March 24, 1970 A. E. GOLDFARB ET AL 3,501,861

GAME APPARATUS AND TIME-DELAY ACTION UNIT

Filed May 24, 1968

FIG. 1.

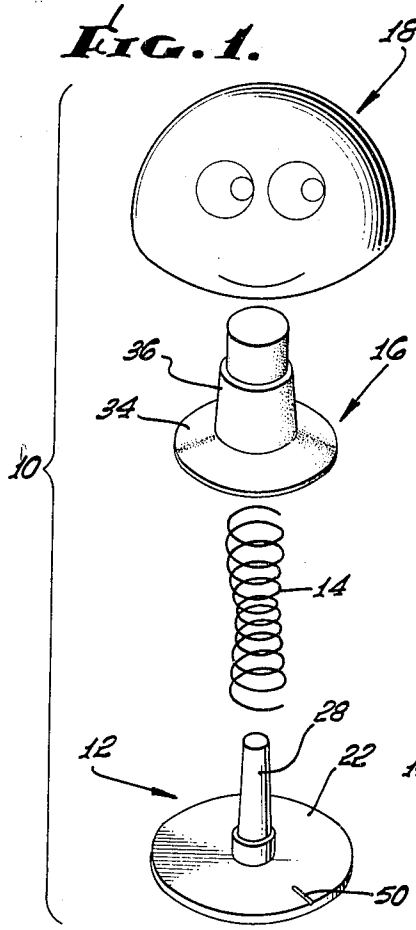


FIG. 2.

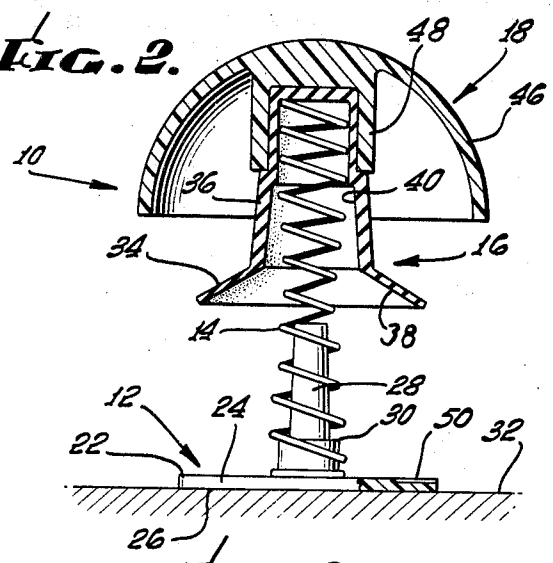
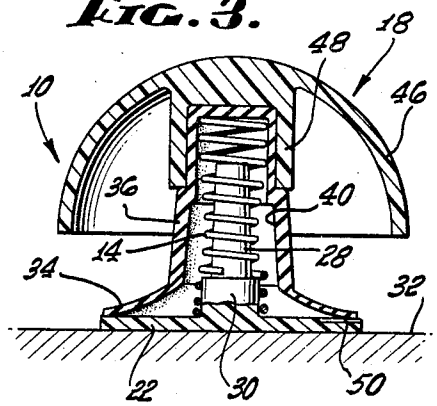
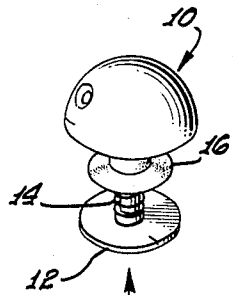


FIG. 3.





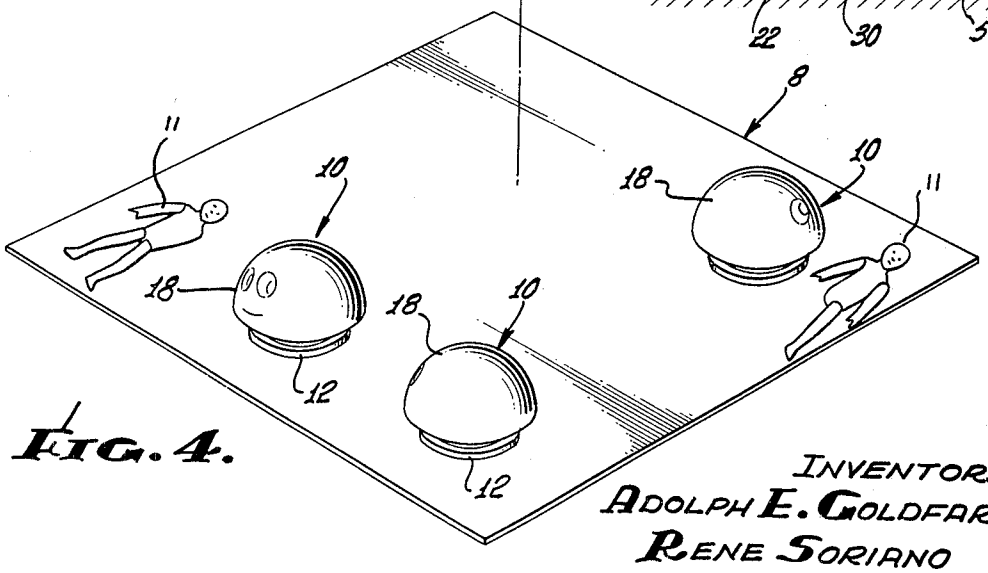


FIG. 4.

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GAME APPARATUS AND TIME-DELAY ACTION UNIT

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U.S. Cl. 46—129 10 Claims

ABSTRACT OF THE DISCLOSURE

A game played with a plurality of pop-up units which may be set, moved or shuffled around, and which will, at different time intervals, be propelled high into the air to be caught by the respective players, to start or stop time periods, or to otherwise relate to play of the game. Each illustrated unit comprises a movable base, a coil compression spring, and a suction cup element releasably engageable with the base against the force of the spring, and means for affording selected leakage of air into the set suction cup so that units will release at different time intervals.

Devices utilizing springs and suction cups for delayed-action projection of the device have not, to applicants' knowledge, heretofore been used in an action game such as is contemplated by the present invention. Further, such devices normally comprised a suction element, connected to means such as an accordion-arranged set of leave springs which directly abutted and were designed to propel the device away from the table top or floor surface that was releasably engaged by the suction cup. These devices had various disadvantages. For example, the exposed end of the spring was dangerous to the user, particularly if a small child; the device was easily damaged incident to its use; some of these devices were quite heavy (which reduced propelling height); and for certain of these devices the cost of manufacture and assembly was relatively high.

In one aspect, the present invention contemplates a spring-operated jumping toy comprising a standing base, an exterior body operatively mounted in a clearance position with respect to said standing base so as to be movable therefrom towards said standing base through a spring-loading stroke, a spring operatively arranged in an interposed position between said exterior body and standing base so as to be compressed after each said spring-loading stroke, and time-delay means operatively effective to selectively hold said exterior body after each said spring-loading stroke for a pre-determined interval, whereby upon the subsequent release of said exterior body there is also a sudden release of said spring effective to propel said jumping toy into the air.

A simple, lightweight and economical unit constructed in accordance with the present invention contemplates a movable base with an upwardly extending center post and a flat annular upwardly directed contact surface; a coil compression spring is secured on the center post and extends upwardly. A suction cup element is carried on the upper end of the spring and may be brought into releasable engagement with the contact surface of the base by pushing downwardly on the suction cup element to compress the spring. The suction cup element includes a sleeve portion extending upwardly from the center of the suction cup portion for receiving the upper end of the spring. The sleeve is imperforate and closed at its upper end to prevent air leakage into the suction cup when it is set. The flat, contact surface may be provided with means such as one or more shallow radially extending grooves to provide and control the leakage of air into a

set suction cup, to provide a predetermined time delay between setting and release of the unit. When the unit releases, the entire unit, including the base, is propelled high into the air. If desired, the suction cup element may carry suitable aesthetic, or functional play structure. For example, the suction cup element may carry a light-weight plastic dome or parachute which will tend to stabilize the projection and fall of the unit as well as slowing down its descent. The unit may be set and then slid or moved from one position to another prior to the release. There are no dangerous exposed spring ends. The unit is strong and durable for repeated use. Two or more of the units may be used in combination in the play of a game: the release of a unit may start or stop game action, or players may compete to catch the units in the air; or the place where the unit lands may be of significance to the game action.

Accordingly, it is an object of the present invention to provide a novel and improved game apparatus and method. It is also an object to provide a novel and improved time-delay action unit which has various applications and can be used in connection with such a game.

Other objects and advantages of the present invention will become more apparent from the following description and the associated drawings.

In the drawings:

FIGURE 1 is an exploded perspective view of a time-delay spring-and-suction-cup action unit which embodies features of the present invention;

FIGURE 2 is a longitudinal vertical section of FIGURE 1, showing the unit in released or non-set condition;

FIGURE 3 is a view similar to FIGURE 2, but showing the unit in the set condition;

FIGURE 4 is a schematic representation of a game including several of the illustrated units and embodying features of the present invention.

The game **8** as shown in FIGURE 4, comprises a number of individual time-delay action units **10** which in the illustrated form broadly comprise a movable base **12**, a coil compression spring **14** for projecting the unit into the air, and a suction cup element **16** for delaying the action of the spring. The illustrated units each include a body **18** in the form of a dome carried by the suction cup element **16**.

In the play of one form of the game, the players set each individual unit by pushing the suction cap element toward the base against the force of the spring and so as to compress the spring to releasably engage the suction cup element with the base. The various units may release at somewhat different times, with the release of the units being related to the play of the game. For example, the units may be of different colors which are assigned to different players, with each player having an obligation to catch his colored units when they are projected into the air. Points may be accumulated for catching or not catching the unit. Other game play activity may be going on before and after the release of the unit, as for example, activity of the players which occupies their attention and/or hands to increase the difficulty and excitement when they have to drop everything to try to catch one of their units that has released.

While the units need not be identical, the illustrated units **10** are all alike except for their color and time-delay release means, and, therefore, only one unit will be described in detail herein.

As illustrated in FIGURES 1 through 3, the base or base element **12** comprises a generally disc-shaped portion **22** having flat upper and lower surfaces **24** and **26**. The upper surface **24** comprises an annular flat contact surface or area for releasably engaging with the suction cup element **16**. The base element **12** also includes an integrally formed center post or stud **28** which extends upwardly

from the center of the disc portion **22**. The post **28** may be provided with hub means with partial thread-formations or a hub **30** integrally formed at the lower end of the post for interengagement with the coil spring **14**. The base element may be formed of any suitable material; it is desirable that it be relatively light-weight as well as durable and capable of providing an adequate contact surface **24** for the suction cup element. If desired the contact surface could be provided by a ring or disc shaped film of one material adhered to a disc portion of another material. The light weight of the base element contributes to the ability of the unit to be projected high into the air. The unit is self-standing with the disc portion **22** resting on a suitable support surface **32** such as a table top or the floor.

The spring **14** may be a conventional coil compression spring of suitable length, size and strength to impart the desired propelling action to the unit when the spring is released from a compressed condition. The lower end of the spring **14** is secured to the center post **28** of the base element **12** by interengagement with the partial thread-formations or a hub, while the upper end of the spring is secured to the suction cup element **16**. It has been found that added stability and control over the compressions of the spring can be achieved if the diameter of the spring is gradually varied over its length so that the diameter at the ends is larger than the diameter at the center. This spring configuration reduces the tendency of the spring to shift to one side when it is depressed downwardly. This added stability is particularly desirable for younger children who are able to press down on the body element but have little control over the exact direction of that pressure.

The suction cup element **16** is connected to and carried by the upper end of the spring **14**. The suction cup element **16** comprises a downwardly facing annular suction cup portion **34** integrally formed with a tubular sleeve portion **36** that extends upwardly from the center of the suction cup portion. The suction cup portion **34** may be of conventional configuration defining a suction cup recess **38** within its downwardly directed concave surface. The sleeve portion **36** is closed at its upper end and connected around its lower end to inner margin of the suction cup portion **34**. The sleeve portion **36** defines a recess or receptacle **40** in communication with the suction cup recess **38**. The sleeve recess **40** is adapted to receive the upper end of the spring **14** and securing means may be provided, such as by reducing the size of the upper end of the sleeve recess to receive the upper end of the spring in a press fit. The suction cup element may be made of a suitable flexible, resilient material such as rubber or a plastic such as polyurethane. As with the base, the suction cup element may be molded as a single part, although if desired it might be fabricated from two or more parts, so long as a suitable seal is maintained between the parts to prevent any significant air leakage into the suction cup recesses.

The illustrated unit **10** is provided with the body or body element **18** which is carried by the suction cup element **16**. The illustrated body element **18** comprises a dome portion **46** in the form of an inverted bowl, or shell of hemispherical shape. The body element further includes connector means in the form of a tubular female receptacle **48** extending downwardly from the inside center of the dome portion **46**. The illustrated receptacle **48** is integrally formed with the dome portion. If desired it could be separately formed and secured thereto. The body element **18** may be of any suitable material, with a light-weight material being desirable to faciliate high projection of the unit. The body element **18** is mounted on the suction cup element **16** by means of the upper end of the suction cup sleeve portion **36** extending into the receptacle **48** of the body element in a press fit.

The base, suction cup and body elements and the spring are designed to remain connected together incident to the operation of the unit. However, it will be noted that they may be rather easily disengaged from one another and readily re-engaged for convenience of packaging, shipment, storage and the like. This also facilitates the replacement of one part which is broken without requiring all of the parts to be replaced.

The units may be decorated in a variety of ways and the illustrated units are for example provided with an animated or lifelike appearance. Thus, for example, the body element may be formed or printed with eyes, nose and mouth as shown in the drawings to give it a lifelike quality.

To operate the illustrated unit **10**, it is merely placed on a relatively flat support surface **32** as illustrated generally in FIGURE 2, and downward pressure is exerted on the body element **18** to compress the spring **14** and urge the suction cup element **16** against the contact surface **24** of the base element **12**. The action of the suction cup element is well known, the flexible annular suction cup portion **34** being generally flattened against the annular contact surface **24** to force air out of the suction cup recess **38** and achieve a low pressure within that recess that maintains the suction cup element secured to the base element. The edge of the suction cup portion **34** provides an annular seal to maintain this pressure differential.

Without additional means, the suction cup may maintain itself adhered to a contact surface for a long period of time, depending on various factors such as the porosity of the materials, the surface finishes of the materials where they are in sealing contact, the forces tending to separate the suction cup from the surface. Such forces are exerted by the spring **14**, and by the suction cup resiliency which acts to return to its original configuration.

It is only possible, however, to control the time-delay to a limited extent by manipulating such factors relating to the loss of the pressure differential. The illustrated units **10** include means which are relatively simple and inexpensive to provide, and positively control the duration of the time-delay for each unit. It is desirable to be able to limit the durations of the time-delays so that the users do not become bored or impatient, while also effecting differences in the durations of the delay times for the various units.

As shown in the drawings, the contact surface **24** of the base element is provided with generally radially extending hairline groove **50** to permit controlled, positive air leakage into the set suction cup. The cross section of the groove **50** may vary to vary the duration of the time delay, or additional grooves may be used to provide the desired leakage cross section. Such groove or grooves may conveniently be formed in the base element when it is originally molded. Once the pressure differential is equalized to a point where the suction cup element beings to separate from the contact surface, the air rushes in to rapidly dissipate the remaining differential and the spring is released for rapid expansion. The spring reacts against the support surface to tend to propel the suction cup and body elements upwardly, and the entire unit is thereby driven high into the air by the momentum of the spring, suction cup and body elements. The unit may be used over and over again either individually or in the play of a game such as shown in FIGURE 4 where the players try to catch certain of the unit. Thus, the illustrated unit is simple and inexpensive to manufacture, assemble, store and ship. It is strong and durable, light-weight and compact, and is capable of repeatedly high projections. It is also stable for ease of setting.

In one form of the game (FIG. 4), the units **10** may be visually different as by being of different colors. Units of each color may be associated with one or more game pieces **11** of the same color. Thus, the game pieces of each color are visually different from the other game pieces. In the play of the game, the units may all be set at one time, for subsequent staggered or sequential release. As the units release and propel themselves into the air, the players attempt to catch them in mid-air. A player who

catches a unit may then manipulate a game piece of the same color. For example, the game pieces may be parts (e.g., arms, legs, body, head) of a human figure, and the game object may be for each player to assemble his own complete figure of a specified variety of colored parts, e.g., one part of each color or no touching parts of the same color.

Various modifications and changes may be made in the illustrated structure without departing from the spirit and scope of the present invention. For example, the size, shape or configuration of the body may be altered, as may that of the base disc portion. As another example, the body element and the suction cup element might be combined as a single part in some circumstances.

What is claimed is:

1. A self-standing movable time-delay jumping unit which comprises:

(1) a self-standing base element having a disc portion with an upwardly facing annular contact surface;

(2) a coil compression spring having one end connected to the center of said disc portion and extending upwardly therefrom, and

(3) a suction cup element surrounding and connected to the opposite end of the spring, and adapted to be set by being pushed downwardly to compress the spring and to releasably engage said contact surface so as to maintain that engagement against the spring within said cup element force for subsequent sudden release and propulsion of the entire unit up into the air.

2. A unit as defined in claim **1**, further including a body element carried on and secured to the suction cup element.

3. A unit as defined in claim **1**, further including a time-delay release means between the suction cup element and the contact surface for controlling the duration between setting and release of said engagement.

4. A unit as defined in claim **1**, wherein said suction cup element includes a hollow sleeve portion in which the upper end of the spring is received to connect the spring to the suction cup element.

5. A unit as defined in claim **4**, wherein said unit also includes a body element having an inverted bowl portion and a downwardly extending receptacle in which the upper end of the sleeve portion of the suction cup element is received to connect the body element to the suction cup element.

6. A unit as defined in claim **1**, wherein said spring has a relatively reduced diameter intermediate its ends to reduce undesired radial shifting of the suction cup element to one side incident to the setting of the unit.

7. A unit as defined in claim **2**, wherein said body element includes representations of life-like features.

8. A unit as defined in claim **2**, wherein the weight of said base element is no more than ⅕ of the combined weight of the spring, body and suction cup elements.

9. A unit as defined in claim **5**, wherein said base is a unitary molded hard plastic part with the connecting means being in the form of a central post having partial thread formations thereon to interengage with the spring, said body element being a unitary molded plastic part, said suction cup element being a unitary molded soft plastic part, said spring being reduced in diameter intermediate its ends.

10. A game having a plurality of individual, self-standing time-delay jumping units which each comprise:

(1) a self-standing base element having a disc portion with an upwardly facing annular contact surface;

(2) a coil compression spring having one end connected to the center of said disc portion and extending upwardly therefrom,

(3) a suction cup element surrounding and connected to the opposite end of the spring, and adapted to be set by being pushed downwardly to compress the spring within said cup element and to releasably engage said contact surface so as to maintain that engagement against the spring force,

(4) a body element carried on and secured to the suction cup element, and

(5) time-delay release means between the suction cup element and the contact surface for controlling the duration between setting and release of said engagement,

said release means providing at least two different time-delay durations so that a group of said units which have been set at approximately the same time will release at different times.

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U.S. Cl. X.R.

46—145; 273—95

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(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,501,861 Date March 24, 1970

Inventor(s) ADOLPH E. GOLDFARB and RENE SORIANO

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In Column 4, Line 52, after the words "suction cup element", the word "beings" should be --begins--.
In Column 5, line 26, after "spring" insert --within said cup element--; line 28, at the beginning of the line delete "within said cup element".

SIGNED AND
SEALED
OCT 6 - 1970

October 6, 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents