Independence of two events A and B is defined as $\mathbb{P}(A \cap B) = \mathbb{P}(A) \cdot \mathbb{P}(B)$

A and B are disjoint if $\mathbb{P}(A \cap B) = 0$.

Hence, the events A and B can only be independent and disjoint at the same, if either $\mathbb{P}(A)$ or $\mathbb{P}(B)$ or both at the same time is 0.

Later:
Formally, this could be true for a uniformly distributed variable $X \sim U(0, 1)$:
Event $A = \{(x = 0.54345)\}$
Event $B = \{(x = 0.886655444)\}$
Obviously, $A \cap B = \emptyset$ since these are different numbers and we only draw one time. Furthermore, $\mathbb{P}(A) = \mathbb{P}(B) = 0$ since for all continuous distributions, the probability of single numbers equals zero.