
The Analysis on The Unmanned Turret Technology

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Abstract

The future trend of tanks and armored vehicles is lightweight, but they must not be sacrificed at the cost of firepower. How to ensure the armored combat vehicle's powerful firepower and its own survivability on the basis of lightweight is a problem that must be considered and solved. Active tanks and armored vehicles are basically equipped with human turrets. However, on the battlefield, the turret is the highest probability of being hit, and the crew in the turret is in serious danger. To this end, the world has started the development and development of unmanned turrets since 1960s. With the accumulation and progress of technology, a large number of unmanned turrets mounted on tanks and armored vehicles have emerged in recent years.

Keywords

Unmanned turret; technology.

1. The concept and development of unmanned turret.

1.1 The concept of the unmanned turret

The unmanned turret, also known as top-mounted weapon turret, refers to the tank and armored vehicle weapon parts installed in the top of the car, the crew is located in the low body of the car. Top mounted weapons can be rotated, and some can even lift. The unmanned turret is small, the front projection area is reduced, and the weight of the vehicle is reduced. At the same time, the crew is located in the body of the vehicle, and the survivability of the crew in the battlefield is improved.

1.2 The development of the unmanned turret

After more than 40 years of development, the technology of the unmanned turret has matured, and there have been a variety of unmanned turrets used for tanks and armored vehicles, but the overall performance of the turret has not been obviously beyond the turret. At present, most of the existing armored combat vehicles are equipped with conventional weapons in the turret. Since 1960s, some countries have been trying to develop a new vehicle mounted weapon system to replace the traditional turrets, and to produce an experimental tank with support to install artillery. Among them, the earliest was the COMRES 75 experimental vehicle made in Britain in 1968, which installed a gun on the top support of the flat turret.

Up to now, only some of the medium caliber automatic weapons have adopted the way of bearing installation. One of the earliest examples is the 20mm machine gun turret manufactured by Sweden's Bofors in 1962 for the country's Pbv301 crawler armored personnel carrier. The 1970s products included the "KUKA" 20 millimeter gun turret used by the German "weasel" infantry chariot and the artillery reconnaissance vehicle of Holland, which was used by the "El Ikon" 25 millimeter organ gun turret. Like the "mobile artillery system" of the General Dynamic Corp, the above three kinds of turrets are transported through the artillery support. This process is completed in the turret, and the security is guaranteed.

In 1980s, there were some new changes in the development of tank turrets, and began to develop unmanned remote control turrets. General Dynamics Corporation of the United States first used this kind of turret on the tank test bed (TTB) made of M1 tank chassis in 1984, but the result is not satisfactory.

Later, the unmanned remote control turret began to be used in lighter weight armored combat vehicles. In 1990s, the United Kingdom and the United States developed a remote control turret equipped with CTA 40 millimeter 40 millimeter guns for the joint development of the T R A C E R/F S C S reconnaissance vehicle, but the plan was cancelled in 2002. The manned combat system (MCS) of the "future combat system" developed by the United States and the "cougar" infantry chariot equipped with 30 millimeter guns developed by Germany all use the design idea of the remote control turret. France is also developing the "toddis" turret for its EBM (6 * 6) wheeled chariot (originally EBRC) in accordance with this design idea.

At present, in addition to Russia, in addition to Russia, most other countries have developed vehicle automatic weapons that have stopped using the old-fashioned support structure, instead of using the "skeleton" installation, that is, to remove the armoured protection of weapons, projectiles and (in most vehicles) ammunition cases (in most vehicles), such as the French ground face weapons industry group in 1970s. The "II" turret made by AMX-10P crawler armored vehicle equipped with 20 mm artillery. However, the artillery installation, which used an exposed projectile, did not get more widely used in the next ten years until it began to apply to the vehicle's 12.7 millimeter machine gun in 90s. At present, some 25 mm and 30 mm artillery guns have also adopted this installation method.

2. The Main Advantages of The Unmanned Turret

The unmanned turret structure is very unique, it uses low type unmanned turret, the turret is small, it can reduce the probability of being hit, the crew and ammunition can be arranged in the body with heavy armor protection, which improves the survivability of the crew. At the same time, due to the reduction of the height of the car body and the reduction of the weight of the car body, it is also suitable for the future deployment of weapons and airplanes.

2.1 The unmanned turret system can improve the combat environment of crew and shooter.

The artillery and the battle chamber are basically separated, so the tail gas fired by the artillery is completely isolated from the battle chamber and will not affect the work of the crew. Especially noteworthy is that the unmanned turret tanks and armored vehicles are placed in the vehicle ammunition, and after the compartment placed, basically will not be detonated. The artillery shells in the unmanned turret system are divided into three places: the drum-shaped barrel of the turret hanging basket, the auxiliary barrel in the vehicle and the spare barrel.

In addition, the seats of vehicle drivers and gunmen are basically parallel, and the 2 people can maintain close contact at any time. A control panel is set in front of the 2 people, which can not only effectively control the working conditions of the components in the car, but also facilitate the exchange of operational awareness between the car length and the gunner. When the tank gun is fired, it will produce a strong vibration, which will cause great pressure on the crew in the vehicle and reduce their reaction ability. However, in the unmanned turret system, the expansion wave recoil technique can be used, the recoil force is small, and the impact on the passengers in the vehicle is relatively small.

2.2 The unmanned turret system can improve the survival ability

The unmanned turret combat vehicle, there are only body tubes and gun tail bodies on the car body, and the occupants (including the shooters) are located in the car body and below the turret ring, thus improving the crew's battlefield survival probability. The turret volume is significantly reduced, and the probability of being hit is significantly reduced, thus greatly improving the battlefield survival rate of equipment and the survival rate of crew. From the protection point of view, the low turret is smaller and the corresponding armor plate is smaller, which can reduce the weight of the armored

vehicle and enhance the mobility of the armored vehicle. Although the top artillery armor for low turret turrets is relatively weak, it can reduce the possibility of occupants, weapons, and ammunition exposed outside, thus avoiding casualties and internal damage. At the same time, the unmanned turret combat vehicles can reduce the weight of the chassis without sacrificing the power of the artillery, and increase the mobility of the fighting vehicles, and thus improve the survivability of the fighting vehicles.

2.3 The unmanned turret system has good maintenance performance

The unmanned turret system and its related devices are all outside the car body. There is no package of existing tank turrets, which can be disassembled very easily from the body, without the need for complex artillery movements like the existing tanks. This will greatly improve the maintenance performance of artillery. Artillery system is more often replaced in battlefield emergency repair. The overhead structure of artillery in unmanned turret is conducive to the development of battlefield emergency repair.

3. Conclusion

The idea of unmanned turret technology has long existed and has been developed and tried for many years. So far, however, there are still some technical difficulties that become the obstacle for the top gun to go to the battlefield. The first technical problem is the remote control of the artillery's pitch and horizontal rotation; the second is how to send the projectile from the barn to the tail of the artillery automatically. The third difficulty is to use appropriate auxiliary technology to ensure the combat technical index of combat system.

After years of development and testing, and with the rapid development of electronic technology and ballistic technology, these problems have been partially solved. The weight of main battle tanks is increasing with the day, which seriously affects the development of tanks. The small size and light weight of the top gun can greatly reduce the burden of tanks, and provide an important way for future main tank.

References

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