Customized Solutions

This twin-axis handling system from AMI features a combination of motorized swivel and lifting axes for transferring workpieces. The mechanical interface of this solution is a moving table onto which individually adapted gripper units can be mounted. This handling unit is delivered ready-to-connect together with the sensors required for control and the energy supplies and end position buffers.

The highly dynamic axis combination of the AMI shuttle traverses workpiece carriers under a welding robot. In this particular application, each split second is important for the change of the workpiece carrier. The 11-kW horizontal axis moves a mass of more than 1,000 kg within a second over a distance of 1 m. This is done by a servo motor at a repetitive accuracy of less than +/- 0.3 mm. The lifting axis still achieves a distance of 80 mm in 0.5 seconds. Given the geometrical situation, four eccentric drives have been synchronized by means of shafts and connecting rods. The drive consists of a converter-operated braking motor.
Wherever containers, boxes, pans, workpiece carriers or trays have to be stored temporarily and made quickly available again when required, the stackers and destackers from AMI are being used.

For the stacking functions, two procedures are available. In the 1st procedure, the container stack is moved up and down in each cycle. The containers, boxes, etc. that are fed individually are stacked by placing them inside one another. This is how it works: The empty container is fed to the automatic stacker by a belt conveyor, picked up by the gripper unit and lifted. The subsequent second container is positioned below the lifted one, which is lowered and placed in the second one. The container stack is then lifted again, and the next container positioned below it. This process is repeated until a complete container stack has been formed.

In the 2nd method, the stack is formed as follows: Here, too, the first container enters the stacker unit, is lifted and transferred to a second fixed gripper system. The subsequent second container is positioned below the lifted one, lifted by the moving gripper system and then slid from below into the first container. The fixed gripper system briefly opens and then grips the second container. This process, too, is continued until stack formation is complete. Finally, the container stack is gripped by the moving gripper system and deposited on the belt conveyor. During destacking, the procedures take place in reverse order.

Many versions
The most important difference between the stacking/destacking procedures is that in the second one the entire container stack does continually move up and down. This makes this procedure less noisy and less stressful for the material, which, however, cannot be used for all container geometries. This geometry also decides whether the containers are gripped at the top or laterally.

The automatic stacker and destackers from AMI can be fitted with different drives, depending on the requirements. Pneumatically-operated automatic machines achieve hourly capacities ranging from 1,000 to 1,500 cycles. Automatic machines equipped with lifting axes powered by servo motors and belt conveyors operated by frequency converters achieve capacities of up to 2,400 cycles.

Efficiently closed
The automatic covering machines from AMI allow containers containing mostly consigned goods to be quickly closed. The cover stacks led to the automatic machine are brought to level using a lifting axis. To do so, a light barrier interrogates the edge of the upper cover. On a second indexed conveyor section, the containers that have been placed next to the introduced cover stack, in order to be closed, travel through the machine. A handling system consisting of a swivel axis, a horizontal axis and twin suction crossbars grips the top cover and places it on the container. At the same time, the other side of the crossbar already picks up the next cover. A special feature of the automatic machine shown is that it can process two containers of different heights.

The drives of the toothed belt conveyor and of the lifting axis for feeding the cover are motorized and operated by frequency converters. In contrast, the suction crossbar is operated pneumatically. Such automatic machines achieve up to 1,800 covering cycles per hour.
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