A graphical code (2) scanner (4) is placed above the handling workbench in front of the press machine or above every workbench (3). The scanner is controlled by computer (5) software. The tools (1) are put on the surface of the entire hide or fabric, a mechanical press is applied and several different pieces are stamped out simultaneously. Having placed all the tools (1), the operator activates the software controlling the scanner (4) at the moment when the workbench with the hide and tools (1) is located just under the scanner (4). The scanner (4) reads the graphical codes (2) and the cutting process continues as the press exerts pressure upon the tools (1), cutting out pieces of leather or fabric depending on the shape of the tools (1). In parallel with the process of stamping, the software identifies the graphical codes (2) on the tools (1) and processes them. The tool (1) - a die-features a blade (10) with a cutting edge at the bottom. The blade (10) has the desired shape and is reinforced with reinforcements (11). The tool comprises also a graphical code (2). This graphical code (2) can be located either on the reinforcement (11) or on the blade (10).
Method of Automatic Tool Identification and Tool Identified

Technical Field

The invention concerns a method of automatic identification of tools and the identified tool used primarily in the leather and textile industries. Manufactured parts are subsequently processed in the automotive and furniture industries as upholstery covers.

Prior Art

The leather and textile industry currently uses a number of different technologies for cutting leather or fabric to desired shapes. Cutting by carving plotters is one of them. In this case, pre-defined pieces are cut using software. The program needs to be adjusted for hides with non-homogenous dimensions to avoid unnecessarily high waste. Another method is stamping the pieces out by iron tools - stampers which have blades in the shape that needs to be cut. In large-scale production, required in the furniture or automotive industries, such tools are put on the surface of the entire hide or fabric, a mechanical press is applied and several different pieces are stamped out simultaneously. There may be about 8 workbenches around one press machine and entire hides or large pieces of fabric are handled on each of these workbenches. The most important criterion for placing the cutting dies on the hide is the use of material. Thus, it is not so important to cut out parts exactly as requested. What is important is to ensure that the waste is as minimal as possible. The operator therefore aims to fit all the cutting dies on the hide and only then enters the number of cutting dies being used into the computer.
Nature of the Invention

The essence of the invention presented in this technical design is in the proposed method of automatic identification of tools that can automatically identify all the dies that are being used and in the designed tool - a die suitable for use with this method. Every tool (a die) is marked with a label bearing a graphical code containing a graphically encoded identification number of the die type. This code must be small enough to fit even small-sized dies, but the characters of the code should be large enough to be recognised at once from a single snapshot of the entire workbench, i.e. approximately 3200 x 3200 mm. The graphical code should be used to label about 10,000 different tools. The graphical code is a code where the minimum thickness of lines and squares is distinguishable when surface areas of at least 2000 x 2000 mm or more are scanned. Bar codes or QR codes can be used for smaller surface areas.

A code scanner, controlled by software on a computer, is placed above the handling workbench in front of the press or above every workbench. The tools are put on the surface of the entire hide or fabric, a mechanical press is applied and several different pieces are stamped out simultaneously. There may be about 8 workbenches around one press machine and entire hides or large pieces of fabric are handled on each of these workbenches. The most important criterion for placing the cutting dies on the hide is the use of material. Having placed all the dies, the operator activates the software controlling the scanner at the moment when the workbench with the hide and dies is located just under the scanner. The scanner reads the codes and the cutting process continues as the press exerts pressure upon the tools, cutting out pieces of leather or fabric depending on the shape of the tools. In parallel with the process of stamping, the software identifies the codes on the tools and processes them.

A camera can be used as the scanner. Once activated, it will make a snapshot in high-resolution for perfect identification of the graphical codes. In parallel with the stamping process, the software will load the high-resolution snapshot into a computer, where the snapshot is analysed and the graphical codes on the tools are recognised and processed further.
The tool - a die - features a blade with a cutting edge at the bottom. The blade has the desired shape and is reinforced with reinforcements. The tool comprises also a graphical code. This graphical code can be located either on the reinforcement or on the blade.

**Summary of Drawings**

Figure 1 shows an example of a tool with a graphical code. Figure 2 shows a workbench with a graphical code scanner or a camera fitted above the workbench.

**Examples of Carrying out of the Invention**

The proposed method of automatic identification of tools I that can automatically identify all the tools I that are being used, including the designed tool I, which is a die suitable for use with this method. Every tool I (a die) is marked either with a graphical code 2 or a label showing the graphical code 2 containing a graphically encoded identification number of the tool type I. This graphical code 2 must be small enough to fit even small-sized tools I, but the characters of the code should be large enough to be recognised at once from a single snapshot of the entire workbench 3, i.e. approximately 3200 x 3200 mm. The graphical code 2 is used to label about 10,000 different tools I. The graphical code 2 is a code where the minimum thickness of lines and squares is distinguishable when surface areas of at least 2000 x 2000 mm or more are scanned. Bar codes or QR codes can be used for smaller surface areas.

A graphical code 2 scanner 4, controlled by software on a computer 5, is placed above the handling workbench in front of the press or above every workbench 3. The tools I are put on the surface of the entire hide or fabric, a mechanical press is applied and several different pieces are stamped out simultaneously. There may be up to eight workbenches 3 around one press machine and entire hides or large pieces of fabric are handled on each of these workbenches 3. The most important criterion for placing the tools I on the hide is the use of material. Having placed all the tools I, the operator activates the software controlling the scanner at the moment when the workbench with the hide and the tools I is located just under the scanner 4. The scanner 4 reads the graphical codes 2 and the cutting process continues as the press exerts pressure upon the tools.
cutting out pieces of leather or fabric depending on the shape of the tools. In parallel with the process of stamping, the software identifies the graphical codes on the tools and processes them.

A camera can be used as the scanner. Once activated, it will make a snapshot in high-resolution for perfect identification of the graphical codes. In parallel with the stamping process, the software will load the high-resolution snapshot into a computer, where the snapshot is analysed and the graphical codes on the tools are recognised and processed further.

The tool - a die- features a blade with a cutting edge at the bottom. The blade has the desired shape and is reinforced with reinforcements. The tool comprises also a graphical code. This graphical code can be located either on the reinforcement or on the blade.
PATENT CLAIMS

1. This method of automatic identification of tools is characterised by the graphical code (2) scanner (4) placed above the handling workbench in front of the press machine or above every workbench (3). The scanner is controlled by computer (5) software. The tools (1) are put on the surface of the entire hide or fabric, a mechanical press is applied and several different pieces are stamped out simultaneously. Having placed all the tools (1), the operator activates the software controlling the scanner (4) at the moment when the workbench with the hide and tools (1) is located just under the scanner (4). The scanner (4) reads the graphical codes (2) and the cutting process continues as the press exerts pressure upon the tools (1), cutting out pieces of leather or fabric depending on the shape of the tools (1). In parallel with the process of stamping, the software identifies the graphical codes (2) on the tools (1) and processes them.

2. The method of automatic tool identification under claim 1 is characterised by the scanner (4) in the form of a camera. Once activated, the camera will make a high-resolution snapshot for perfect identification of the graphical codes (2). In parallel with the stamping process, the software will load the high-resolution snapshot into a computer (5), where the snapshot is analysed and the graphical codes (2) on the tools (1) are recognised and processed further.

3. The method of automatic tool identification under claim 1 and 2 is characterised by the graphical code (2) where the minimum thickness of lines and squares is distinguishable when surface areas of at least 2000 x 2000 mm or more are scanned. Bar codes or QR codes can be used for smaller surface areas.

4. The tool used in the method under claims 1 to 3 features a blade (10) with a cutting edge at the bottom. The blade (10) has the desired shape and is reinforced with reinforcements (11). It is characterised by the graphical code (2) located either on the reinforcement (11) or on the blade (10).
**INTERNATIONAL SEARCH REPORT**

**International application No**

PCT/SK2013/050011

A. CLASSIFICATION OF SUBJECT MATTER

INV. B26D5/00 B26F1/40

ADD.

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)

B26D B26F

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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