I. INTRODUCTION

The papers [1], [2] by Dirac, in which the existence of magnetic charges was related to quantization of electrical charges, were followed by intensively searching for magnetic monopoles, however, the search has not yet led to success (see, for example, [3]). All the attempts of such search were complicated by the lack of a satisfactory theoretical description of interactions between ordinary electrical and magnetic charges. Moreover, Rohrlich in [4] stated the "falsehood of variational principle for the full theory of ... electrical and magnetic point charges". Later, Zwanziger in [5] proposed the full action, including an arbitrary constant 4-vector n, with the electromagnetic field propagator being dependent of arbitrary vector n; as a result, the cross-section of the interaction of an elementary particle with magnetic charge and an elementary particle with electrical charge proves to be dependent of the arbitrary vector n (terms in the interaction cross-section, containing arbitrary vector n, can vanish only for interactions of particles with same type of charge).

For the description of the electromagnetic field with electrical and magnetic charges below we use *two* four-dimensional vector potentials A_e and B_g. Apparently, for the first time two four-dimensional vector potentials were used for the description of the electromagnetic field with electrical and magnetic charges in the Cabibbo and Ferrari article [6] – see, for example, Singleton review [7]. While there is not enough information, we are inclined to suppose, that quantums of the A_e-field and the B_g-field are the same. Another possibility is discussed in works [8], [9].

In this paper we propose the full action for an electromagnetic field with electrical and magnetic charges. Particles with both electrical and magnetic charges are not considered (compare with the statement by Weinberg in [10], that "a magnetic monopole cannot bear a normal charge"). Offered full action does not contain arbitrary constant 4-vector n. We formulate Feynman laws for the calculation of the interaction cross-sections for electrically and magnetically charged particles on the base of offered action within relativistic quantum field theory. It is shown, that derived with formulated Feynman rules cross-section of the interaction between an elementary particle with magnetic charge and an elementary particle with electrical charge is equal zero. Possibly, this explains the failure of the search of magnetic monopoles with ordinary elementary particle detectors.

The expressions below are written in Gaussian units; used denotations are close to that