

CARRIER BOARD FOR MULTI-WORKPIECE COLLECTIVELY SCANNING FOR AUTOMATIC PROCESSING LINES

Technical field

The invention relates to the field of machining operation, and in particular to a carrier board for multi-workpiece collectively scanning for automatic processing lines.

Prior Art

In automatic processing lines of machining industry, each workpiece needs to be registered (which is called “workpiece on-line”) with its relevant information before the workpiece is processed on line, in order to control and trace the processing status, measurement results, batch numbers and other information of the workpieces during the production process. In the current operation, each workpiece to be processed (or raw material) is installed on a pallet for positioning the workpiece. The pallet is provided with a scannable RFID chip. When the workpieces to be processed are installed on the pallet, they are scanned manually with an RFID reader for the workpiece. After reading an RFID number, an operator select the product information and scheduling batch for the workpiece to be processed in a production execution system software. When all workpieces on the pallet are scanned and registered one by one, the workpieces of the pallet are moved into a designated position of carrier board by an automatic transporting cart according to the scheduling of the production execution system software to start subsequent processes. After the workpieces are processed and inspected, the automatic transporting cart will move the carrier board back to a production preparation station and scan the chip again to cancel the workpiece information (which is called “workpiece off-line”).

The problems encountered with this approach are as follows.

(1) Low efficiency. Each workpiece is scanned individually, and then the corresponding product batch and process information of the workpiece is selected. It

takes 15-20 minutes to complete the registration of a carrier board with 20 workpieces. If there is a large amount of workpieces to be processed daily, it will require 2-3 production preparation stations and labor. It will take 8-12 minutes to complete workpiece off-line.

(2) Easy to miss scanning. The staff at the preparation station has to register hundreds of workpieces every day, and sometimes they are interrupted accidentally, so it is easy to miss scanning workpieces. Only when the workpiece flow is completed and the workpiece is returned to the preparation station, the missed workpiece is found to be unprocessed because there is no registration information.

(3) Easy to occur errors during manual intervention. At present, in the machine shop, many machine tools, such as EDM, grinding machine, small hole machine, etc., can not yet be connected to the automated production line, so that manual operation is required to cause possible changes of the placement of workpieces. If these workpieces flow back to the automated line but the workpiece information are not re-read, mixed production of workpieces will occur errors. If repeating the operation of workpiece online, it will take a lot of time labor.

The skilled person in the art is committed to solve the above technical defects.

Summary

In view of the above-mentioned defects of the prior art, the object of the present invention is to solve the above-mentioned problems.

In order to achieve the above technical purpose, the invention provides a carrier board for multi-workpiece collectively scanning for automatic processing lines comprising a carrier board body, and a central processor and battery pack provided in the carrier board body, wherein the carrier body is provided with several workpiece stations; wherein the workpiece stations each have positioning pins, and a node unit next thereto, wherein the node unit is connected to the central processor and the battery pack respectively by data wires, and has an RFID chip reader, wherein the central processor is in a signal communication with a server of the processing line via

a wireless signal transmitter, and light strips are embedded around each workpiece station.

Preferably, the carrier board body comprises 12-32 workpiece stations.

Preferably, the positioning pins on each of the workpiece stations are arranged in a cross shape.

Preferably, the carrier board body comprises wire channels defined therein for receiving the data wires.

The invention has the following beneficial effects.

According to the above structural design in which dozens of node units and central processor are introduced, the invention can collectively read workpiece information and realize collective on-line and off-line for workpieces. The efficiency of the production preparation station is greatly improved.

By adding a wireless signal transmitter and a battery pack, the workpiece information that was only read at the production preparation station in the prior art, now can be read at any position and at any time.

By adding light strips, visual management is realized and the status of the workpieces is more intuitive. An operator can intuitively know the state of the workpieces to find unqualified products easier. For example, workpieces that fail to on-line or are missed can be found immediately.

Description of Drawings

FIG 1 is a front schematic view of the present invention;

FIG 2 is a rear schematic view of the present invention;

FIG. 3 is a flow chart showing the principle of the present invention.

In the figure: 1 carrier board body; 2 workpiece station; 3 positioning pin; 4 node unit, 5 wiring channel, 6 light strip.

Embodiments

The conception, specific structure and technical effects of the invention will be

explained as following, with the accompanying drawings, in order to fully understand the purpose, features and effects of the invention.

Embodiment:

As shown in FIGS. 1-3, a carrier board for multi-workpiece collectively scanning for automatic processing lines includes a carrier board body 1. The carrier board body 1 has a 4×5 array of 20 workpiece stations 2. The workpiece stations 2 each have positioning pins 3 in a cross-shaped arrangement, which can be used to position pallets and workpieces on the workpiece stations 2. A node unit 4 with an RFID chip reader for reading and identifying RFID, is fixed in a position next to each workpiece station 2. Wire channels 5 are defined in the carrier board body 1 for receiving data wires. Twenty (in other embodiments, it can also be 12, 16, 24, 28, 32, etc.) node units 4 are connected to a central processor and battery pack respectively by the data wires.

Specifically, the central processor can simultaneously read the RFID information of the twenty workpiece stations 2 and transmit it to a server of the processing line via a wireless signal transmitter. The server can perform on-line and/or off-line operations of the workpieces in bulk.

Specifically, since the carrier board body 1 is self-powered and can wirelessly communicate, the workpiece information on the carrier board body 1 can be read anytime and anywhere. There is no need to move carrier board body 1 back to a production preparation station.

At the same time, in order to enhance visual management and to prevent workpieces from missing or failure of on-line, which can visually display the status of workpieces by color. For example, cyan: on-line success, to be processed; green: processing completed, to be off-line; orange: on-line failure; red: non-conforming products to be processed.

Specifically, in order to prevent the workpiece cutting fluid from dripping in and corroding lines, all the lines after installation, are filled with sealant to seal. Moreover, an acrylic plates is covered on a surface of the carrier board body 1. The

acrylic plate has an attractive appearance and low cost, and is easy to be changed when being damaged or scratched. Compared with conventional aluminum surface, the acrylic plate is easy to be maintained than the.

The above describes in detail a preferred embodiment of the invention. It should be understood that a person skilled in the art can make many modifications and changes according to the concept of the invention without creative labor. Therefore, any technical solution that can be obtained by logical analysis, reasoning or limited experiments on the basis of the prior art by a person skilled in the art according to the concept of the invention shall be within the scope of protection determined by the claims.

Claims

1. A carrier board for multi-workpiece collectively scanning for automatic processing lines comprising a carrier board body (1), and a central processor and battery pack provided in the carrier board body (1), characterized in that: the carrier body (1) is provided with several workpiece stations (2);

wherein the workpiece stations (2) each have positioning pins (3), and a node unit (4) next thereto, wherein the node unit (4) is connected to the central processor and the battery pack respectively by data wires, and has an RFID chip reader, wherein the central processor is in a signal communication with a server of the processing line via a wireless signal transmitter, and light strips (6) are embedded around each workpiece station (2).

2. The carrier board for multi-workpiece collectively scanning for automatic processing lines as claimed in claim 1, characterized in that: the carrier board body (1) comprises 12-32 workpiece stations (2).

3. The carrier board for multi-workpiece collectively scanning for automatic processing lines as claimed in claim 1, characterized in that: the positioning pins (3) on each of the workpiece stations (2) are arranged in a cross shape.

4. The carrier board for multi-workpiece collectively scanning for automatic processing lines as claimed in claim 1, characterized in that: the carrier board body (1) comprises wire channels (5) defined therein for receiving the data wires.