

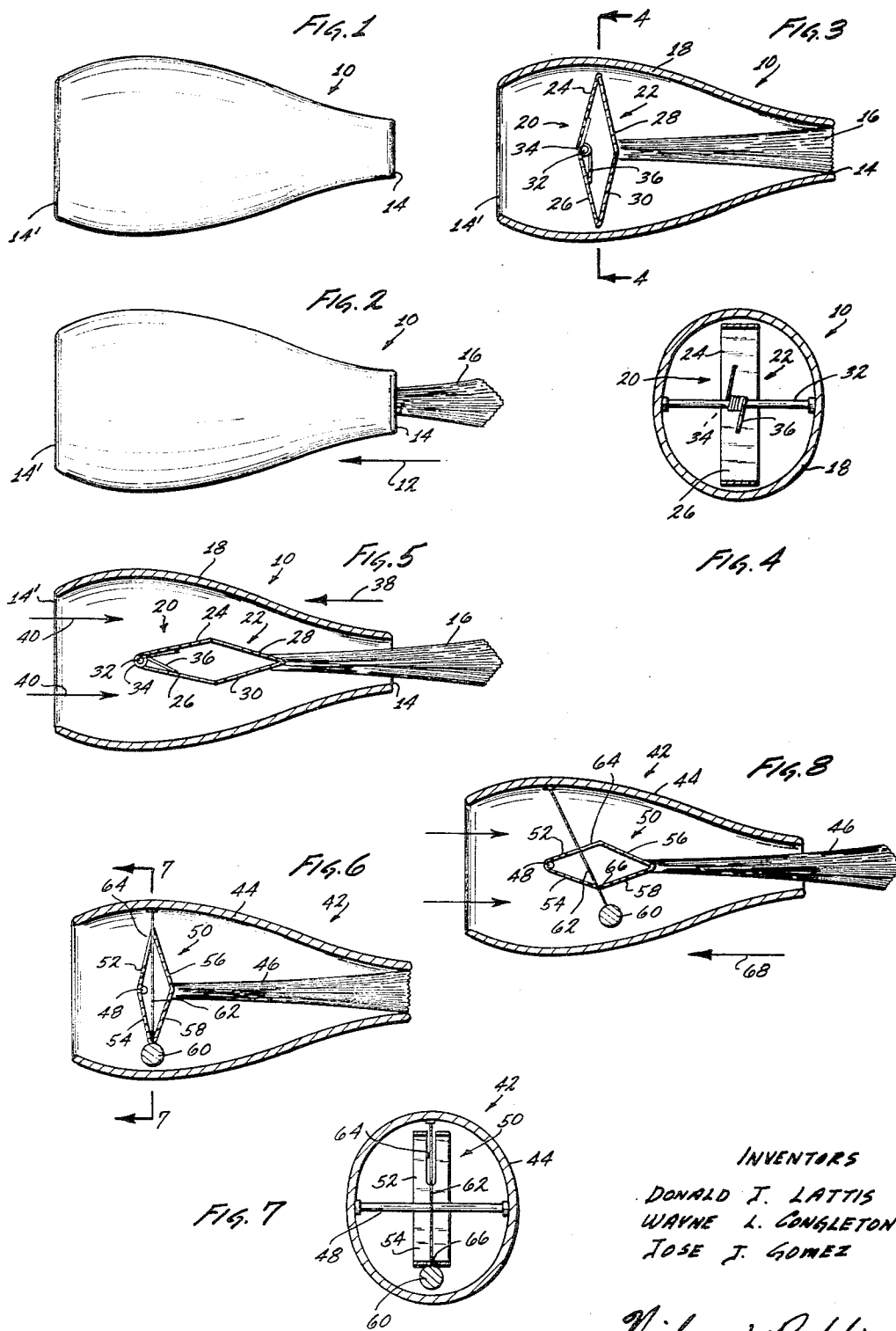
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COMBUSTION EXHAUST SIMULATOR

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1

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COMBUSTION EXHAUST SIMULATOR

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9 Claims

ABSTRACT OF THE DISCLOSURE

A device for simulating the emission of flame, exhaust fumes, heat or the like from a simulated jet, or the like, exhaust port. A plurality of suitably colored streamers are disposed within a pod-shaped housing and are caused to extend out of an exhaust port thereof by air flowing rearwardly from a front opening in the housing, or by the relative movement of a pendulum-like weight suspended within the housing, or both, in response to air velocity or acceleration. Retraction is obtained by spring force, or the like, or by the action of gravity on the pendulum-like member.

BACKGROUND OF THE INVENTION

Field of the invention

The fields of art to which pertains include the fields of air actuated amusement devices and display devices with the illusion of motion.

Description of the prior art

Devices simulating high speed and power are increasingly popular with the modern child. For example, bicycle attachments are available that whirr or roar with an intensity that increases with the speed of the bicycle. Other devices utilize flashing light to convey a sense of speed or acceleration. Still other devices adopt the stream-lined shape of a jet pod and are utilized as ornaments to visually convey a sense of jet or rocket thrust power.

Those of the foregoing devices that relate visual effect to the speed or acceleration of the device require relatively expensive mechanisms. Others of the foregoing devices, while inexpensive, do not visually portray speed or power commensurate with movement of the device. A need exists for an inexpensive device to simulate power and give a sense of speed upon movement of the vehicle to which it is attached.

SUMMARY OF THE INVENTION

The present invention is an amusement device that simulates power in such manner as to provide dramatic imagery effects not heretofore obtainable even with the most complex and costly devices. The device simulates the combustion exhaust of a jet, turbine, rocket, or the like in response to the forward movement or acceleration of the vehicle to which it is attached.

Specifically, there is provided a combustion exhaust simulating device, comprising a generally hollow housing defining an opening at a rear end thereof in simulation of an exhaust port, means for simulating combustion discharge disposed at a first position within the housing for extension through the rear opening, and means for extending the combustion discharge simulator through the rear opening in response to a forward movement of the device, retracting upon decrease of such forward movement. The combustion discharge simulator can comprise

2

a plurality of appropriately colored streamers. The extension mechanism utilizes a foldable member having a plurality of flat vanes pivotally joined in a loop and secured at a forward point within the housing so as to collapse and extend rearwardly in response to air flowing rearwardly through the housing. Alternatively, or additionally, the extension mechanism can include a weight suspended as a pendulum from a point within the housing so as to swing under the action of gravity. Upon forward acceleration, the inertia of the weight results in relative (with respect to the housing) rearward movement thereof to carry the streamers rearwardly out of the exhaust port. Retraction is accomplished by means of a spring, or the like, or by the return swing of the pendulum under the action of gravity, upon cessation of forward movement or decrease in acceleration, respectively.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a plan view of a jet-simulating pod of this invention;

FIGURE 2 is a plan view of the pod of FIGURE 1 during forward motion thereof;

FIGURE 3 is a cross-sectional side view of the jet-simulating pod of FIGURE 1;

FIGURE 4 is a cross-sectional view of the extension mechanism utilized in the device of FIGURE 3, taken on line 4—4 of FIGURE 3, in the direction of the arrows;

FIGURE 5 is a cross-sectional side view of the pod of FIGURE 3 during forward movement thereof;

FIGURE 6 is a cross-sectional side view of a jet-simulating pod utilizing an alternative mechanism;

FIGURE 7 is a cross-sectional view of the mechanism utilized in the device of FIGURE 6, taken on line 7—7 of FIGURE 6, in the direction of the arrows; and

FIGURE 8 is a cross-sectional side view of the pod of FIGURE 6 during forward acceleration thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGURES 1 and 2, a jet-simulating pod 10 is illustrated, stationary in FIGURE 1 and moving in the direction of the arrow 11 in FIGURE 2. When stationary, the device appears merely as a jet or rocket pod, tail-pipe, airscoop, exhaust vent, turbine housing, or other similar configuration. The device is mounted, e.g., by means of straps (not shown), on a bicycle, motorcycle, automobile, boat or any vehicle on which it is desired to simulate combustion exhaust.

In one embodiment, the device 10 is provided with both front and rear openings 14' and 14, respectively, the rear opening 14 simulating a jet exhaust port, and the device 10 is mounted so that air flow is created therein from the front opening 12 to the exhaust port 14. The air flow through the device 10 actuates a mechanism therein, as will be described, to project a plurality of streamers 16 from the exhaust port. The streamers are colored appropriate to the simulation of flame emission, exhaust fumes, heat, or the like. The internal mechanism is constructed so that the length of streamers emitted and resultant rate and volume of simulated emissions are proportional to the velocity of the moving stream of air through and around the device. When air flow ceases, the streamers are retracted back into the device by a mechanism herein after described.

Referring to FIGURE 3, the device 10 is shown in cross-section and comprises a generally hollow, generally cylindrical housing 18, somewhat bulged in the center in the manner of an aerodynamically designed jet pod.

At rest, the plurality of streamers 16 are disposed so that their common rearward ends lie entirely within the housing 18 flush with the exhaust port 14 thereof. The forward ends of the streamers 16 are secured, e.g., by glue, to a rear portion of an air flow-actuated mechanism 20.

The actuating mechanism 20 comprises a continuous member having two front flat vane portions 24 and 26 and two rear flat vane portions 28 and 30 joined serially to form a loop that is flexible at the joins between the flat portions. Referring additionally to FIGURE 4, a cross-rod 32 is provided across the width of the housing 18 and serves as a fixed point for the air-flow actuated mechanism 20. The two front vanes 24 and 26 of the air-flow actuated mechanism 20 are secured, e.g., by glue, at their join 34 to the cross-bar 32. A wire spring 36 is disposed on the cross-bar thereat in such manner as to bias these vanes 24 and 26 in an upright position. The effect is to draw the opposite flat portions 28 and 30 also upright, thereby defining a retracted position for the streamers 16.

Referring to FIGURE 5, when the device is put into motion, as indicated by the arrow 38, air rushes through the housing 18, as indicated by the arrows 40. The vanes 24 and 26 react against the air-flow so that when the air flow is of sufficient force to overcome the bias of the wire spring 36, the vanes 24 and 26 fold about the cross-bar 32 to become elongated along the longitudinal axis of the housing 18 while contracting in a direction transverse thereto. Elongation of the air flow-actuated member 20 allows the streamers 16 to extend rearwardly from the simulated exhaust port 14 in simulation of jet exhaust combustion.

Upon cessation of the forward movement 38 and resultant cessation of the airflow 40, the force of the wire spring 36 urges the extended member 20 back into an upright position, as in FIGURE 3, to thereby retract the streamers 16 entirely into the housing 18.

The result of the foregoing mechanism is that upon movement of the device 10 through air, colored streamers 16 are dramatically emitted from the exhaust port 14 to simulate the thrust of a rocket or jet. As the vehicle upon which the device is mounted slows down, the streamers slowly retract into the device simulating a decrease in combustion exhaust. The mechanism can utilize resilient means other than the wire spring 36 to effect retraction of the streamers. For example, a rubber band can be utilized, or the action of gravity on a displaced pendulum can be utilized as will be illustrated.

Referring to FIGURES 6 and 7, a jet pod-simulating device 42 is illustrated that is similar in exterior design to the device of FIGURES 1-5, but utilizes a different mechanism for extending and retracting its combustion exhaust-simulating streamers 46. A housing 44 is provided having a cross-rod 48 extending across its width. A foldable member 50 is provided comprising four serially connected flat portions, including two forward portions 52 and 54 and two rearward portions 56 and 58. In this regard, the foldable member is similar in construction to the foldable member 22 of FIGURES 1-5, but rather than being provided with a spring 36, the retraction mechanism in this embodiment utilizes a pendulum-like member comprising a relatively heavy weight 60 suspended by means of a string 62 from the roof of the housing 44. A slot 64 is provided in the top forward flat portion 52 of the foldable member 50 to accommodate movement of the string 62 relative thereto and a hole 66 is provided in the join between the bottom flat portions 54 and 56 adjacent the pendulum weight 60.

The device of FIGURES 6 and 7 can operate in the same manner as the device of FIGURES 1-5, that is, the foldable member 50 can be subjected to an air-flow to expand it in the direction of the exhaust port, or it can operate by an entirely different principle, not relying on the flow of air. In this latter mode of operation, the inertia of the

pendulum weight 60 is utilized for both extension and retraction of the streamers 46 upon acceleration and deceleration, respectively, of the device. Referring to FIGURE 8, upon forward movement of the device, as indicated, by the arrow 64, the inertia of the pendulum weight 60 causes it to assume a rearward position relative to the housing 44 whereupon it causes the foldable member to collapse about the cross-bar 48 and extend rearwardly along the longitudinal axis of the housing. The streamers 46 are thus extended rearwardly out of the simulated exhaust port 66. Upon deceleration, the pendulum weight 60 resumes its initial relative position, as in FIGURE 6, to set the foldable member 50 upright and thereby retract the streamers 46 into the housing 44.

The device depicted in FIGURES 6-8 can be utilized without the flow of air therethrough and, indeed, it need not have a forward opening as required for the device of FIGURES 1-5, but may rely merely on acceleration and deceleration to effectuate extension and retraction of the streamers 46. On the other hand, the device may also be utilized in conjunction with the flow of air therethrough to be responsive to both air-flow and acceleration. The pendulum weight 60 can be utilized alone for retraction purposes or in conjunction with a spring similar to the wire spring 36 of the device of FIGURES 1-5 or other resilient member.

What is claimed is:

1. A combustion exhaust simulating device, comprising:

a substantially rigid housing defining a forward opening and a rear opening and an airflow path from said forward opening through said rear opening;
means for simulating combustion discharge disposed in said airflow path at a first position within said housing for extension through said rear opening; and
means for supporting said simulating means within said housing for movement in and out of said housing, including means responsive to forward movement of said device for extending said combustion discharge simulating means along said airflow path through said rear opening and returning said simulating means back to said first position upon decrease of said forward movement.

2. The device of claim 1 wherein said combustion discharge simulating means comprises a plurality of elongated strips of flexible material.

3. The device of claim 1 wherein said extension means comprises a member collapsible so as to have a portion extend rearwardly along the longitudinal axis of said housing upon a forward movement of said device, said combustion discharge simulating means being operatively connected to said member to thereby extend through said rear opening.

4. The device of claim 3 wherein said member is foldable about a fixed point in said housing and contractable in a direction transverse to said longitudinal axis.

5. The device of claim 1 wherein said extension means comprises a member having a plurality of flat portions flexibly joined in a loop, said member being secured at a forward point within said housing and extendible rearwardly in response to said forward movement, said combustion discharge simulating means being operatively connected to said extension means to thereby extend through said rear opening.

6. The device of claim 1 wherein said extension means includes a vane pivotally secured at a forward point within said housing and rearwardly extensible by air flowing rearwardly along said airflow path, to thereby extend said combustion discharge simulating means through said rear opening, and returning to a forward position upon decrease of said airflow.

7. The device of claim 6 including spring means urging said extension means to said forward position.

8. The device of claim 6 including a weight suspended from a point within said housing so as to swing under the

5

action of gravity and operatively connected to said extension means to urge said extension means to a forward position.

9. A combustion exhaust simulating device, comprising:

a substantially rigid housing defining an opening at a rear end thereof;

means for simulating combustion discharge disposed at a first position within said housing for extension through said rear opening; and

means for supporting said simulating means within said housing for movement in and out of said housing, including a weight suspended from a point within said housing so as to swing under the action of gravity and operatively connected to said combustion discharge simulating means to extend said simulating means through said rear opening upon acceleration and return said simulating means back to said first position upon deceleration.

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