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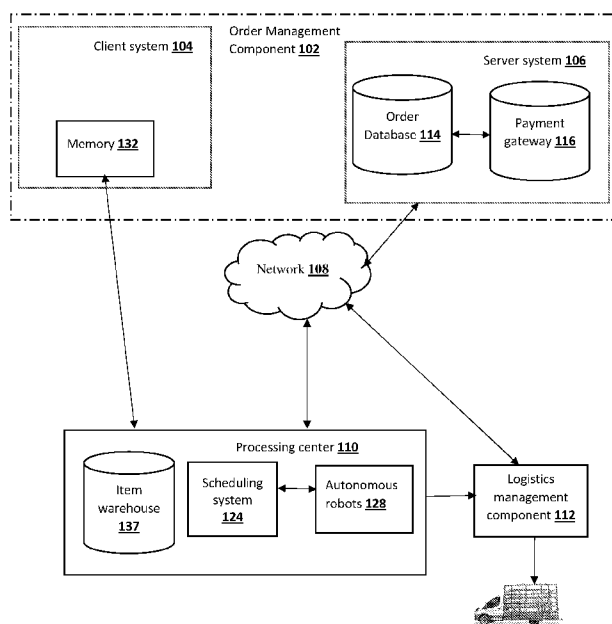


FIG. 1

(57) Abstract: A system for order management and distribution for glass panels or sheets is disclosed. The system comprises a client system, a server system, a processing center and a logistics management component. The client system is configured to display list of items information through a user interface thereof. The client system generates a customer ID and a purchase request in response to the user selections. The server system receives the purchase request and generates an order ID. The server system transmits the order ID to the processing center. The processing center comprises an order scheduling system present at the distribution center to receive the order ID. The order scheduling system communicates with one or more autonomous robots to automate operations such as loading, unloading, and processing of glass. Further, the order scheduling system ships processed items and update shipping status to customer.



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## AN ORDER MANAGEMENT AND DISTRIBUTION CENTER

### Technical Field

[0001] The present disclosure relates generally to glass distribution, and particularly, relates to a system for order management and glass distribution.

### BACKGROUND

[0002] Currently, the Glass distribution occurs only from glass factories. Hence, the glass distribution takes about one-two weeks to reach locations which are located far away from the factories. Further, the factories dispatch glass orders in bunch of 12 to 40 pieces. The customer does not have a provision to select smaller numbers (less than 10) of glass. Also, the factories produce jumbo size glasses in the size range of 5000mm by 3000mm. There is no provision for processing glass based on requirements of the customer. Further, the customer does not have a provision to select a batch of glass with a mix of different types of glass.

[0003] Also, existing warehouses typically process glass manually using labor force. The warehouses store jumbo glasses in bulk and cut the glasses in pre-determined sizes. Thereafter, cut glasses are stored in warehouse for shipping and delivery using manual labor. Most of the operations, such as loading, unloading, require manual intervention. Further, the warehouses do not provide a mechanism that sorts, processes and store glass automatically based on customer requirements. Also, the time required to ship glass from a warehouse to customer locations is typically 7-14 days.

[0004] Currently, wholesalers purchase jumbo size glass from factories and cut the glass manually into standard sizes, for example, 4880mm, 3660mm. Thereafter, the cut glass is transported from wholesalers to customers who are located miles away by packaging using wood, thereby preventing breakage of glass. Thus, the distribution of glass from wholesalers to customers becomes costly with excess usage of wood. Further, the cutting of glass in standard size or pre-determined sizes will cause lots of wastage due to variations in customer needs and the dimension of the standard or pre-determined sizes. Thus, we require a localized system that is equipped to accurately cut and process glasses based on the customer requirements, and thereby reduce the need for wood in packaging and further reduces the wastage of glass.

**[0005]** A prior art JP2007265153 teaches a glass plate product management delivery system to ensure quick deliveries. The system includes GPS, camera, a shipment management device to update the delivery information to customers. However, the prior art is limited to managing logistics and delivery information and does not address the issues related to order management and order processing. Further, the prior art does not provide a platform for placing glass orders that the glass can be processed based on customer requirements.

**[0006]** Another prior art JP2006076794 teaches a system for shipping and distributing double glazing glass products produced according to customers' requirements so that customers can reduce space required for storage and sorting. The system discloses a server computer, a glass cutting machine, a computer processing machine. The server computer receives data about production order, which is subsequently fed to the glass cutting machine. The glass cutting machine cuts the glass in a predetermined pattern and the cut glass is sent directly to logistics for shipping. The disclosed prior art is directed at eliminating the stocking of processed glass. However, the prior art does not teach about providing a platform for placing glass orders that the glass can be processed in varying sizes and types based on customer requirements.

**[0007]** Hence, we require a glass distribution system that will improve the serviceability, and delivery time. Further, there exists need for a glass distribution system that will provide flexibility of glass type selection to customer's and further process the selected glass based on customer requirements. Furthermore, there exists need for an integrated order management and glass distribution system that caters to automating the entire cycle of order management, order processing, and shipment.

**[0008]** Other features and aspects of this disclosure will be apparent from the following description and the accompanying drawings.

### Summary

**[0009]** The present invention proposes a glass distribution system that will improve the serviceability, and delivery time of glass items. Further, the present invention discloses a glass distribution system that will provide a customer flexibility for selecting various types, size and quantities of glass for shipment. The glass distribution system processes glass orders automatically based on customer requirements. Furthermore, the present invention discloses an order

management and glass distribution system that caters to automating the entire cycle of order management, order processing, and shipment.

**[0010]** A system for order management and distribution for glass panels or sheets is disclosed. The system comprises a client system, a server system, a processing center and a logistics management component. The client system is configured to display list of items information through a user interface thereof. The client system is further configured to generate a customer ID in response to customer information received from the user interface. The client system is further configured to receive one or more user selection and parameters associated with the item. The client system is further configured to transmit a purchase request in response to the user selections along with customer ID to a server system. The server system configured to receive the purchase request and generate an order ID. Thereafter, the server system transmits the order ID to the processing center for processing the order ID and distributing the items associated with the order ID. The processing center comprises an order scheduling system present at the distribution center to receive the order ID. The order scheduling system comprises a processor communicating with one or more autonomous robots and is configured to automate operations such as loading, unloading, and processing of glass. The order scheduling system is further configured to determine the specifications of items associated with the order ID and process one or more rack of items to comply with the specifications. Thereafter, the order scheduling system automatically store the sorted items for distribution using robots and update order shipping status in a logistics management component coupled to the order scheduling system. The one or more autonomous robots of the order scheduling system is also configured to automatically retrieve one or more type of items based on the specifications present in the order ID.

**[0011]** According to an embodiment of the present invention, the client system includes an identifier, a display component, an ordering component, a payment component. The identifier identifies a customer using credentials. A display component displays information identifying the item. The display component communicates with the Item warehouse to retrieve a list of types of Glass, and specifications of glass types. The list of items that is displayed is updated in real-time basis in the Item warehouse based on a stock available at the processing center. An ordering component receives selection of items by a user through the display component, and consecutively transmits a purchase request to a server system to 'order' the identified item. The payment component initiates payment for the purchase request by communicating with a payment gateway

present in the server system. The payment component is configured to receive user credentials, and user payment information.

**[0012]** According to an embodiment of the present invention, a method of order management and distribution is disclosed. The proposed method enables a customer to select desired list of glass items from a client system for speedy processing and delivery. The method includes displaying a list of items information through a user interface of a client system. A customer ID is generated in response to customer information. The customer ID comprises embedding information such as Owner name, Firm name, Mobile, Email, Address, GST and PAN Number into a six-digit code. Thereafter, one or more user selection and parameters associated with the item is received. On receiving user selection, a purchase request is generated by the client system and send to the server system. The purchase request is processed by the server system after verifying the user and receiving payment from the user. Once the purchase request is processed, an order ID is generated by the server system. The server system transmits an invoice along with the order ID to the client system. Further, the server system maps the order ID with a nearby processing center (Glass distribution center) for order processing and distribution.

**[0013]** An order scheduling system in the processing center receives the order ID. Further, the specifications of items associated with the order ID is determined by the order scheduling system. The specifications for the order ID comprises item category, thickness, length, width and quantity of item. The order scheduling system automatically processes one or more rack of items by robots to comply with the specifications. Thereafter, the one or more processed items by robots are automatically stored based on the order ID. The items are stored in a storage area of the processing center for packing and distribution by the logistics management component. The items are packed based on packaging requirements. The shipping status is updated to a customer by a logistics management component.

**[0014]** Other features and aspects of this disclosure will be apparent from the following description and the accompanying drawings.

#### Brief Description of the Drawings

**[0015]** Embodiments are illustrated by way of example and are not limited in the accompanying figures.

[0016] FIG. 1 illustrates a block diagram for order management and distribution for glass panels or sheets, according to an embodiment of the present invention;

[0017] FIG. 2A illustrates a detailed block diagram of the client system present in the order management system;

[0018] FIG. 2B illustrates a detailed block diagram of the processing center;

[0019] FIG. 3 is a flowchart illustrating a method of order management and distribution; and

[0020] FIG. 4 illustrates an exemplary user interface present in the client system.

[0021] Skilled artisans appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the invention.

#### Detailed Description

[0022] The present invention is now discussed in more detail referring to the drawings that accompany the present application. In the accompanying drawings, like and/or corresponding elements are referred to by like reference numbers.

[0023] The shortcomings discussed in the background section are addressed by an improved Order management and Distribution Centre located at all supply locations. The Order management and Distribution Centre is configured to seamlessly service large sets of orders within a short period of time frame (typically 24 hours). The order management component is configured to receive orders from customers through a network, wherein the orders correspond to varying types of glass. Thereafter, the order management component generates an order ID and maps the order ID with a nearby distribution center. The distribution center receives jumbo size glass from manufacturing plants. Subsequently, the distribution center is designed to cut and process glass in varying sizes automatically using autonomous robots based on the order ID. Further, the distribution center also automates the process of loading and unloading glass, and storing glass for shipments.

[0024] Further, the Distribution Centre is communicatively coupled with a logistics management component, that effectively packs the processed glass in loose sheets with metal crates. Thus, the proposed system eliminates the need for large amounts of wood required in packing and logistics, thereby saving costs. Further, customer orders are fulfilled efficiently and

the processed glass and glass products is delivered in good condition without breakage. Furthermore, the logistics component present in the Order management and Distribution Centre provides intimation about shipping status to customers.

**[0025]** FIG. 1 illustrates a block diagram for order management and distribution for glass panels or sheets, according to an embodiment of the present invention.

**[0026]** According to an embodiment of the present invention, a client system 104 is configured to display list of items information through a user interface thereof. Thereafter, a customer ID in response to customer information received from the user interface is generated. The customer ID is generated after the customer addition request is approved by the credit controller. The customer ID includes a 6-digit customer code. The customer ID comprises embedding information such as Owner name, Firm name, Mobile, Email, Address, GST and PAN Number into a six-digit code. In an example, when the customer registers with customer information, an activation link is sent to the mobile of the customer to authenticate the customer.

**[0027]** The client system 104 communicates with an Item warehouse 137 to retrieve information about multiple products and the specifications/parameters associated with the products. The parameters include category, Product type, Thickness, Length, Width & no. of sheets. Further, the customer is enabled to select the servicing location as ‘Glass Distribution Centre’ on the client system. The servicing location or the Glass Distribution Centre is selected based on its proximity to the client system 104. The client system 104 enables the customer to select one or more products with specific parameters. On selection of products, the purchase request initiated by the customer is transmitted to the server system 106 over a network 108.

**[0028]** The server system 106 is configured to store information corresponding to the purchase request received from the client system in an order database 114. The server system 106 also communicates with a payment gateway 116 to process payments for the purchase request. On confirming payment associated with the purchase request, an Order ID is generated. The Order ID includes information about the customer ID along with the category, product, thickness, length, width and quantity selected by the customer. The order ID is transmitted over the network 108 to the processing center 110.

**[0029]** The processing center 110 is configured to process the order ID and distribute the items associated with the order ID. The processing center 110 further includes an order scheduling system, a processor, a memory, and a storage area. The processing center, also known as glass

distribution center is configured to instruct the autonomous robots to cut, grind, and sort one or more types of glass according to the requirements mentioned in the Order ID. Some embodiments of the present disclosure further include a control system that is operable to cause a particular inventory item to be picked from the inventory storage and to be routed (e.g., via the conveyor mechanism) to the processing area.

**[0030]** In an example, the processing center 110 is configured to accommodate the jumbo glass in size of 4880mm, 3660mm and cut them into various sizes including but not limited to 8ft by 3ft, 8ft by 3.25ft, 8ft by 3.5ft, 8ft by 3.75ft, 8ft by 4ft, 8ft by 4.5ft, and 8ft by 5ft.

**[0031]** According to an embodiment of the present invention, the scheduling system 124 is configured to determine the specifications of items associated with the order ID. Further, one or more rack of items is processed to comply with the specifications. The processing operations comprising cutting, grinding, tempering, lacquering, mirroring, laminating operations. For processing, one or more items from a rack of items is processed based on the specifications mentioned in the order ID. Thereafter, one or more processed items is automatically sorted based on the order ID and stored in the storage area by autonomous robots. The scheduling system 124 communicates the list of items stored in the storage area with the logistics management component 112 to perform packing and distribution of items.

**[0032]** The logistics management component 112 is configured to pack the stored items based on packaging requirements. The packaging requirements for glass includes arranging loose sheets of glass along a metal frame support. Further, the packages are shipped to a proximal geographical area associated with the order ID using a transportation means. The logistics management component is designed so that order items shipments is fulfilled in one or two working days from the processing center. Once, the order items corresponding to the order ID is successfully dispatched, the notification about the shipment status is sent to customer.

**[0033]** According to an embodiment of the present invention, the item is a one of a clear glass, a tinted glass, a coated glass, a reflective glass, a planilaque, a window or a façade.

**[0034]** FIG. 2A illustrates a detailed block diagram of the client system 102. According to an embodiment of the present invention, the client system includes an identifier 138, a user interface 133, an ordering component 135, a payment component 136. The identifier 138 identifies a customer using credentials. A user interface 133 displays information identifying the item. The user interface 133 present on an electronic device communicates with the Item warehouse to

retrieve a list of types of Glass, and specifications of glass types present in the processing center. The list of items that is displayed is updated in real-time basis in the Item warehouse based on a stock available at warehouse of the processing center. An ordering component receives selection of items by a user through the display component. In an example, the user selects the category, type of product, thickness, length, width and quantity of items in the user interface. The selected items are confirmed with the customer by using a “Confirm” option. The user is also enabled to add and remove items from the selected items. Once, the user confirms the purchase of selected items, the user is enabled to enter shipping details. Further, the user interface provides an option to make payment and confirm the order. Based on the confirmation of the order, a request is transmitted to the server system.

**[0035]** The server system 106 places an ‘order’ for the identified item. The payment component 136 initiates payment for the purchase request by communicating with a payment gateway present in the server system. The payment component 136 is configured to receive user credentials, and user payment information. Further, the payment component 136 transmits a payment confirmation link to the client system. The payment component 136 also verifies and authenticates user credentials using one of password, biometric and the like. Once the user accepts the payment confirmation link, the payment confirmation is approved by the payment gateway. On confirmation of payment from the user, the payment component 136 generates an invoice corresponding to the payment confirmation. The invoice also includes the items and quantity selected by the user.

**[0036]** **FIG. 2B** illustrates a detailed block diagram of the processing center 110. The processing center 110 includes an item warehouse 120, a loading component 122, a scheduling system 124, an unloading component 126, autonomous robots 128, and a cutting component 132. The processing center 110 is configured to automate the entire cycle of order management, order processing, and shipment without manual intervention. Thus, the processing center 110 improves the speed of order processing and shipment as compared to a typical factory or warehouse using one or more autonomous robots 128. Further, the processing center 110 streamlines the order retrieval, storing and dispatch process in a more efficient manner with a plurality of autonomous robots.

**[0037]** In some embodiments, the processing center 110 may include a pick-up apparatus that is configured to pick-up items from the item warehouse 120. In some cases, the inventory items may be received by the router module via conveyance receptacles (e.g., totes, bins) that are conveyed using a conveyor mechanism, where the conveyance receptacles are not fixed to the conveyor mechanism.

**[0038]** According to an embodiment of the present invention, the processing center 110 receives bulk of jumbo size glasses from factories, which are further stored in the Item warehouse 120. The scheduling system 124 present in the processing center 110 receives the order ID from the server system (not shown in Fig). In accordance with the order ID, the scheduling system 124 communicates with the autonomous robots 128 to retrieve one or more types of glass items from different racks (based on the specifications mentioned in the order ID) of the item warehouse 120. Thereafter, the autonomous robots 128 loads the one or more types of glass items onto the loading component 122. Subsequently, the autonomous robots 128 control the processing of the glass in the cutting component 132, where one or more glass items are cut in sizes mentioned in the Order ID. After cutting, the autonomous robots 128 transfer the cut glass items to an unloading component 126. The unloading component 126 along with the autonomous robot's sorts and stores the cut glass items based on the order ID in a shipment warehouse 130. The cut glass items stored in the shipment warehouse 130 are packed in a rack based on the Order ID. Later, the packed items from the shipment warehouse 130 are transferred to the logistics management component 112 for shipping. Since the processing center cuts glass items into smaller sizes, the packaging does not require conventional wooden boxes. The packaging requirement for cut glass includes arranging loose sheets of glass along a metal frame support. Further, the processing center 110 is configured to service bulk orders and dispatch to customer locations in one to two days, since the entire process is automated. In various instances, it should be understood that references to autonomous robots 128 may be extended to any machine, apparatus, device, conveyor system or pick-up mechanisms that can automatically or semi-automatically implement the aforesaid loading, processing, unloading and sorting operations.

**[0039]** It should be noted that, the processing center 110 may also include a plurality of processing modules or robots or apparatus that may be configured to perform operations such as cutting, grinding, tempering, lacquering, mirroring, or laminating. In some instances, the processing modules may receive the inventory items via conveyance receptacles that are conveyed

using the conveyor mechanism. In some cases, the processing area may also include a shipping module that is configured to receive packaged inventory items from various ones of the processing modules.

**[0040]** According to an embodiment of the present invention, the processing center 110 is configured to perform grinding, tempering, lacquering, mirroring, or lamination based on the specifications mentioned in the order ID. Also, the processing center is configured to process at least one of a clear glass, a tinted glass, a coated glass, a façade, a DGU, a TGU. The processing center can also be configured with autonomous robots or machines to process glass to automatically form a window framing, window assembly with spacers and sealants.

**[0041]** **FIG. 3** is a flowchart illustrating a method of order management and distribution. The proposed method enables a customer to select desired list of glass items from a client system for speedy processing and delivery. The method includes displaying a list of items information through a user interface of a client system (301). A customer ID is generated in response to customer information (302). The customer ID comprises embedding information such as Owner name, Firm name, Mobile, Email, Address, GST and PAN Number into a six-digit code. Thereafter, one or more user selection and parameters associated with the item is received (303). On receiving user selection, a purchase request is generated by the client system and send to the server system (304). The purchase request is processed by the server system after verifying the user and receiving payment from the user. Once the purchase request is processed, an order ID is generated by the server system (305). The server system transmits an invoice along with the order ID to the client system. Further, the server system maps the order ID with a nearby processing center (Glass distribution center) for order processing and distribution (306).

**[0042]** A scheduling system in the processing center can receive the order ID (307). Further, the specifications of items associated with the order ID is determined by the order scheduling system (308). The specifications for the order ID comprises but not limited to item specifications, category, thickness, length, texture, coating, size, width and quantity of item. The order ID can additionally include information corresponding to the specifications such as glass texture, grinding pattern, mirroring pattern, window assembly specifications, lacquering pattern, and the like. The order scheduling system automatically processes one or more rack of items by robots to comply with the specifications (309). Thereafter, the one or more processed items by robots are automatically stored based on the order ID (310). The items are stored in a storage area of the

processing center for packing and distribution by the logistics management component. The items are packed based on packaging requirements. The shipping status is updated to a customer by a logistics management component. It should be understood that the order ID may include additional details that specify the characteristics of the glass and the processing required, for example specifications corresponding to the grinding, tempering, lacquering, mirroring, laminating, coating. Furthermore, the order ID includes details that specify if a DGU, TGU, or a window framing, shower cubicle using glass is required.

**[0043]** According to an embodiment of the present invention, the processing line is equipped with a Cutting component 132 comprising a scoring device and an edge deletion device. Based on the inputs fed to these devices, optimization for minimal glass wastage is performed and accordingly the scoring of glass substrates is performed. The scoring device creates a weak point on the glass substrates. In additional aspect of the embodiment, the edge deletion is performed using a grinding wheel coupled with a suction system to eliminate dust. The glass substrate is then carried to the unloading table in the processing line, where a crew stationed manually snaps the glass at the scored area resulting in cut glass. The cut glass (often referred to as child sizes) are then unloaded manually or, using a vacuum sucker based on the size of the glass and placed on stillage's.

**[0044]** According to another embodiment of the present disclosure, the processing line includes glass-tempering furnaces. In glass tempering, the tempered or hardened glass are produced by heating the glass substrates to a temperature of above 500 degrees Celsius, where they begin to soften. The external surfaces are then rapidly cooled, creating a strong compression effect. Using the proposed invention, the glass child sizes are automatically passed through a conveyor belt through the furnaces to heat the glass child sizes.

**[0045]** The processed glass pieces can be picked up by the autonomous robots 128 in the processing line based on the customer order, for example for applications ranging from shower cubicle, window etc. One or more pieces of processed glasses are picked up by the autonomous robots 128 and further cut and shaped into different sizes. The one or more pieces of glass are assembled together with accessories to form a package for a shower cubicle or window. For example, the glass pieces are cut in "U" shape or "L" shape to affix accessories such as handle.

**[0046]** FIG. 4 illustrates an exemplary user interface present in the client system. The interface provides item information retrieved from the Item warehouse in a warehouse management. Further, the user interface also displays the 'Orders' received from the user along with the invoices/receipts in 'Stock transfers'. The customer interfaces update the production and processing details in the 'Production/planning'. The customer interfaces also display the shipping status of the orders.

**[0047]** According to an exemplary embodiment of the present invention, a customer logs into a user interface of the client system. Through the user interface the customer is enabled to select 'Product' from a plurality of products available at the distribution center. Further, the customer selects criteria's including but not limited to glass specifications, category, Product, Thickness, Length, Width and no. of sheets. The user interface will also enable the customer to select at least one of a window assembly, a DGU formation, a TGU formation to be manufactured using a specific type of glass. The selected products are added to the cart of the customer. Once the customer places an order for the selected products, a purchase request is sent to the server system. On receiving the purchase request, a payment link is generated by the server system, which is communicated to the user interface on the client system. Once the user accepts the payment link and confirms the payment with payment details, which are further communicated to the server system. On receiving payment confirmation, the server system generates an Order ID and transmits the same onto the client system. The Order ID is transmitted also communicates with a payment gateway to process payments for the purchase request. On confirming payment associated with the purchase request, an Order ID is generated. The Order ID includes information about the customer ID along with the category, product, thickness, length, width and quantity selected by the customer. The order ID is transmitted over the network to the processing center.

**[0048]** It is to be understood that the exemplified mentioned in Order ID can be extended to include any information corresponding to down-stream processes involved in glass, for example, glass texturing, attaching glass accessories, DGU specifications, shower cubicle, TGU specifications, window assembly specifications and the like.

**[0049]** Advantageously, the present invention allows the customers to have a seamless and improved delivery time (70 percent faster) compared with the conventional means of delivering glass products, improved serviceability, and better size availability. Further, the proposed system provides lean distribution of glass and glass products and better size availability.

**[0050]** The invention will be further described by the following specific examples. It will be understood, however, that although these examples may have described in detail certain preferred operating conditions of the invention, they are given primarily for purpose of illustration only and the invention in its broader aspects is not limited thereto. Note that not all of the activities described above in the general description or the examples are required, that a portion of a specific activity may not be required, and that one or more further activities may be performed in addition to those described. Still, further, the order in which activities are listed is not necessarily the order in which they are performed.

**[0051]** Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any feature(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature of any or all the claims.

**[0052]** The specification and illustrations of the embodiments described herein are intended to provide a general understanding of the structure of the various embodiments. The specification and illustrations are not intended to serve as an exhaustive and comprehensive description of all of the elements and features of apparatus and systems that use the structures or methods described herein. Certain features, that are for clarity, described herein in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features that are, for brevity, described in the context of a single embodiment, may also be provided separately or in a sub combination. Further, reference to values stated in ranges includes each and every value within that range. Many other embodiments may be apparent to skilled artisans only after reading this specification. Other embodiments may be used and derived from the disclosure, such that a structural substitution, logical substitution, or another change may be made without departing from the scope of the disclosure. Accordingly, the disclosure is to be regarded as illustrative rather than restrictive.

**[0053]** The description in combination with the figures is provided to assist in understanding the teachings disclosed herein, is provided to assist in describing the teachings, and should not be interpreted as a limitation on the scope or applicability of the teachings. However, other teachings can certainly be used in this application.

**[0054]** While aspects of the present disclosure have been particularly shown and described with reference to the embodiments above, it will be understood by those skilled in the art that various additional embodiments may be contemplated by the modification of the disclosed machines, systems and methods without departing from the spirit and scope of what is disclosed. Such embodiments should be understood to fall within the scope of the present disclosure as determined based upon the claims and any equivalents thereof.

LIST OF ELEMENTS

- 110 Processing center
- 120 Item warehouse
- 122 Loading component
- 124 Scheduling system
- 126 Unloading component
- 128 Autonomous robots
- 132 Cutting component
- 108 Network.
- 106 Server system
- 104 Client system
- 102 Order Management Component
- 112 Logistics management component
- 130 Shipment warehouse

**CLAIMS**

1. A system for order management and distribution for glass panels or sheets, the system comprising:
  - a client system 104 configured to:
    - display list of items information through a user interface thereof;
    - generate a customer ID in response to customer information received from the user interface 133;
    - receive one or more user selection and parameters associated with the item;
    - send a purchase request in response to the user selections along with customer ID to a server system 106;
  - the server system 106 configured to receive the purchase request and generate an order ID;
  - a processing center 110 communicatively couple to the server system 106 over a network 108, wherein the processing center 110 is configured to receiving the order ID from the server system 106 and process the order ID and distribute the items associated with the order ID, and the processing center characterized by an order scheduling system 124 present at the distribution center to receive the order ID, wherein the order scheduling system comprises a processor 131 communicating with one or more autonomous robots 128 and is configured to:
    - determine the specifications of items associated with the order ID;
    - select items matching specifications of order ID automatically to a processing line;
    - process one or more items in the processing line to comply with the specifications;
    - unload processed items automatically from the processing line to a storage area;
    - automatically sort one or more items based on the order ID for distribution and thereafter trigger a logistics management component coupled to the order scheduling system.

2. The system as claimed in claim 1, wherein one or more autonomous robots 128 of the scheduling system 124 is also configured to automatically retrieve one or more type of items based on the specifications present in the order ID.
3. The system as claimed in claim 1, the client system 104 comprising:
  - an identifier 138 that identifies a customer using credentials;
  - a user interface 133 component for displaying information identifying the item;
  - a ordering component 135 that in response to selection of items by a user, sends a request to a server system to order the identified item,
  - a payment component 136 for initiating payment for the purchase request by communicating with a payment gateway.
4. The system as claimed in claim 1 and 3, wherein the payment component 136 is configured to confirm payment from the user; and generate an invoice corresponding to the payment confirmation.
5. The system as claimed in claim 1, wherein the autonomous robot 128 performs processing operations comprising one or more operations selected from group consisting of cutting, grinding, tempering, lacquering, mirroring, laminating, window framing, shower cubicles forming, or combinations thereof.
6. The system as claimed in claim 1 and 5, wherein the specifications for the order ID comprises item category, thickness, length, width, quantity of item, and accessories related to the item.
7. The system as claimed in claim 2 and 6, wherein the user selections and parameters associated with the item include quantity, category of item, dimensions of item, shipping address, and shipping date.

8. The system as claimed in claim 1, wherein the logistic management component 112 is configured to:
  - pack the items from the storage area based on packaging requirements;
  - determine packaging status of the items;
  - in response to receiving packaging status, allocating a shipping address to the package, where the shipping address has a proximal geographical area associated with the order ID;
  - loading the packages on a vehicle by automated robots for shipment;
  - in response to shipment, notify the status of the package to the customer.
9. The system as claimed in claim 1 and 8, wherein the packaging requirements for glass comprises arranging loose sheets of glass on a vehicle along a metal frame support.
10. The system as claimed in claim 1, wherein the item is a one of a clear glass, a tinted glass, a coated glass, or a façade.
11. The system as claimed in claim 1, wherein autonomous robot performs processing operations comprising assembly of one or more glass items and related accessories for forming shower cubicle and window assembly.
12. A method for order management and distribution, the method comprising:
  - displaying a list of items information through a user interface of a client system;
  - generating a customer ID in response to customer information;
  - receiving one or more user selection and parameters associated with the item;
  - sending a purchase request in response to the user selections along with customer ID by the client system to a server system;
  - generating an order ID by the server system in response to the purchase request and generate an order ID;
  - mapping the order ID with a nearby processing center for order processing;
  - receiving the order ID by the order scheduling system present at the distribution center;

determining the specifications of items associated with the order ID by the order scheduling system;

automatically processing one or more rack of items by robots to comply with the specifications; and

automatically storing one or more processed items by robots based on the order ID, and thereafter updating shipping status in a logistics management component.

13. The method as claimed in claim 12, wherein the step of generating a customer ID comprises embedding information such as Owner name, Firm name, Mobile, Email, Address, GST and PAN Number into a six-digit code.

14. The method as claimed in claim 12, wherein the list of items is displayed and updated in real-time based on a stock available at a distribution center.

15. The method as claimed in claim 12, wherein automatically processing one or more rack of items by robots comprises selectively cutting one or more items from a rack of items based on the specifications.

16. The method as claimed in claim 12 and 13, wherein the specifications for the order ID comprises item category, thickness, length, width and quantity of item.

17. The method as claimed in claim 12 and 13, wherein the step of automatically storing the sorted items for distribution also comprises:

packing the stored items based on packaging requirements;

shipping packages to a proximal geographical area associated with the order ID;

and

notifying the shipment status of order to the customer.

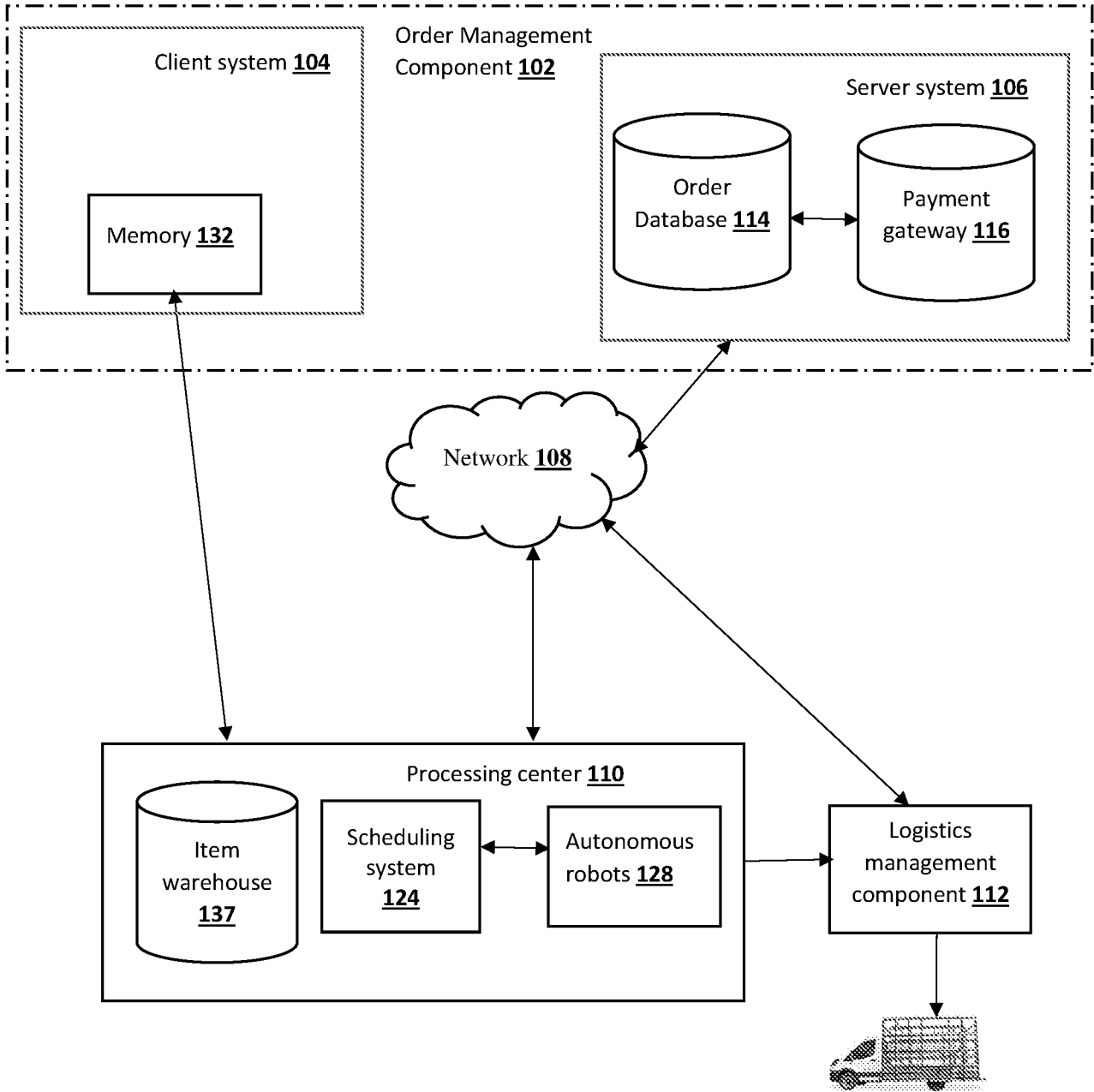


FIG. 1

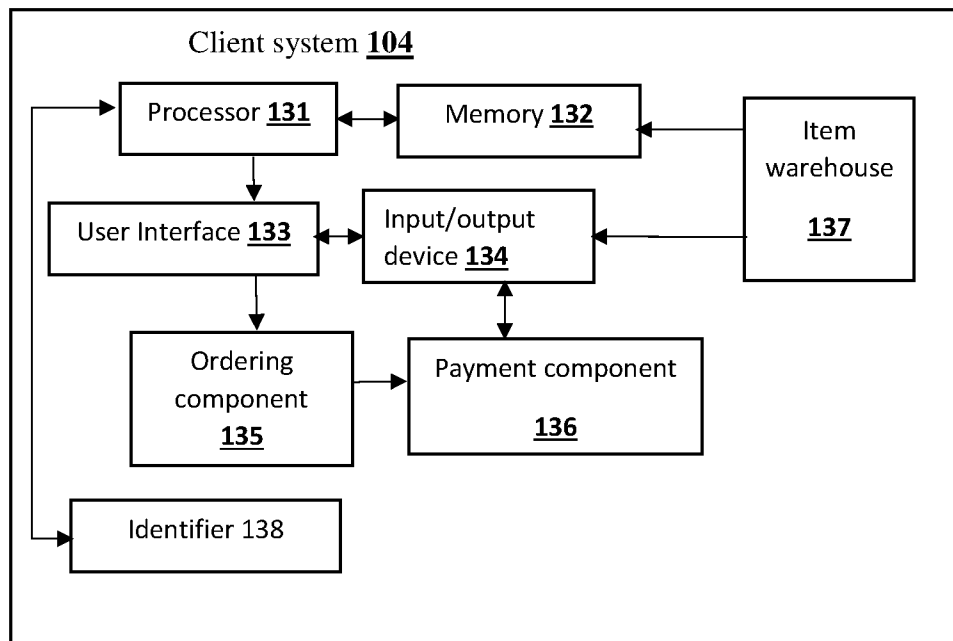


FIG. 2A

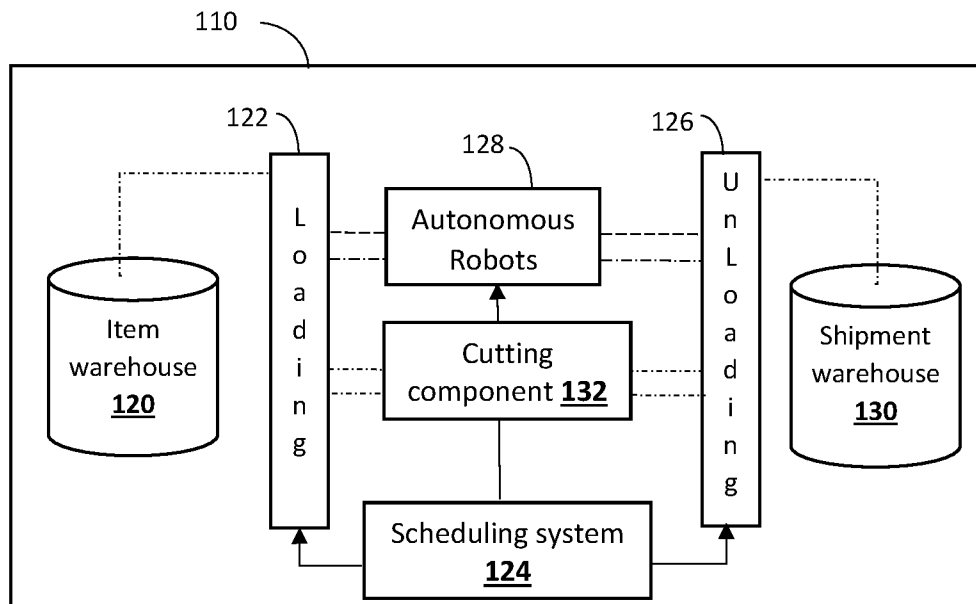


FIG. 2B

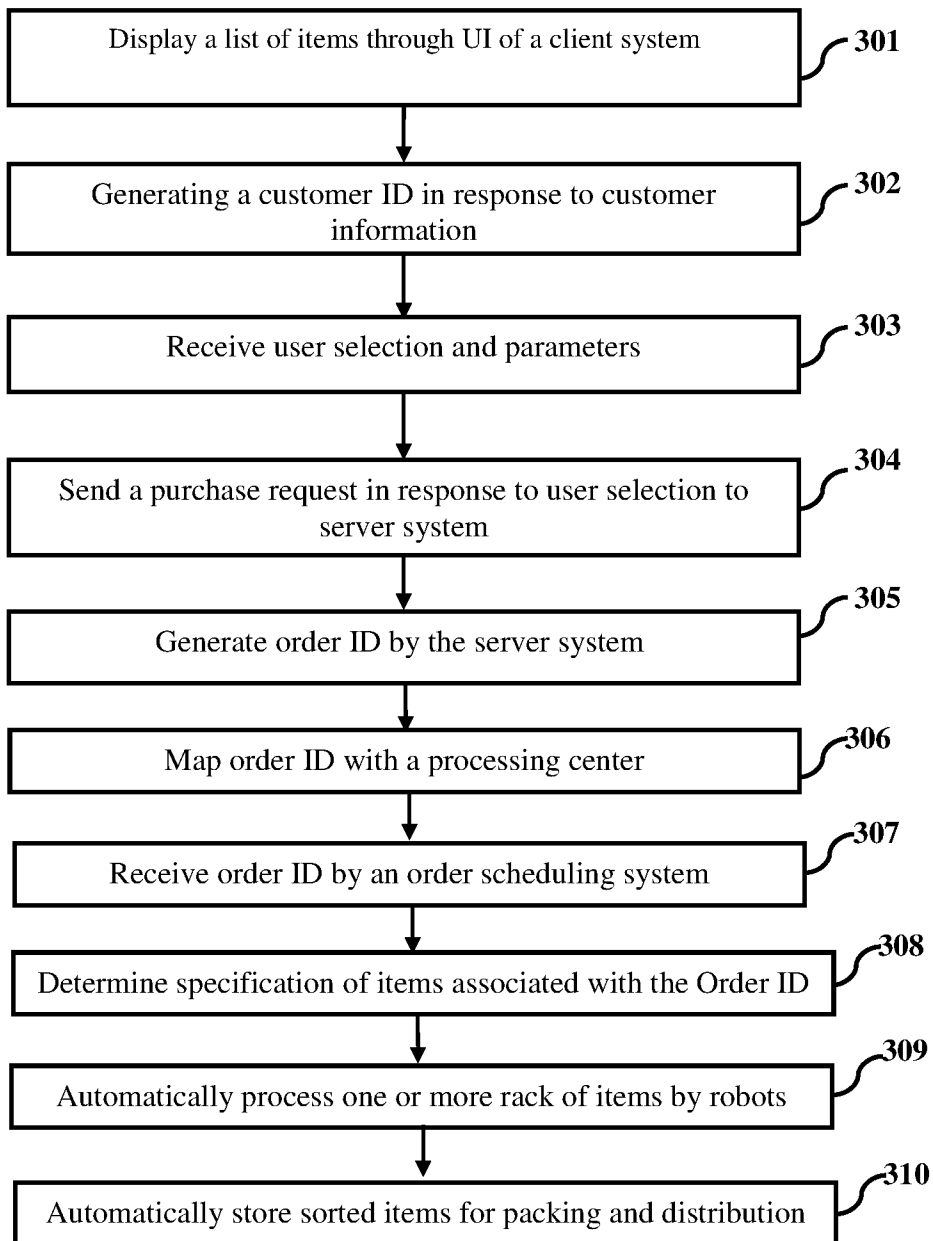


FIG. 3

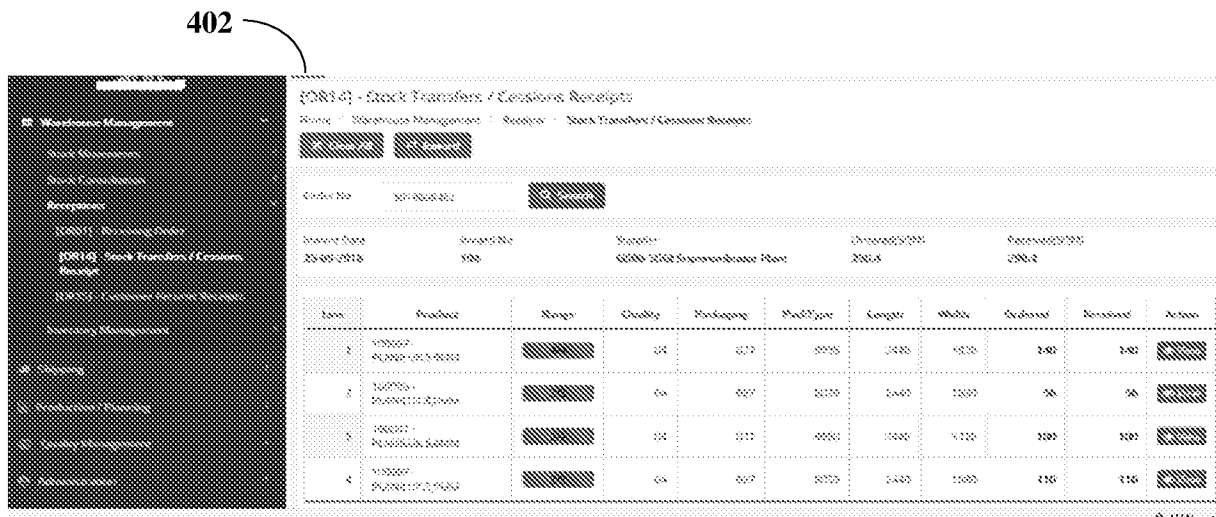


FIG. 4

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IN2019/050913

A. CLASSIFICATION OF SUBJECT MATTER  
G06Q50/28,G06Q10/08 Version=2020.01

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases: TotalPatent One, IPO Internal Database

Keywords: glass, panel, warehouse, robot, automatic, processing

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CA2142484C (ANDERSEN CORP) 22 February 2005 (22-02-2005) Abstract, Claims 1, 2, 4, 5	1-17
Y	EP1122194B1 (Johnson and Johnson Vision Care Inc) 10 November 2004 (10-11-2004) Claims 19, 21, 25, Paragraphs [0025], [0027]	1-17

Further documents are listed in the continuation of Box C.  See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/IN2019/050913

Citation	Pub.Date	Family	Pub.Date
CA 2142484 C	22-02-2005	US 5570292 A	29-10-1996
EP 1122194 B1	10-11-2004	AU 1678301 A	02-08-2001
		CA 2333334 A1	01-08-2001