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Abstract: We analyze generalized CP symmetries of two-Higgs doublet models, extending them from the scalar to the fermion sector of the theory. We show that, other than the usual CP transformation, there is only one of those symmetries which does not imply massless charged fermions. That single model which accommodates a fermionic mass spectrum compatible with experimental data possesses a remarkable feature. Through a soft breaking of the symmetry it displays a new type of spontaneous CP violation, which does not occur in the scalar sector responsible for the symmetry breaking mechanism but, rather, in the fermion sector.

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