In the present work we deal with the model of elastic lithosphere thickness on Mars. We assume that the surface load of the planet is compensated only by elastic lithosphere deflection and formulate the spatial inversion based on the comparison between predicted and observed geoid. Performing very extensive tests on this inversion in the two dimensional axisymmetric geometry we gain its best parameters. Then we invert the real data and construct the models of Martian elastic lithosphere thickness for filters of variable width. We focus on some topographically significant areas, establish the elastic lithosphere thickness below them and compare the obtained values with published results. For some areas we get agreement. Assigning the age to particular areas we find the growth of elastic lithosphere thickness during time, which is in agreement with the so-called principle of frozen lithosphere.