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**DEVELOPMENT OF AUTOMATIC
LABELING SYSTEM
РАЗРАБОТКА АВТОМАТИЗИРОВАННОЙ
СИСТЕМЫ МАРКИРОВКИ**

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Abstract. The automated labeling line consists of the camera reader, the label applicator, the frequency converter, and the operator touch panel. A system management program has been developed using the operator panel. The area of possible practical application of the system is shoe manufacturing.

Аннотация. Автоматизированная линия маркировки продукции состоит из камеры-считывателя, принтера – аппликатора этикеток, преобразователя частоты, сенсорной панели оператора. Разработана программа управления системой с помощью панели оператора. Областью возможного практического применения системы является обувное производство.

The labeling of goods in the Republic of Belarus is designed to protect products that are included in the legislative list from forgery and counterfeit. This will reduce the number of illegal and non-certified goods that citizens of the country purchase under the guise of originals. Product labeling in the Republic of Belarus transfers control over this area into the hands of the state, which guarantees the quality of each product or product on the market, provided that it has a code [1].

The development and improvement of product labeling systems makes it possible to increase the level of information support, the quality of products and reduce the volume of sales of non-certified goods.

There are several types of marking suitable for different tasks.

Drip-jet marking is a non-contact method of applying an image to any surface, in which all elements of this image are formed by drops of liquid paint or ink [2].

Laser marking uses a laser beam to create permanent markings on various surfaces. This process is very precise and can be used to create a wide range of markings, including logos, serial numbers, barcodes and other forms of text or images [3].

Impact-point marking is used for mechanical marking of materials with hardness up to 63 HRC [4].

Electrochemical (electrolytic) marking is a way of applying information to metal surfaces without damaging them [5].

Labeling is the gluing of labels on the surface of consumer packaging or group packaging, pallets-pallets with finished products [6].

The marking line is designed to automate the labeling process. Thanks to the sensors, labeling is fast and accurate. If a damaged label is applied, the product is automatically removed from the conveyor line.

DataMan 260 readers are selected for video surveillance and fixing images of units of goods. For printing and applying self-adhesive labels on the side and top of flat products, an automatic label applicator printer H-IIP-02 has been selected. To monitor the presence and detection of various objects without direct contact with the objects themselves, the KIPPRIBOR OK50 series optical contactless sensor is selected. A three-phase asynchronous general purpose electric motor АИР90LB8 was selected as the conveyor drive. To control the speed of the conveyor, a vector frequency converter ПЧВ3-1.5К-В is selected. A monoblock controller with discrete inputs/outputs of the OBEH ПЛК110 series was selected as the control device. For a visual display of parameter values and operational management, maintaining an archive of events or values, select the OBEH СП307-Б operator touch panel. To move the goods from the conveyor belt, we will choose a pneumatic cylinder of the Pneumax series 1303, a pneumatic distributor with electropneumatic control of the Pneumax series 488.

An assembly drawing of the system has been developed, shown in Figure 1.

After selecting the type of marking by the operator on screen 5, the goods will begin to move along the conveyor belt 1, which is driven by a three-phase asynchronous electric motor 2 using a belt drive. After the optical contactless sensor notices the goods moving along the conveyor belt 1, it will give a signal to the label applicator printer 3, which will apply the marking. Next, the product passes under the infrared camera with a reader 4, which checks the label for damage, and if there is any damage, the pneumatic cylinder 6, located further on

the conveyor line, will push the defective product. The product that has passed the inspection will go to the next stage of processing.

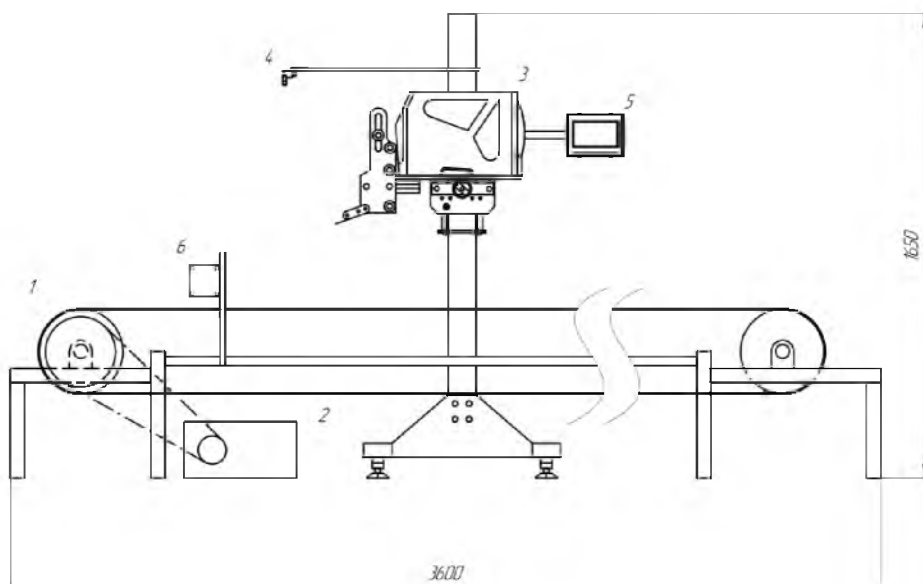


Figure 1 – System assembly drawing

The CODESYS software package was selected for the development of the control program. The main purpose of the CODESYS complex is an application development environment for programmable logic controllers.

The developed software allows you to start/stop the marking process, set batch parameters, control the quality of the application of codes and the current state of the system. The information about the numbers of the current unsaved codes, the number of applied, checked, rejected markings is displayed on the screen.

The system start is implemented using the input variables `pack` and `all_z`, trigger `rs1`. The system stop is performed using the input variable `close`, trigger `rs2`. The input variable `pause` is used to stop the system. When the system starts, the `pusk` variable takes the value “true” and the `rs1` trigger goes into the active state. When the system is stopped, the `close` variable takes the value true, the `rs2` trigger goes into the active state, the `rs1` trigger is reset. When paused, the `close` variable takes the value “true”, the `rs1` trigger is reset, the `rs2` trigger is inactive.

Visualization of the applied codes is implemented using the variables `all_tek`, `show_text`. When checking codes with a technical vision camera, the number of unread codes is recorded in the variable `fales_scanning`, the number of repetitions in repeaters that do not correspond to the codes `d no_repeat`.

Thus, all the components necessary for the implementation of the labeling line have been designed. The area of possible practical application of the system is shoe manufacturing.

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**PSYCHOLOGY OF PERCEPTION OF LOOKBOOK
DESIGN AS ADVERTISING PRODUCTS FOR
LIGHT INDUSTRY**

**ПСИХОЛОГИЯ ВОСПРИЯТИЯ ДИЗАЙНА
ЛУКБУКА КАК РЕКЛАМНОЙ ПРОДУКЦИИ
ДЛЯ ЛЁГКОЙ ПРОМЫШЛЕННОСТИ**

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