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(54) Title: ROBOTIC MEAL-ASSEMBLY SYSTEMS AND ROBOTIC METHODS FOR REAL-TIME OBJECT POSE ESTIMATION OF HIGH-RESEMBLANCE RANDOM FOOD ITEMS

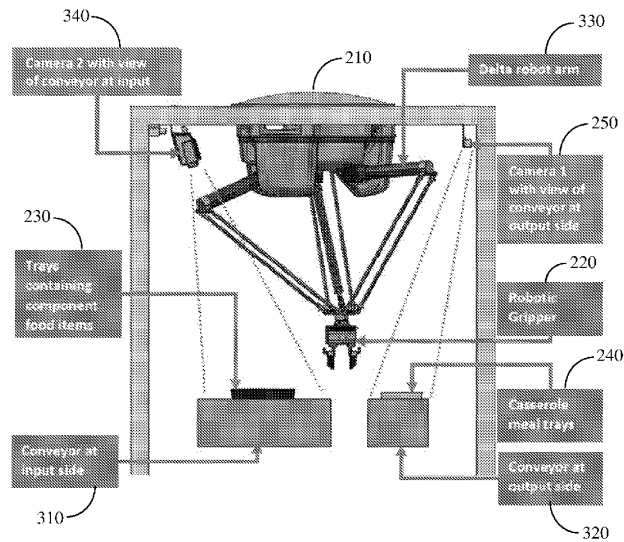


FIG. 3

(57) **Abstract:** Methods, systems and computer readable media are provided for automatic kitting of items. The system for automatic kitting of items includes a robotic device, a first imaging device, a computing device and a controller. The robotic device includes an arm with a robotic gripper at one end. The first imaging device is focused on a device conveying kitted items. The computing device is coupled to the first imaging device and is configured to process image data from the first imaging device. The computing device includes item arrangement verification software configured to determine whether each item desired to be in the kitted items is present or absent in the kitted items in response to the processed image data from the first imaging device and generates data based on whether an item desired to be in the kitted items is absent from the kitted items. The controller is coupled to the computing device to receive

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the data from the computer representing whether an item desired to be in the kitted items is absent from the kitted items. The controller is also coupled to the robotic device for providing instructions to the robotic device to control movement of the arm and the robotic gripper, wherein at least some of the instructions provided to the robotic device are generated in response to the item desired to be in the kitted items being absent from the kitted items.