WHAT IS CLAIMED IS:

1. A safety syringe comprising;

a needle seat having a first shaft hole at a rear end thereof;

an adapter having a second shaft hole through front and rear ends thereof, the second shaft hole of the adapter being sleeved on the rear end of the needle seat and communicating with the first shaft hole of the needle seat, an outer surface of the adapter having an elastic wing;

an injection barrel having a barrel body and a shaft portion integrally connected with a front end of the barrel body and detachably penetrated into the first shaft hole of the needle seat and the second shaft hole of the adapter; and

an outer sleeve having a front opening and a rear opening, an inner surface of the outer sleeve having a first annular rib adjacent to the front opening and a second annular rib adjacent to the rear opening, the outer sleeve being sleeved on the injection barrel and movable along an axial direction of the injection barrel between a first position where the first annular rib of the outer sleeve is engaged with the elastic wing of the adapter, such that the outer sleeve is sleeved on the barrel body of the injection barrel and the needle seat is allowed to protrude from the front opening of the outer sleeve, and a second position where the outer sleeve accommodates therein the needle seat and the adapter and pushes against the elastic wind of the adapter through the second annular rib, such that the outer sleeve is detachable from the injection barrel together with the needle seat and the adapter;

wherein an outer surface of the needle seat has an outer flange, and an inner surface of the adapter has an inner flange interfered with the outer flange of the needle seat;

wherein the inner surface of the adapter has a baffle protruding in the radial direction of the second shaft hole to prevent the needle seat from being separated from the adapter.

2. The safety syringe as claimed in claim 1, wherein an outer surface of the barrel body of the injection barrel has an elongated rib forced against the second annular rib of the outer sleeve when the outer sleeve is located at the first position.

3. The safety syringe as claimed in claim 1, wherein an inner surface of the outer sleeve has a third annular rib adjacent to the second annular rib and located between the first annular rib and the second annular rib; the elastic wing of the adapter is located between the second annular rib and the third annular rib when the outer sleeve is located at the second position.

4. The safety syringe as claimed in claim 3, wherein an inner diameter of the second annular rib is greater than an inner diameter of the first annular rib and an inner diameter of the third annular rib.