SNAKE-LIKE, CRAWLING TECHNOLOGICAL ROBOTS FOR THE OPERATION INSIDE PIPELINES

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Robots for automatic motion inside pipelines of various diameters from 100 up to 1000 mm, having essentially different geometrical parameters (radiuses and a configuration of bending, length, etc.) and transporting the various environment (gas, oil, water, etc.) is the modern direction of an application robotics, very demanded by the industry. This paper presents some examples of such robots intended for execution of various technological operations: diagnostics, repairing, clearing, welding, etc. One of the most complex operations is the painting demanding heightened smoothness of the robot motion. Paper introduces new approaches in design and calculations of this robotic system.

Key words: *technological robot for pipelines, snake-like, autonomous robot, designing calculation*

1. Introduction

There is a set of pipelines of various assignments. These are oil pipelines, gas conduits, pipelines of water supply, sewer pipelines, ventilating pipelines.

All these pipelines have the complex ramified configuration. Many of them are difficult to access or are under the ground. Thus there is a necessity to execute inside of pipelines various operations, namely: diagnostics of a condition of an internal surface, repairing, cleaning, painting, welding, etc.

The devices (robots) capable automatically to displace inside of pipelines are necessary for realization of these operations and to carry on themselves the different technological equipment.

In connection with that pipelines have essentially differing geometrical parameters (diameters, radiuses and angles of bending, lengths) and are intended for transportation of various environments (gas, oil, water, etc.) robots also should have various engineering parameters and performances.

Thus, there is a task of creation modeling line of some robots for operations in pipelines.

The robots, capable to displace on horizontal, rectilinear sections of pipelines are most wide-spread. This is so, because these robots have the simplest construction.

Such robots cannot displace on curved sections of pipelines and on the sections making an essential angle with horizon, especially on vertical direction.

The works on creation of the robots, capable to displace on pipelines of any spatial configuration, are carried on in a number of universities of the USA, Germany and other

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