Abstract: The dispensing device (1) comprises a first releasing device (2) for a detergent, including a receptacle (4) and an associated openable cover (5), and a second releasing device (3) for a rinsing agent. These releasing devices (2, 3) are intended to be activated at successive times in a washing cycle by successive energizations of a single electrically operable actuator (11) which is mechanically coupled thereto in such a way that a first energization of the actuator (11) is able to modify the state of the first releasing device (2) without changing the state of the second releasing device (3), and a successive energization of the actuator (11) is such as to cause the activation of the second releasing device (3). The actuator (11) is coupled to the cover (5) of the first releasing device (3) through a disengageable and re-engageable retaining mechanism (17-20), configured in such a way that a first energization and the successive de-energization of the actuator (11) cause the passage of the cover (5) to a pre-opening condition and an increased opening condition, respectively.