In this paper we deal with the problem of frontal face detection using Support Vector Data Description (SVDD) to characterize textural attributes of faces. The SVDD classifier relies on PCA features of face samples to obtain a decision boundary around the face data without using information of negative examples (outliers). We analyze the performance of the classifier for different dimensionalities of the feature space and for different selections of the SVDD parameters. Experimental results show that the SVDD can be adopted as an effective tool for making a face detector as a combination of multiple simple one-class classifiers.