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BLANK TWISTABLE TO FORM A BLOWGUN DART

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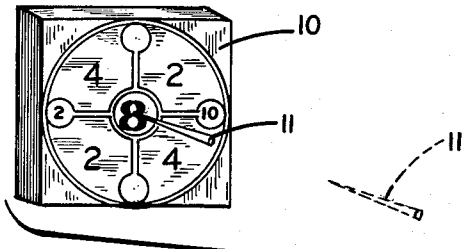


FIG. 1.

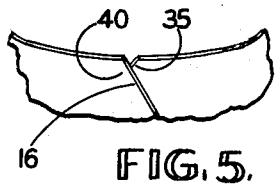
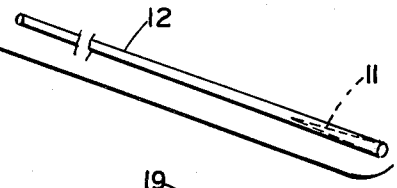


FIG. 5.



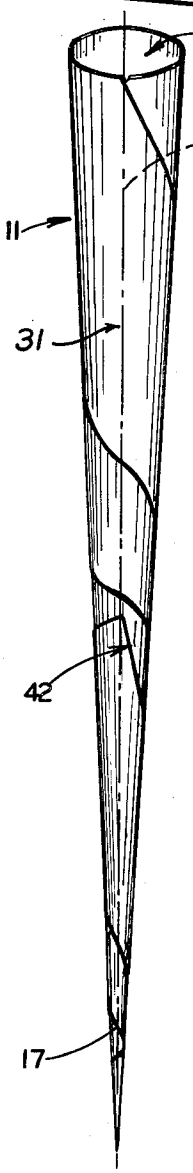


FIG. 4.

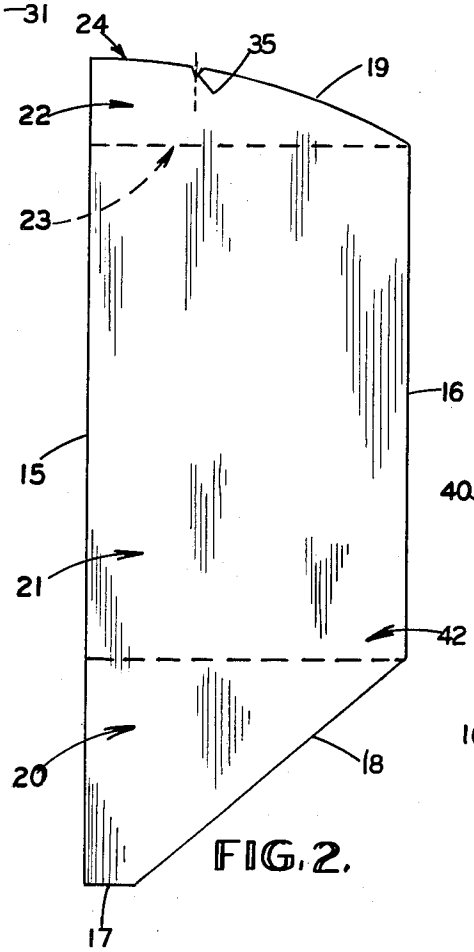


FIG. 2.

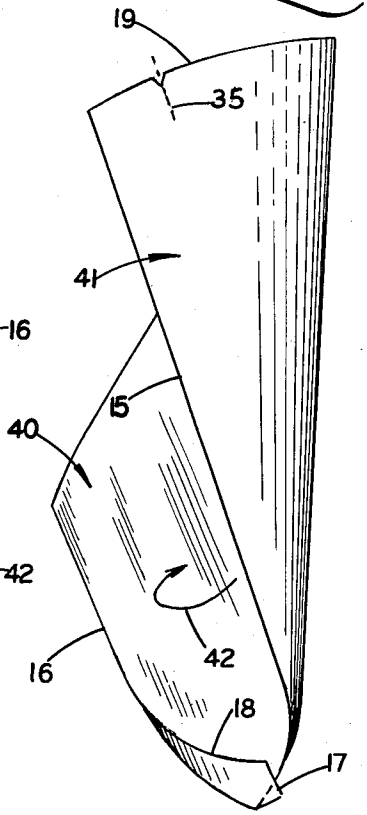


FIG. 3.

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BLANK TWISTABLE TO FORM A BLOWGUN DART

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8 Claims. (Cl. 273—106.5)

This invention relates to a game and novel articles or components used in the play thereof.

Various dart games and blowguns, etc., are known in the art; however, they are usually expensive, cumbersome, require considerable skill in their usage, and are not suitable for use by children or casual users because of their potentially dangerous character.

The present invention has been designed primarily as a children's toy, but is arranged to provide sufficient accuracy so as to be attractive to persons of all ages.

It is an object of this invention to provide a durable yet inexpensive article of manufacture adapted for easy manipulation by a user to form a dart.

It is another object of our invention to provide a strong, yet light-weight dart which may be formed from inexpensive materials such as a thin gauge sheet of paper.

Other objects and advantages will be evident to those skilled in the art from a study of the following drawings and description. In the drawings:

FIG. 1 is a perspective view of a target, darts and blowgun according to our concepts shown in the form of an exploded view;

FIG. 2 is a substantially full-scale top plan view of a paper platen adapted to be manipulated to form the hollow, conical dart shown in FIG. 4;

FIG. 3 is the platen of FIG. 2 at one stage of its manipulation to form the dart of FIG. 4;

FIG. 4 is a front elevation of a finished dart;

FIG. 5 is an enlarged, fragmentary, isometric detail of a portion of the upper periphery of a finished dart such as shown in FIG. 4.

Before describing the drawings in detail we wish it understood that they are but illustrative of possible arrangements within our concepts and that the spirit and scope of the invention should not be limited thereto but rather by the scope of the hereafter appended claims.

As shown in FIG. 1 a target **10**, a plurality of darts **11** and an elongated, tubular blowgun **12** of uniform internal diameter are the components used in the play of our dart blowgun game. The target is preferably a block of expanded cellular plastic material which is brittle yet crushable upon penetrating impact by one of the darts **11**. We prefer "Stryrofoam," the expanded cellular polystyrene manufactured by the Dow Chemical Company, because of its light weight, ready ability to be cut and otherwise fabricated to a desired shape, such as the square shown in FIG. 1, and its ability to be easily marked with inexpensive coloring materials to form a scoring target, such as the exemplary numerals and circles shown in FIG. 1, arranged in a typical pattern for scoring the game.

The blowgun **12** is preferably fabricated of a clear plastic, such as Lucite, which is light-weight yet strong, provides a passage of uniform diameter, and resists breakage due to dropping, etc. The darts **11** are formed of suitable material, preferably thin, flexible, substantially inelastic sheets of material in a novel configuration and adapted to be rapidly manipulated to form a hollow, generally conical dart such as shown in FIG. 4. A surface of the sheet may be precoated with either a soluble or pressure-sensitive adhesive, as shall become apparent hereafter. FIG. 2 is drawn substantially to full scale and shows a platen or sheet which is particularly arranged for manipulation to form a dart which is extremely stable in flight, not tending to flutter, is accurate up to 250–300 yards in relatively still air, and is adapted to cooperate with the blowgun for ease of aiming and accuracy of ejection at the target **10**.

As noted above, the sheet is preferably fabricated from thin-gauge paper and is defined by spaced substantially parallel sides of unequal length, the longer side **15** extending a relatively short distance above the shorter side **16** and a greater distance therebelow, and the bottom edge **17** is squared or substantially perpendicular to the sides. The biased side **18** joins the lower end of side **16** and the bottom edge **17** to form an inverted, generally truncated, triangular bottom portion of the sheet. The upper portions or tops of the sides **15** and **16** are joined by the upwardly inclined, convexly curving edge **19**. The so-formed sheet is comprised essentially of a lower, generally truncated, inverted triangular portion **20**, a generally rectangular central portion **21**, and an upper portion **22** which is about half the segment formed by the dotted line **23** extended to intersect the extension of regular curve **24** forming side **19**.

In our preferred construction the length of side **15** is about six and one-half inches, while the distance between the sides **15** and **16** is less than about one-half the said length of the longer side. The shorter side **16** is preferably about four inches in length and the angle of side **18** relative to an extension of side **16** is about 49°. An extension of side **18** intersects an extension of side **15** at about the same angle. The curve of side **19** is a portion of a circle having a radius of about six inches and the length of the short bottom side **17** is on the order of 5/16 of an inch. Of course, it is to be understood that variations may be had in the above dimensions and still be within our inventive concepts. However, as shall become apparent hereinafter, there is a critical relationship between these dimensions. In order to obtain a balanced dart projectile after assembly, and to overcome the tendency of erratic movement in flight, thereby providing accuracy over more extended ranges, the open end **30** of the completed dart **11** must be substantially flat, i.e., the circumferential edge thereof must be in the same plane and that plane should be substantially perpendicular to the longitudinal bisector **31** of fabricated dart **11**. The upper edge **19** and its convexly curving characteristics assure such a flat, upper circumferential edge around opening **30** after manipulation into a dart. The biased edge **18** and the short bottom edge **17** provide the proper weight distribution when the sheet has been formed into the dart, i.e., the center of gravity and greater weight is distributed forwardly of the center of the longitudinal bisector **31**, thereby providing a lighter rear portion toward the open end which acts as a tail or stabilizer in flight.

Also, in order for such an open-ended, conical dart to be positively ejected at sufficient velocity to maintain the desired stability in flight, it is necessary that the air flow induced into the blowgun **12** be substantially sealed and directed solely toward movement and discharge of the dart from the blowgun. To this end the circumferential dimension of the open end is slightly greater than the internal diameter of the blowgun **12**; but, since the dart is fabricated of paper and is relatively thin toward the open end, it is easily deformed upon insertion in the blowgun to provide a friction fit and yet rapidly restores itself to its previous shape upon discharge from the blowgun. With such an arrangement, substantially all of the air flow induced in the blowgun behind the dart is utilized for establishing a discharge velocity therefor which is sufficient to cause high velocity travel over an extended distance in stabilized and accurate flight. In order to assure that the open end is of the proper circumferential dimension to obtain the foregoing conditions of cooperation with the interior of the blowgun there are indicia **35** im-

printed or otherwise formed on the sheet adjacent the curving edge **19**. The distance from the indicia **35** to the longer edge **15** is substantially equal to one-half the circumference of the open end of a completed dart **11**.

We have provided a simple and expeditious manner for inexperienced individuals to manipulate the sheet of FIG. 2 to form the dart of FIG. 4, which is as follows. The user grasps the sheet adjacent the upper end of the short side **16** at about the portion indicated by numeral **40** while simultaneously grasping the longer side **15** at about the portion indicated by reference numeral **41** for twisting said portions relative to each other, such as indicated by the arrow **42**. This twisting is continued until the portion **40** envelops the portion **41** and is moved substantially adjacent the indicia **35**, as generally indicated in FIG. 5. While maintaining this top configuration the edge **17** is twisted around the partially formed dart and twisting continued until the completed open-ended, generally conical dart is formed, at which time the edge **17** is positioned as indicated in FIG. 4 and the portion **42**, adjacent side **16**, is positioned slightly below the horizontal bisector of the dart.

If the paper is coated with pressure-sensitive adhesive, pressure may be exerted to join the so-manipulated sheet in the form shown in FIG. 4. When using a water-soluble adhesive, overlapping edges are suitably moistened and pressed into fixed relation. When adhesive is not previously applied to the sheet it may be applied when the manipulation is concluded. Although we have found the foregoing manner of manipulating the sheet of FIG. 2 relatively easy to master, it is obvious that individual traits of various users and their degree of manual and digital dexterity may provide other suitable manipulations.

Referring again to FIG. 4, the above-noted weight distribution features of our completed dart are believed readily apparent. It is necessary to form a fine point at the lower end while obtaining this weight distribution and the biased or angled edge **18** assures this arrangement. The angle of the side **18** is critical in order that sufficient sheet material is left in the rectangular portion **21** so that the greatest weight is forward of the horizontal bisector of the finished dart and yet sufficient material is left to form the enlarged tail portion for the above noted stability in flight. Preferably, our game includes a plurality of sheets of the construction shown in FIG. 2 of various colors for ease of player identification.

We have found, surprisingly enough, that with our construction a very strong projectile results even though it is fabricated of paper. One has been tested by directing it against a hard surface, and it was found that very little damage results to the dart even though it is made of paper, as it merely bounces upon impact. At relatively short distances of about 25 to 30 feet our dart projectiles penetrate a "Styrofoam" target as above described to a distance of about ¾ of an inch without undue exertion by a user. Because of the brittle yet crushable characteristics of cellular bodies, such as our "Styrofoam" target, upon penetration by one of our darts it is frictionally engaged therein and maintained until user removal. Even when one dart strikes another they are rarely disengaged from the target. In use the player raises the blow gun having a dart positioned near the rear of the base as indicated in FIG. 1, and at eye level sights along the blowgun on the target, and while maintaining the blowgun in such position, he brings his lips adjacent the rear end of the blowgun and blows. A short duration exhalation fires the dart at the target with surprising accuracy. At distances up to 30 feet it is unnecessary to calculate trajectory and direct line aiming will give good results.

Having thus described our invention with sufficient accuracy and particularity as to enable those skilled in the art to practice it, what we desire to have protected by Letters Patent is set forth in the following claims.

We claim:

1. As an article of manufacture, a thin, flexible, substantially inelastic sheet of material adapted for twisting manipulation to form a tapering hollow dart and having substantially parallel sides of unequal length, the longer of said sides extending a relatively short distance above and a greater distance below the shorter side, a convexly curving edge extending between the top of the sides, and the lower portion of at least one of said sides extending downwardly to form a generally truncated, substantially triangular bottom portion of the sheet, whereby the larger end of the dart will lie in a plane substantially perpendicular to its lengthwise axis when the twisting manipulation is completed.

2. The article of manufacture described in claim 1 in which the distance between sides is less than about one-half the length of the longer side.

3. The article of manufacture described in claim 1 in which the inelastic sheet is fabricated of a thin-gauge sheet of paper.

4. As an article of manufacture, a thin, flexible, substantially inelastic sheet of material adapted for twisting manipulation to form a hollow, generally conical dart, said sheet having substantially parallel sides of unequal length, the longer of said sides extending a relatively short distance above and a greater distance below the shorter side, an inclined, convexly curving edge extending between the tops of the sides, and the lower portion of the longer of the sides joining a relatively short bottom edge perpendicular thereto, the shorter of said sides joining said bottom edge through a biased edge portion to form an integral inverted, generally truncated, triangular bottom portion of the sheet, whereby the larger end of the dart will lie in a plane substantially perpendicular to its lengthwise axis when the twisting manipulation is completed.

5. The article of manufacture described in claim 4 in which the biased edge portion is at an angle of about 49° relative to an extension of the shorter side.

6. As an article of manufacture, a thin, flexible, substantially inelastic sheet of material adapted for twisting manipulation to form an open-ended, hollow, generally conical dart, the sheet being of greater length than width and defined by spaced apart, substantially parallel sides of unequal length, the longer of the sides extending a relatively short distance above and a greater distance below the shorter side, a convexly curving edge extending between the tops of the sides, the lower portions of said sides joining bottom edges adapted to cooperate with said sides to form an integrally joined, inverted, generally truncated, triangular bottom portion of the sheet, there being indicia on said sheet adjacent the curving edge dividing said curving edge such that the distance from the longer edge to said indicia is substantially equal to one-half the circumference of the open end of a manipulated dart, whereby the larger end of the dart will lie in a plane substantially perpendicular to its lengthwise axis when the twisting manipulation is completed.

7. As an article of manufacture, a thin, flexible, substantially inelastic sheet of material adapted for twisting manipulation to form an open-ended, hollow, generally conical dart, the sheet being divisible into three sections consisting of a substantially rectangular center portion, an inverted, generally truncated, triangular bottom portion, and an upper portion which is substantially one-half of the segment formed by a regular curve and a chord perpendicular to the sides of the rectangular center portion, and one surface of said sheet including an adhesive coating adapted to hold a manipulated sheet in its completed, open-ended, hollow, conical dart form, whereby the larger end of the dart will lie in a plane substantially perpendicular to its lengthwise axis when the twisting manipulation is completed.

8. As an article of manufacture, a thin, flexible, substantially inelastic sheet of material adapted for twisting manipulation to form an open-ended, hollow, generally conical dart, the sheet being divisible into three sections

consisting of a substantially rectangular center portion, an inverted, generally truncated, triangular bottom portion, and an upper portion which is substantially one-half of the segment formed by a regular curve and a chord perpendicular to the sides of the rectangular center portion, and one surface of said sheet including an adhesive coating adapted to hold a manipulated sheet in its completed, open-ended, hollow, conical dart form, there being indicia on said sheet adjacent the curving portion of the upper segment adjacent the longer side thereof dividing said segment such that the distance from the longer edge to said indicia is substantially equal to one-half the circumference of the open end of a manipulated dart, whereby the larger end of the dart will lie in a plane substantially perpendicular to its lengthwise axis when the twisting manipulation is completed.

References Cited in the file of this patent

UNITED STATES PATENTS

1,346,639	Davis	July 13, 1920
1,419,554	Ganse	June 13, 1922
1,576,515	Kinney	Mar. 16, 1926
2,011,749	Brading	Aug. 20, 1935
2,504,757	Terry	Apr. 18, 1950
2,622,881	Fritsche	Dec. 23, 1952
2,819,086	Nelson	Jan. 7, 1958
2,821,397	Hartigan	Jan. 28, 1958
2,891,794	Meyer	June 23, 1959

FOREIGN PATENTS

80,971	Norway	Nov. 3, 1952