July 8, 1969 J. COOPER ET AL 3,454,278

THROWING DART WITH FLY-APART WINGS

Filed Feb. 21, 1967 Sheet 1 of 2

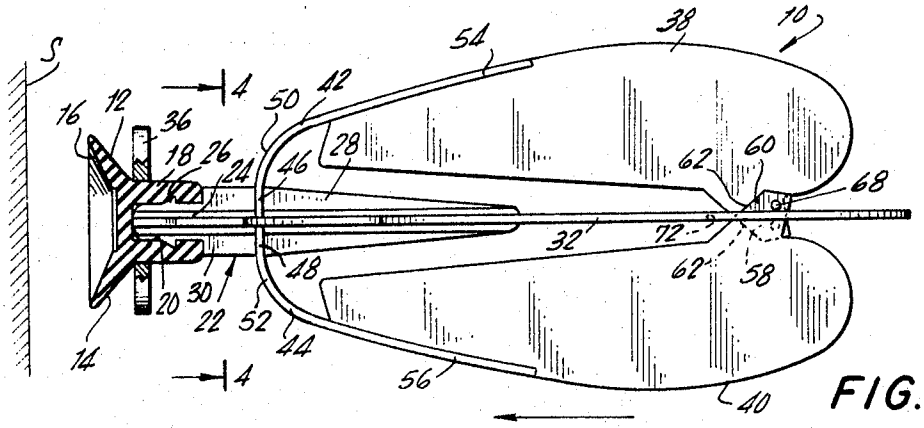


FIG. 1

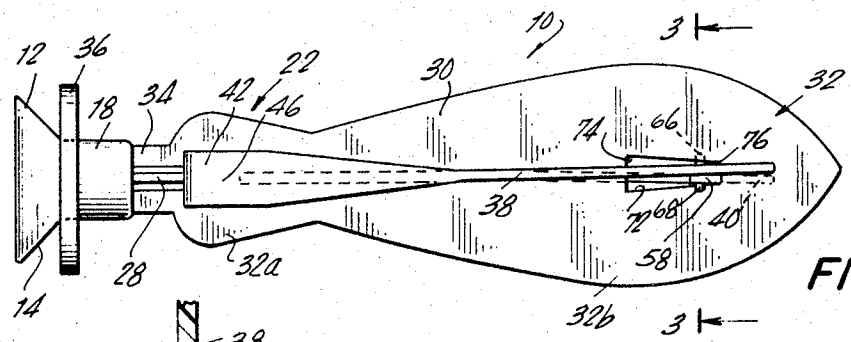


FIG. 2

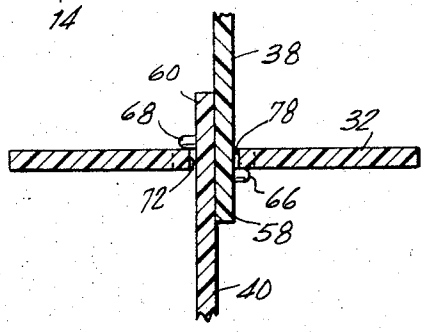


FIG. 3

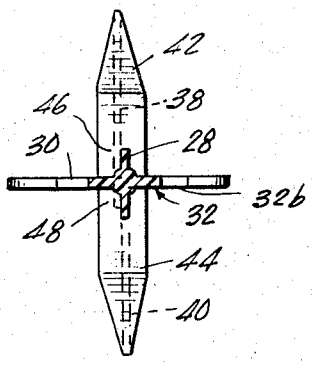


FIG. 4

INVENTORS
JULIUS COOPER
HENRY NEMETH
BY Amster & Rothstein
ATTORNEYS

July 8, 1969 J. COOPER ET AL 3,454,278

THROWING DART WITH FLY-APART WINGS

Filed Feb. 21, 1967 Sheet 2 of 2

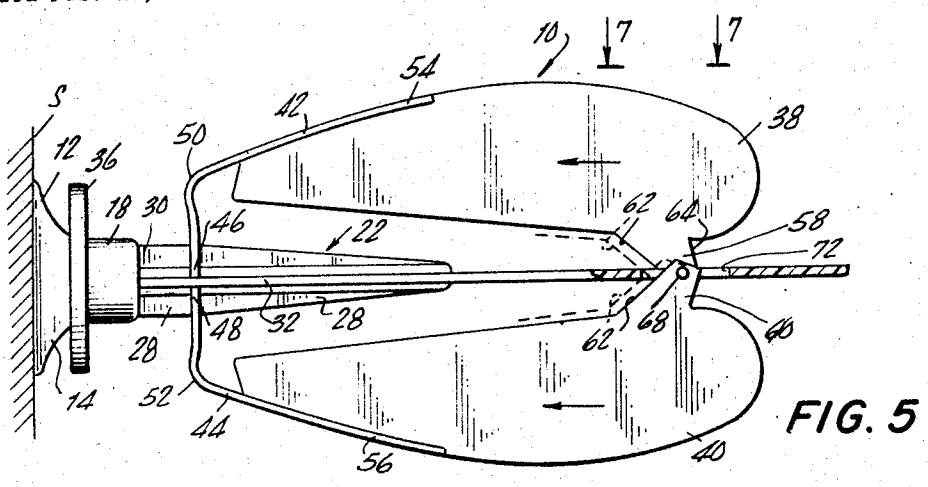


FIG. 5

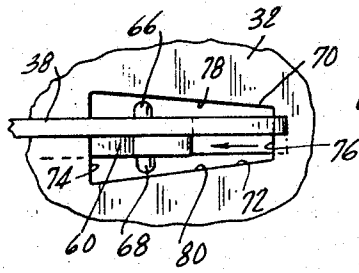


FIG. 7

FIG. 6

INVENTORS
JULIUS COOPER
BY HENRY NEMETH
Amster & Rothstein
ATTORNEYS

United States Patent Office 3,454,278 Patented July 8, 1969

3,454,278

THROWING DART WITH FLY-APART WINGS

Julius Cooper, New Hyde Park, and Henry Nemeth, Massapequa, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y., a corporation of New York

Filed Feb. 21, 1967, Ser. No. 617,599
Int. Cl. A63b 65/02; A63h 27/00
U.S. Cl. 273—106.5 8 Claims

ABSTRACT OF THE DISCLOSURE

A throwing dart having a pair of wings which are stored close to the body of the dart during flight and which fly apart to an expanded condition when the dart impacts a surface. The wings and the body carry coupling means which retain the wings close to the body when the dart is in flight. When the dart impacts a surface, the momentum of the wings causes them to shift forwardly with respect to the body, and thereupon the coupling means releases the wings so that they fly apart into their expanded positions.

It is the primary object of our invention to provide a throwing dart with fly-apart wings, the wings being stored adjacent to the body of the dart during the flight of the dart toward a target and which fly apart to an expanded condition when the dart strikes the target, thereby to amuse and entertain the user thereof.

It is another object of our invention to provide a throwing dart with fly-apart wings of the character described wherein means loosely coupling the wings is provided to retain the wings in their stored condition during flight, said means being responsive to the impact of the dart with a target to thereupon release the wings enabling the wings to spread apart to their expanded state.

It is a further object of our invention to provide a throwing dart with fly-apart wings of the character described which is few in number of parts, simple in structure, capable of being manufactured by mass production techniques and which will provide many hours of amusement to persons playing with the dart.

The above brief description, as well as further objects, features, and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a side elevational view of our throwing dart with fly-apart wings, with its wings in their contracted or storage position, the dart being shown in flight and the forward portion of the dart being shown in cross section;

FIG. 2 is a view similar to FIG. 1 but with the throwing dart rotated axially 90 degrees;

FIG. 3 is a greatly enlarged and fragmentary cross-sectional view taken substantially along the line 3—3 of FIG. 2;

FIG. 4 is a greatly enlarged and fragmentary cross-sectional view taken substantially along the line 4—4 of FIG. 1;

FIG. 5 is a view of the throwing dart similar to FIG. 1 but showing the dart at the instant it has impacted a flat surface;

FIG. 6 is a view of the throwing dart similar to FIG. 1 but showing the dart attached to the flat surface and illustrating in dash lines the position of the wings shortly after impact and in full lines the fully expanded condition of the wings; and

FIG. 7 is a greatly enlarged and fragmentary view taken substantially along the line 7—7 of FIG. 5.

Referring now in detail to the drawings, the reference numeral **10** denotes a throwing dart with fly-apart wings constructed in accordance with our invention.

The dart **10** includes as a leading member, a conventional suction cup **12** formed typically of rubber. The suction cup includes a flaring mouth **14** defining a cavity **16**. When the suction cup strikes any flat surface, the mouth **14** expands radially outwardly and some of the air from the cavity **16** is expelled. (See FIGS. 5 and 6.) Atmospheric air pressure against the external surface of the mouth **14** holds the cup **12** against the flat surface and consequently attaches the remainder of the dart to the flat surface. Although a suction cup has been described as the leading member of the dart, it is within the scope of our invention to provide a piercing member or a magnetic member as the leading element thereof. The suction cup **12** further includes a rearwardly extending collar **18** which is integral with the mouth **14** and which defines a rearwardly opening cylindrical bore **20**.

The throwing dart **10** also includes a central elongated body **22** which is coaxial with the front to back axis of symmetry of the dart **10**. The body includes a forwardly extending head **24** which is received within the bore **20** of the suction cup **12** and which carries four circumferentially spaced radially outwardly protruding prongs **26** which retain the head within the bore.

The body **22** further includes a rearwardly extending and rearwardly tapering rib **28**. The rib **28** extends only a portion of the way to the rear of the dart. The rib **28** has a forward shoulder **30** which abuts the rear surface of the collar **18** of the suction cup **12**.

The body **22** further includes a large single fin **32** which is also planar and which lies in a plane 90 degrees axially rotated from the plane of the rib **28**. The fin is best seen in FIG. 2 and includes a forward outwardly convex portion **32***a* and a larger rearward outwardly convex portion **32***b*. The fin extends completely to the end of the dart **10**, and the end of the fin constitutes the terminus of the dart. The fin **32** also has a forward shoulder **34** which abuts the rear surface of the collar **18** of the suction cup **12**. It will be appreciated that the surfaces of the rib **28** and fin **32** guide the dart during its passage in air from the hands of a thrower until it impacts any flat surface.

An annular washer **36** circumscribes the collar **18** and frictionally grips the same. Said washer gives desirable additional weight to the leading end of the dart **10**.

The dart **10** further includes a plurality of and most desirably a pair of fly-apart wings, and specifically, a first wing **38** and a second wing **40**. The wings are substantially planar and lie substantially in the same plane, on opposite sides of the fin **32**. The wings **38**, **40** are mirror images of one another and each includes an outward convex edge and an inward linear edge. The surfaces of the wings **38**, **40** also guide the dart during its flight.

Means pivots the wings **38**, **40** on the body of the dart between an initial contracted or storage position, said position being illustrated in FIG. 1, and a final expanded position, said position being illustrated in full lines in FIG. 6. Said means comprises a pair of relatively thin and rearwardly tapering mirror-image strips, a first strip **42** and a second strip **44**. Each of the strips **42**, **44**, pivotly joins a different wing **38**, **40** to a different opposed side of the body **22**. Each strip has one end, respectively **46**, **48**, joined to the body and extending generally at a right angle thereto, a middle bight portion, respectively **50**, **52**, which makes a rearward turn and another end **54**, **56** which is fixed to its respective wing. The strips **42**, **44** due to their thinness and their resiliency enable the wings to pivot with respect to the body between a position distant from one another and distant from the body **22** of the dart (the expanded position of the wings, shown in

full lines in FIG. 6) and a position adjacent one another and adjacent the body **22** (the contracted position of the wings, shown in FIG. 1). The wings rotate about parallel spaced axes perpendicular to their planar surfaces and passing through the bight portions **50, 52** of the strips.

In a desirable form of the present invention, the wings **38, 40**, the fin **32** and the rib **28** are molded in one piece from any conventional tough yet resilient synthetic plastic resin.

Means biases the wings away from one another and toward their expanded condition. Said means comprises the strips **42, 44** which, in their as molded position, hold the wings in the position shown in full lines in FIG. 6. When the wings are in their contracted storage position, as shown in FIG. 1, said strips bias the wings away from one another and away from the body to their expanded position. The strips, as will be explained subsequently in greater detail, due to their resiliency, also enable the wings to shift to a limited degree forwardly and rearwardly, that is, axially, with respect to the body of the dart.

Means loosely couples the wings in their contracted position and is responsive to impact of the dart with a flat surface to release the wings to enable them to spread to their expanded position. Said means comprises coupling members carried by both the wings **38, 40** and the body **22**. The coupling members include a pair of like radially inwardly protruding tabs **58, 60**, the tab **58** being integral with the wing **38** and the tab **60** being integral with the wing **40**. The tabs are mirror-images of one another and each includes a forward rearwardly tapering edge **62** and a rear rearwardly tapering edge **64**. As will be evident shortly, both of the forward tapering edges **62** constitute camming surfaces. Further, each of the tabs **58, 60** carries an outwardly projecting nib, the tab **58** carrying the nib **66** and the tab carrying the nib **68**. The nibs protrude away from one another from opposed surfaces of the tabs.

It was previously stated that the wings **38, 40** and the body **22** carry coupling members. The tabs **58, 60** constitute the coupling members carried by the wings. The coupling member carried by the body **22** constitutes a rearward portion **70** of the fin **32** which defines a through slot **72**, the slot being best seen in FIG. 7. The slot **72** is trapezoidal in outline and is defined by a front wall **74**, a rear wall **76** whose edge is parallel with the edge of the front wall but of shorter length, and a pair of side walls **78, 80**. The slot **72** is situated centrally along the axis of symmetry of the fin **32** and is so located on said fin that when the wings **38, 40** are adjacent the body **22** of the dart, the tabs **58, 60** are positioned to protrude through said slot. Moreover, the front wall **74** of the slot is of a sufficient width that the tabs **58, 60**, including their nibs **66, 68**, can pass through the slot (see FIG. 7).

Referring now to the operation of our throwing dart, the same is illustrated in its condition during flight in FIGS. 1 and 2, and it will be noted that the wings **38, 40** are relatively closely adjacent to the body and the tabs **58, 60** of the wings each protrudes through the slot, one tab protruding through one side of the slot and the other tab protruding through the other side of the slot. The wings are retained in this contracted position since the width of the tabs from the outside surface of one nib to the outside surface of the other nib is slightly greater than the width of the slot near the rear wall **76** and the strips **42, 44** position their respective wings so that said tabs and nibs are adjacent the rear end of said slot so that the tabs cannot move out of the slot.

When the dart is aimed at a target and thrown so that its suction cup strikes any flat surface S, this impact will abruptly halt the forward movement of the suction cup and thus abruptly stop forward movement of the remainder of the dart. However, the wings due to their own inertia will attempt to continue moving forward. Since the strips **50, 52** are somewhat resilient, the wings can move forward to a slight extent. By comparing the shape and relative location of the strips **50, 52** in FIG. 5 with the shape and location of the strips in FIG. 1, it will be evident that the strips, especially at their bight portions **50, 52**, have bent forward so that the wings and the tabs **58, 60** with their nibs **66, 68** shift forward and the nibs come into transverse alignment with a wider and forward portion of the slot **72**. When this occurs (FIG. 7), the nibs are able to pass through the slot. Then, due to the biasing action of the strips **42, 44** urging the wings apart, the wings spread apart to their expanded state.

Still another factor enables the wings **38, 40** to move apart. When the suction cup **12** impacts a flat surface and as the wings **38, 40** continue to move forward due to the inertia imparted to them, as has been said, the forward tapering edges **62** of the tabs come into contact with the front wall **74** of the slot **72**. This position of said front tapering edges **62** when impact is made is illustrated in dash lines in FIG. 5. As said front tapering edges strike the front wall **74** of the slot **72**, the tabs are cammed outwardly and are thrust apart. This aids in moving the tabs out of the slot and also aids in pushing the wings apart with a quick motion which is attractive and somewhat startling to the eyes of an observer. When the dart has come to rest with its suction cup **12** attaching it to a surface S, the strips **42, 44** hold the wings in their extended position, as shown in FIG. 6.

The dart can be easily pulled from the surface S and the tabs reinserted through the slot, so that the wings of the dart are retained once more in their contracted position.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A throwing dart including a central elongated body, means secured to the leading end of the body adapted to attach the dart to a flat surface, a plurality of fly-apart wings, means pivoting the wings on the body for movement between an initial contracted position adjacent the body and an expanded position away from the body, means biasing the wings to their expanded position, and means loosely coupling the wings to retain the wings in their contracted position during flight of the dart and responsive only to impact of the dart with the flat surface to release the wings, whereby when the dart with its wings in contracted position is thrown and impacts against the flat surface, the wings upon impact will fly apart to their expanded position.

2. A throwing dart as set forth in claim **1** wherein the pivoting means mounts the wings for axial movement with respect to the body between a forward and rearward position and holds the wings to their rearward position, and the coupling means includes coupling members carried by the wings and the body, the coupling means joining the coupling members when the wings are in their rearward position and releasing the coupling members when the wings are in their forward position, the wings being shifted to their forward position by their own inertia when the dart impacts against the flat surface.

3. A throwing dart as set forth in claim **2** wherein the coupling members constitute a tab on each wing and a rearward portion of the body defining a slot of dimensions and location to receive the tabs, the tabs being configured and arranged so that when the wings are held by the pivoting means in their rearward position, the tabs are retained in the slot, and when the wings shift to their forward position upon impact of the dart against a flat surface, the tabs are free to withdraw from the slot by the biasing means urging the wings apart.

4. A throwing dart as set forth in claim **3** wherein the tabs carry nibs to restrain their withdrawal from the slot.

5. A throwing dart as set forth in claim 4 wherein the slot is trapezoidal in shape with the shorter parallel side thereof rearward and the longer parallel side thereof forward, the nibs being of such dimension that they can pass only through the slot near the larger side thereof.

6. A throwing dart as set forth in claim 3 wherein the tabs slope rearwardly, and a forward edge of each tab abuts a front edge of the slot when the wings shift, said abutment camming the wings outwardly and apart.

7. A throwing dart as set forth in claim 3 wherein the pivoting means constitutes a plurality of resilient strips, each strip joining a different wing to the body for pivotal movement about an axis perpendicular to the longitudinal axis of the body and for movement longitudinally of the body.

8. A throwing dart as set forth in claim 3 wherein the dart includes two wings, each of said wings being planar and pivoting in substantially the same plane away from and toward one another, and the body includes a fin, said fin being planar and lying in a plane perpendicular to the plane of the wings.

References Cited

UNITED STATES PATENTS

2,136,067	11/1938	Witte	46—80
2,274,208	2/1942	Mull	273—106.5

FOREIGN PATENTS

592,059	9/1947	Great Britain.

ANTON O. OECHSLE, *Primary Examiner.*

P. E. SHAPIRO, *Assistant Examiner.*

U.S. Cl. X.R.

46—80