

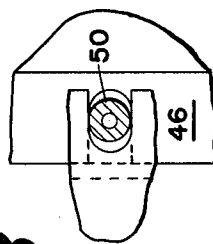
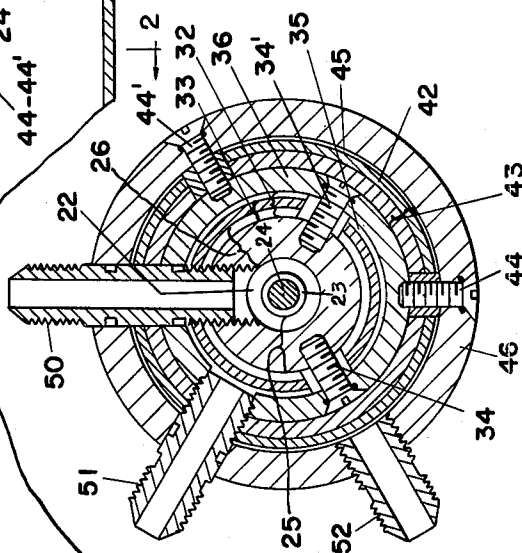
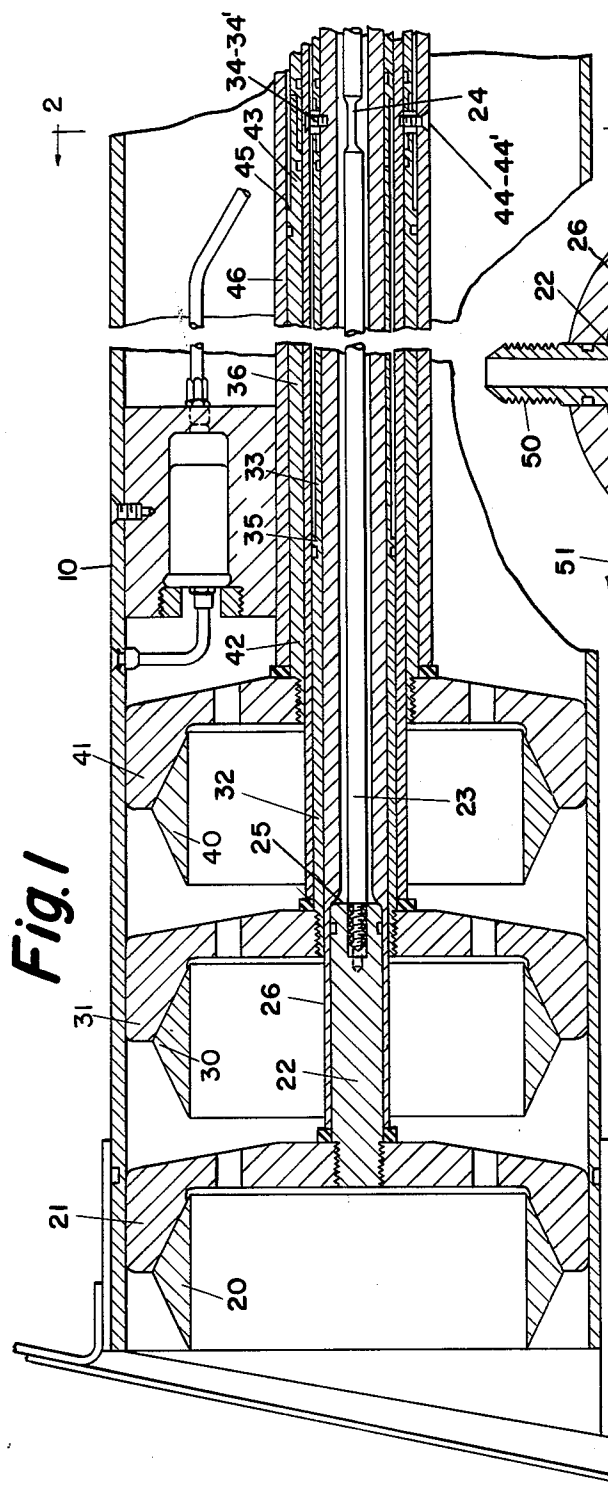
**Dec. 28, 1965**

I. R. BARR

**3,225,654**

## MULTIPACKAGE LAUNCHER

Filed May 28, 1964



INVENTOR.

**IRWIN R. BARR**

BY *Harry M. Saragovitz,*  
*Edward J. Kelly, Herbert Berl,*  
*& S. Dubroff*  
**ATTORNEYS**

1

3,225,654

## MULTIPACKAGE LAUNCHER

Irwin R. Barr, Lutherville, Md., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Army  
Filed May 28, 1964, Ser. No. 371,162  
3 Claims. (Cl. 89—1.5)

This invention relates to an improved launching apparatus and particularly, to a multitube apparatus for launching pairs of decoy packages simultaneously.

In the modern era of nuclear weaponry the role of the missile as our first line of defense is fully conceded. Unquestionably the missile has had a tremendous impact on our military strategy both in the hot war as an offensive and defensive weapon capable of inflicting great destruction on the enemy and in the cold war as a deterrent to acts of aggression. However, recent progress in the direction of neutralizing the fire power of the missile necessitates counter-measures if present missile efficiency is to be maintained. A principal missile counteractant, which presently is acknowledged as operational, is the so-called "anti-missile missile." The employment of this weapon is conjoined with that of the radarscope to effect a cooperative result which poses a serious threat to the value of the missile as a tactical weapon.

Accordingly, a principal object of the present invention is to provide means for neutralizing the fire power of anti-missile missiles.

Another object of the invention is to provide an apparatus for launching packages which act as decoys for anti-missile missiles when viewed on a radarscope.

A further object of the invention is to provide an apparatus for use in combination with a missile whereby decoy packages for anti-missile missiles may be launched in flight.

In accordance with the present invention the foregoing and other objects are achieved by providing means for launching simultaneously pairs of packages which act as decoys when viewed on a radarscope, thereby effecting a disruptive influence on the cooperative relationship between anti-missile missile and radarscope. A better understanding of the invention may be had by recourse to the following description, which description should be considered in conjunction with the accompanying drawings wherein:

FIG. 1 depicts a sectional side view of a specific embodiment of the inventive apparatus;

FIG. 2 depicts a cross-sectional view of a portion of the apparatus of FIG. 1 through section 2—2; and

FIG. 3 depicts an enlarged top view of the construction of the apparatus about one of the gas ports.

In general, the inventive apparatus comprises a propellant actuated device which permits a propellant to burn in a closed volume initially, thereby generating sufficient gas pressure to overcome a restraining force whereupon gas expansion propels a pair of packages. The device may be described as a multitube launcher with each tube located concentrically about a common longitudinal axis. Each tube is employed to launch simultaneously two decoy packages, one package being located at each end of a tube. The energy required to launch each pair of packages is provided in the form of gas pressure and may be supplied to each tube by any suitable means. For example, the latter may comprise propellant cartridges, in which case one such cartridge is employed for each tube, a separate fire signal being delivered for each pair of packages launched. Simultaneous release of packages in each pair is insured by the employment of a novel "shot start" mechanism. By this mechanism propellant gas pressure acts on the outermost pair of packages,

2

which packages are linked by a tie rod. Failure of this rod in tension effects the desired simultaneous release. Subsequent separation of each of the inner pairs of packages is effected by shearing a pair of locking pins. These locking pins serve the same function with respect to the inner pairs of packages as the tie rod serves with respect to the outermost pair of packages. Distinctive advantages of the mechanism, in addition to the production of an essentially recoilless firing condition and the simultaneous release of the packages in each pair, include positive restraint of packages prior to firing and satisfactory propellant burning characteristics during firing.

The launcher, including the barrel wherein the multitube apparatus is inserted, may be factory assembled in its entirety and thus, loaded or removed from a missile as a single unit. This facilitates field handling and obviates the necessity of actual assembly being performed by tactical personnel.

While the invention is not limited to a fixed number of tubes or pairs of decoy packages, for the purpose of simplicity the drawings have been limited to the illustration of a launcher containing three tubes and three pairs of decoy packages.

FIG. 1 depicts a portion of the inventive launcher incorporated within a missile. The remainder of the launcher comprises a mirror image of this portion and extends coaxially to the right from line 2—2. Attached directly to the missile wall is barrel 10 within which sabots 21, 31 and 41 positioning outer decoy package 20, middle decoy package 30 and inner decoy package 40, respectively, are slidably inserted. Outer decoy package 20 is linked to its mirror image counterpart by means of tie rod 22 which is attached, e.g., by screw threads, to the centers of sabot 21 and the counterpart thereof. Tie rod 22 is inserted in inner tube 26 and comprises two large diameter or inner piston sections, which extend inwardly from each sabot and make slidable contact with the inner surface of tube 26, and a small diameter section 23 joining said piston sections. A small necked down portion 24, provided at the middle of tie rod 22, is designed to rupture upon the introduction of a predetermined gas pressure to the annular space between small diameter section 23 and inner tube 26. This gas pressure biases inner piston face 25 and its counterpart.

Middle decoy package 30 is linked to its mirror image counterpart by means of middle connecting sleeve 32 comprising two middle piston sections which extend inwardly from sabot 31 and its counterpart making slidable contact with the outer surface of inner tube 26 and the inner surface of middle tube 36 and a reduced outer diameter section 33 joining said middle piston sections. Middle connecting sleeve 32 is divided into two parts, one being attached to sabot 31 and the other being attached to the counterpart thereof. The two sleeve parts are positively locked together by a pair of locking pins 34 and 34' which join overlapping portions of said parts at the middle of the launcher, designated as line 2—2. Locking pins 34 and 34' are designed to shear upon the introduction of a predetermined gas pressure to the annular space between the reduced outer diameter section 33 of middle connecting sleeve 32 and middle tube 36 which biases middle piston face 35 and its counterpart.

Inner decoy package 40 is linked to its mirror image counterpart by means of outer connecting sleeve 42 comprising two outer piston sections which extend inwardly from sabot 41 and its counterpart making slidable contact with the outer surface of middle tube 36 and the inner surface of outer tube 46 and a reduced outer diameter section 43 joining said outer piston sections. Outer connecting sleeve 42 is divided into two parts, one being attached to sabot 41 and the other being attached to the

counterpart thereof. The two sleeve parts are positively locked together by a pair of locking pins 44 and 44' which join overlapping portions of said parts at the middle of the launcher. Locking pins 44 and 44' are designed to shear upon the introduction of a predetermined gas pressure to the annular space between the reduced outer diameter section 43 of outer connecting sleeve 42 and outer tube 46 which biases outer annular face 45 and its counterpart.

Referring to FIG. 2 it may be seen that gas ports 50, 51 and 52 are provided for the purpose of introducing propellant gas pressure to inner, middle and outer annular spaces, respectively, whereby inner, middle and outer annular faces 25, 35 and 45, respectively, and their respective counterparts are pressure biased. Said gas ports emanate radially from the middle of the launcher, gas port 50 being rigidly affixed to outer tube 46, middle tube 36 and inner tube 26, gas port 51 being rigidly affixed to outer tube 46 and middle tube 36, and gas port 52 being rigidly affixed to outer tube 46. The construction of the sleeves where a gas port passes through is shown in FIG. 3. Each of the gas ports is connected by a suitable coupling to a source of gas pressure, for example, a propellant cartridge. An assembly 60 for such a cartridge is depicted in FIG. 1. In such case, as indicated heretofore, each port is connected to a separate assembly and a separate fire signal is required to launch each pair of packages. Thus, the time interval between firings may be varied, thereby permitting greater latitude in tactical operation.

Having thus described my invention so that others skilled in the art may be able to understand and practice the same and it being expressly understood that the invention is not limited to the aforesaid preferred embodiment but may be otherwise embodied or practiced without departing from its spirit and scope, I state that what I desire to secure by Letters Patent is defined in what I claim.

I claim:

1. A multitube launching apparatus for launching pairs of decoy packages simultaneously, said apparatus comprising

a cylindrical barrel adapted to be incorporated within a missile,

a series of pairs of decoy packages positioned by sabots slidably inserted in said barrel, the packages comprising each pair of said series being positioned on opposite sides of the middle of said barrel and equidistant therefrom and being joined to each other by connecting means,

each of said connecting means being alternately arranged with concentric tubes coaxially aligned with the longitudinal axis of said barrel and comprising piston means slidably inserted in and positioned at opposite ends of said tubes,

said piston means in each tube being joined to provide therebetween an annular space separating the joining means from its immediate circumscribing tube, each such annular space communicating with a separate source of propellant gas pressure, said pressure being sufficient to effect failure of said joining means and to launch the resultant unjoined pair of decoy packages.

2. A multitube launching apparatus according to claim 1 wherein the outermost pair of decoy packages is joined by connecting means comprising a rod, said rod having a necked down portion at about its middle to control failure location.

3. A multitube launching apparatus according to claim 2 wherein each pair of decoy packages other than said outermost pair are joined by connecting means comprising a sleeve having two sections, each of said sections extending inwardly from a decoy package and overlapping at the middle of said barrel, and a pair of locking pins joining said sections at their overlap, said pair of locking pins being designed to fail in shear upon introduction of said gas pressure to the annular space between said sections and their immediate circumscribing tube.

No references cited.

BENJAMIN A. BORCHELT, *Primary Examiner*.  
SAMUEL W. ENGLE, *Examiner*.