

SHORT COMMUNICATIONS

On the Calculation of Flat Tapered Figures on the Basis of Representation of Solid Elastic Bodies by Discrete Bar Structures

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In this work the results of one of the tasks of the grant project (SRNSF # 30/24) – Modeling and calculation of tapered (cusped) flat bodies (for cusped bodies see [1]) on the basis of representation of solid deformable bodies by means of combinations of discrete bar structures (about this method see [2-4]) - are presented. In particular, an arbitrarily loaded flat figure of a “beak” shape (see Fig.1), which consists of bar’s discret elements, is considered (see Fig.2). Here the elastic properties are modeled by means of longitudinal and cross-sectional (spiral) springs, while the inert properties are modeled by means of masses concentrated at the knots and the dissipative properties are modeled by dampers (the last ones are not shown in the figure). The parameters of these elements, for example, rigidities of springs are chosen so that the physical and mechanical indices of the body under consideration could be adequately modeled. The reaction of the figure on the load (this can be, for example, a concentrated force F applied at the top of the “beak”) is calculated by means of realization of a specially developed algorithm that enables to carry out simply and effectively an iteration procedure between in a parallel way working computers in the local network and in the internet. The basic difference of the developed approach from classical one consists in representation of the object under consideration by the discrete bar structures instead of investigation of the corresponding governing systems of equations and in determination of an equilibrium state of the object

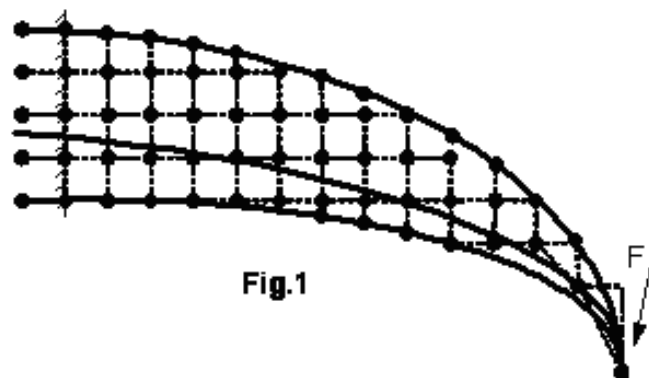




Fig.2

by means of the special algorithm which is equal to the solution of the governing systems of equations. The result of the carried out work enables to make a conclusion about the effectiveness and competitiveness of the described approach by investigating arbitrarily loaded flat figures of a complex configuration (for more information see <http://www.mining.org.ge/develop/pataraia-dmr/index.html>).

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References

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