Even in the absence of external sensory cues, foraging rodents maintain an estimate of their position, allowing them to return home in roughly straight lines. This computation is known as dead reckoning or path integration. Recently, a specific region of the neural cortex has been identified as the location in the rat's brain where this computation is performed, and specific mean-field type neural models have been proposed to mimic the activity of the relevant neurons in the brain. On the side of the mathematics, these models consist of systems of SDEs describing the activity level of MN neurons stacked along N columns with M neurons each. To prevent the noise from driving the activity level of some neurons to be negative, which is clearly not desirable from the point of view of the modelling, reflecting boundary conditions are added at the SDE level. When investigating the limiting behavior, these boundary conditions persist in the associated McKean-Vlasov equation and in turn translate into no-flux boundary conditions for the corresponding Fokker-Planck PDE. The combination of the spatial interaction and the interaction along columns further complicates the picture, reducing the usual properties of mutual independence of the limiting particles. We discuss and answer classical questions in the mean-field theory setting: well-posedness of the relevant systems and equations, limiting behavior, sharp estimates for the rate of convergence of empirical measures.