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Look - no hands

"We believe that now is the best time to take footwear production back to Europe to get it close to the consumers, making it more efficient and truly sustainable, which is only possible via robotisation and digitalisation of all data and production chain operations. It is one of the reasons why we are developing this business stream and why the international project of the ICOL Group has started with particular attention to the European markets". So says Dmitry Gontsov, founder and CEO of ICOL Group, an organisation that, at present, may not be very familiar to most of the footwear industry but may well become so through its Belwest project in Belarus.

The international group of companies headquartered in Barcelona. It started in 2017, completed its consolidation in 2019 and currently includes six R&D centres in EU and CIS countries. It opened one in Milan in January and Dmitry Gontsov goes on to say that, "Milan is the centre of contemporary

fashion and the attraction point for creative people, the international trendsetter. We are part of the fashion industry so it's crucial for us to be in tune with it. The Italian office is intended as a bridge between designers, engineers and developers of our industry R&D business line, and the clients and partners of our B2B ecosystem platform. We also see it as an information hub for communicating with the Italian, European and global professional circles. This is our first investment in the European R&D roadmap."

At Simac Tanning Tech in February, the group demonstrated its high-tech solutions for the shoe and leather industries: ICOL.Factory (smart robot factories) and ICOL.Digital (B2B ecosystems). These two technologies are something new and are comprehensive, integrated solutions for the robotisation of production processes and entire industries, powered entirely by AI and, according to the company, with no competitor able match their capabilities.

ICOL.Factory offers comprehensive robotic solutions for production

processes, robots using artificial intelligence and involving no human action to perform operations and reconfiguration of equipment for each new processing cycle, again without any human involvement.

ICOL.Digital provides native interface and the ability to use it without additional installation of services, connects all industry participants from designers and shoe materials and components suppliers to the shoe manufacturers and enables operational tasks in the search, planning and organisation of production and sales to be performed.

The Group believes the footwear industry is facing revolutionary changes. Personalised and digital production, operating according to the concept of Industry 4.0, will bring about a major change in companies with the possibility to manage huge amounts of data that will significantly shorten the time needed for information processing and make it possible to eliminate human labour from both routine and most critical operations. Most importantly, it

will enable the customer to source a unique order that is competitive as regards performance, quality and price. The Belwest digital footwear factory in Belarus is a first pilot project where these approaches are now being implemented and will soon be tested in real production. The company plans to make it possible to visit the factory starting from the end of May (coronavirus permitting) to view what it says is the next generation of footwear production.

THE CONCEPT IN ACTION

The current installation at the Belwest factory comprises 24 processing units and a total of 50 individual robots all supplied by FANUC, a leading company in the field of industrial robotic equipment, as a single integrated production line. Some cells may have one or two robots or, if needed, three or four depending on the operations involved. These are also programmed to interact directly with each other and with the help of AMRs (autonomous mobile robots) in order to move materials or workpieces on the assembly line. Software from embedded to MES (manufacturing execution system), middleware and essential hardware for the processing units, such as robot manipulating tools etc., is all made by ICOL Group itself. Starting as of now (Spring 2020), the aim with Belwest is to reach a production level of two million pairs per annum by the middle of 2022 and then nearly three million in 2023.

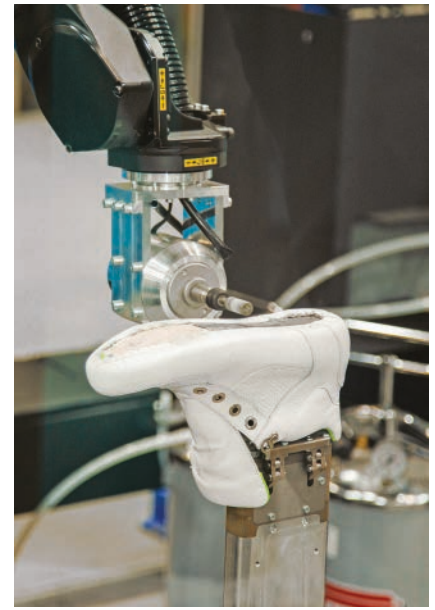
The main operations covered encompass leather digitalisation, automatic defect identification (said to be 98%), preparation for cutting, creation of digital maps for colour zones, sizes and predicting quality zones, nesting, cutting and picking parts in sets. Other operations include preparing and cementing the shoe bottom and sole for final attaching. Initially, quality control and fine-tuning of the production line has been carried out via selective quality control. However, a fully automated VSI (visual quality inspection) system based on digital twins and artificial intelligence is under development and will be ready for initial testing by the end of this year. The expected payback time for the entire project is less than four years, bearing in mind the relatively low salaries in Belarus (two years in higher salaried Western Europe).



Robots are able to interact with other objects as well as the processing cells.

For operations already automated by ICOL.Factory, there is no need to perform any manual setup for operations. The robotic units will run 24/7 without any loss of time for resetting and without any manual program change. All necessary information for each batch of shoes comes automatically together with Digital Twins of the shoes themselves and their twins of materials. The units receive, elaborate and execute these instructions automatically. Some human involvement is nevertheless still required as it can take 185 separate operations to produce one pair of shoes and not all of these can be automated. However, by using innovative technologies, a large number can be performed by robotic and AI systems. The company says that ICOL.Factory can be used with both stuck on and injection moulded constructions and even high heels in the case of the former.

Furthermore, ICOL.Factory processes are said to be compatible with any 2D and 3D design tools currently on the market. Having said that, in the future, the company will doubtless be pushing its own next generation CAD & PDM tools, to allow partner SMEs in particular to design their products in an easier way, without special preparation using complicated tools. It is also able to assist with AI, virtual 3D sampling and photo realistic real time visualisation on design. One thing that sets this digital design and manufacturing system apart from all the others, however, is the



Roughing a lasted margin with the shoe remaining in place on the robot.

manner in which the shoes progress from operation to operation. Instead of being passed from robot to robot or robot to machine to robot, all movements are carried out by mobile robots equipped with a device that grips the last so that one robot carries one shoe from one operation to the next. All that is needed is a flat and smooth factory floor with enough space to allow the robots to move around freely.

ICOL claims that its B2B solutions are uniquely beyond stand-alone machines, intelligent software applications, modern sensors or smart devices. They are comprehensive, integrated solutions for the robotisation of production processes and entire industries powered by AI, something that no global competitor is able to match.

This approach targets superior quality, guaranteed by 100% repeatable operations at a required quality level and at a speed three to five times higher than any other known high performance system currently in existence. While no one knows when the current Covid-19 pandemic will be over and what the long-term economic fallout will be, it will certainly cause shock waves and many brands will probably be taking a closer look at their supply chains. Onshoring and smart automation has been talked about half-heartedly for a number of years; perhaps it will now appear more attractive? If so, ICOL Group thinks it may have a solution. 🌀