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RESEARCH OF DEVICE FOR COATING POLYMER ON THE MATERIALS

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Development of this method and the method of spraying viscous liquids was related to the need to make more economical and cheaper spray systems. In the master's thesis examined the structure and design of the device for dyeing leather upper parts. This device does not require additional and cumbersome systems development and supply of compressed air and for its effective operation requires only electricity. In the device has the ability to change spray nozzles to provide a more economical application of paint in different form and appointment details.

The traditional way of pneumatic spray provides the highest quality appearance, but there are very uneconomic. This happens due to the formation of a large number of paint mists, which entails not only loss of paints, but also the need to use powerful hoods equipped with effective filters. In the proposed device, this problem does not arise because of possible large changes of pressure and volume air and the selection of these parameters to specific conditions and paint technologies.

The developed device for coating leather upper parts consists of cylinder tank to spray liquid, the body and electric. Spray cylinder consists of a pneumatic cylinder, a piston with sealing ring, rod, spray heads, tank lids and Pneumatic.

Pneumatic tank attached to the paint or other substance for the application. Buck combined with spray cylinder via a hose. Buck closed the lid with a hole to equalize pressure. Inside the cylinder is a piston stem. The ring inserted in piston sealing that provides lower chamber Pneumatic tightness.

Movement of the rod provides the motor via crank mechanism. In the lower part of Pneumatic, add variable sprayer through which happens spray paint on the surface of the shoe. Depending on the shape and size of the outlet spray nozzle can be different shapes and sizes of jet spray, allowing more cost-apply liquid to the surface details. The upper part of Pneumatic closing lid with a hole for the rod. The hole made with a certain gap to the free entry of air. It equalizes pressure in the upper chamber of pneumatic cylinders.

Go to the bottom of the Pneumatic suitable channel through which the supply of spray liquid. A stream of air pushes the liquid. Polymer crushed it with the nozzle.

After a patent search and review of existing analytical techniques and methods of coating on the materials have been identified and analyzed their advantages and disadvantages. Based on this analysis was developed to design a device coating on the surface of shoe technology and coating process using this device.

Among the advantages of this device, you can specify the following basic statement:

- A. Lack of bulky compression systems and a supply of air;
2. Most power in terms of 1 liter working volume;
3. Ability to control a wide pressure and quantity of air;
4. Easier and cheaper to manufacture.

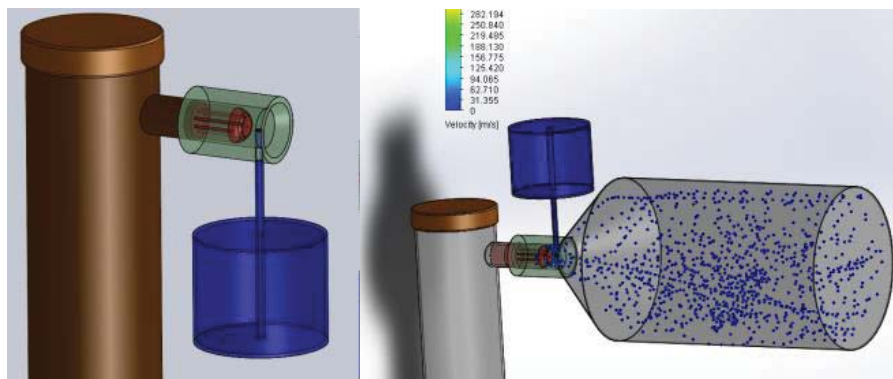


Fig.1 – Modeling of device for coating



Fig.2 - Experimental research of device for coating

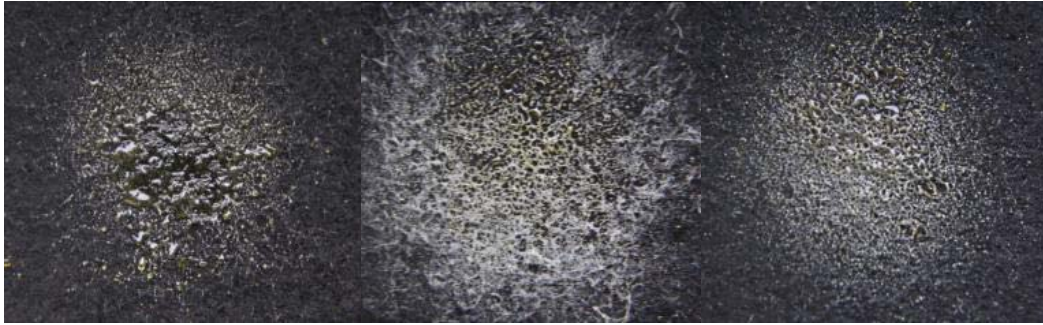


Fig.3 - Result of coating the polymer on the materials

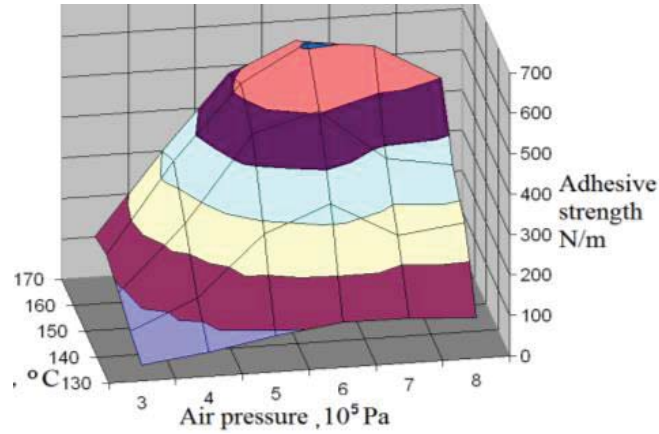


Fig.4 - Dependency of adhesive strength of polymer on temperature (°C) and pressure air spray (10⁵Pa)

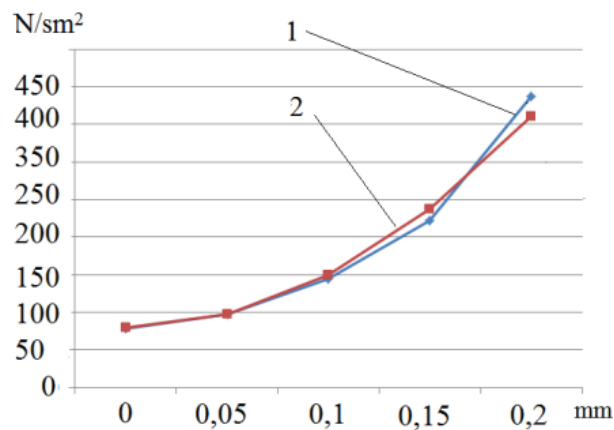


Fig.5 - Effect of thickness of the polymer film of conditional flexural stiffness (1 - experimental data 2 - theoretical data)

We have determined the main physical and chemical attributes of disperse systems that can be put on textile materials on the basis of mathematical modeling of the influence of characteristics of the surface and capillary-porous structure of the materials on the technological processing parameters. Also we have created the program for the choice of the optimal

conditions depending on the characteristics of the coating, mono- or multilayers, their durability, elasticity, adhesion strength.

The technology and equipment for the coating polymer can easily adapt to customer requirements and characteristics of the material. The equipment can be upgraded by additional modules for the production of smaller granules of polymers, transfer of the polymer in liquid state and for pre-inclusions of nanoparticles in the polymer.

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