant MLA.)
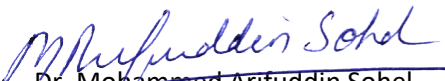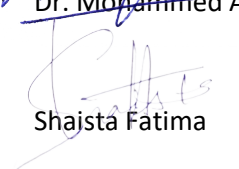
Step 404:   Microcontroller 101a updates the speed in DT-104 via WCC 105 and sends the appropriate command to SRU-102c.
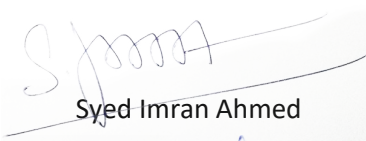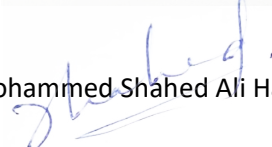
Step 405 :   OID 101 is positioned   HV 010 onto the conveyor 102 and start the MCM 102d.

Step 406:   OID 101 detects the object by performing relevant MLA and DLA on video images 101b-2 and send the appropriate command to SM 103.

Step 407 :   Based on the object, time and speed to sort, SM 103 moves RA 103a to perform the relevant act of sorting. In step 408, microcontroller 101a communicates with DT 104 to update the status and verify for further instructions.

400 Process executed in Industrial IoT and Machine Learning-based Digital Twin for Object Segregation

Dr. Mohammed Arifuddin Sohel   Syed Imran Ahmed

Shaista Fatima   Mohammed Shahed Ali Haqqani