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Pneumatic Power Running Boards

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1. Title of the Invention: Pneumatic Power Running Board

2. Background of the Invention

2-1. Identification and Explanation of the Prior Arts

Note:
- Please identify the closest prior art(s) to the invention.
- Please attach a copy of the identified prior art.

Prior Art 1: 20040108678 Powered deployable running board (Decoma International Inc)

Prior Art 2: 10343610 Compact power running board (Magna International Inc)
2-2. Explanation of Drawbacks of the Prior Arts and the Object of the Invention

Prior Art 1: 20040108678 **Powered deployable running board** (Decoma International Inc)
- The design of this invention includes a spring that is connected to the retractable arm and the mount to the vehicle. This urges the running board back to its retracted state. The running board in this invention is not paired with the movement of the door, as our invention. Also, this design of the running board is limited to a step for an individual moving to/from the vehicle and does not serve any aerodynamic benefits. While our invention can move in such a way that offers additional aerodynamics. Secondly, the pneumatic motor is only used as a source of power for the running board. While our invention has the possibility to utilize the air pressure to assist in the vehicle’s suspension systems, tire pressure, and as a localized cooling system.

Prior Art 2: 10343610 **Compact power running board** (Magna International Inc)
- The invention incorporates a swing arm actuated power running board. It does claim that the actuation system could be replaced by a pneumatic motor. While our invention would be retractation/extension motion. The running board in this invention is not paired with the movement of the door, as our invention. The invention lacks to claim the utilization of the running board as additional aerodynamic component as well as using the pneumatic motor to assist in suspension systems, tire pressure, and localized cooling system.

Object of invention:

An air pump on the vehicle would control the running board and move its position using compressed air instead of an actuator. The running board would function similarly to a typical running board now. This design would extend outward when the door is opened to allow for easier mobility to and from the vehicle. The running board may also be positioned in such a way that it grants additional aerodynamic effects. The use of a pneumatic motor reduces weight of a typical actuation system and offers additional benefits that can help other aspects of the vehicle. Such as aiding in suspension system, regulating tire pressure, and overall be used as localized cooling system. The weight reduced by using pneumatic and the applicability of pressurized air to other components of the vehicle makes the design more advanced to others. The purpose is not only to make the vehicle more accessible, but also plays a supporting role in other components of the vehicle.
# Explanation of the Invention

## 3. Features of the Invention (Structures for Solving the Drawbacks of the Prior Arts)

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<td>This corresponds to “Claim” in the patent application.</td>
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<td>“Claim” is the most important matter and defines scope of protection in the patent application.</td>
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What is claimed is:

1. A pneumatic powered retractable running board for a motor vehicle, mounted underneath the frame of the vehicle offering easier mobility to/from the vehicle and better aerodynamics during driving operations:

2. a retractable arm limited in moving in a retracted and extended position, a running board connected to said arm, mounted underneath the vehicle, that can be extended from a fixed position;
3. the pneumatic motor is connected to the vehicle’s door system, that will send a signal when a door is opened, initiating the motion;
4. in fully extended position the running board is to be used as a step for the passenger that will ease the movement to/from the vehicle.
5. during driving operations, the design grants the ability to move in such a way that it would improve aerodynamics;
6. the invention may also retract to fixed position in a secure area, during harsh driving conditions;
7. the location of the pneumatic cylinder components will be attached to the vehicle body;
8. the controller that receives the signal from the door opening is tied to the pneumatic motor allowing fast transitions of the running board.

9. The air pressure of the pneumatic motor may be used to aid in the vehicle’s suspension system, tire pressure control, and be used as a method of localized cooling.

## 4. Effects (advantages) of the Invention

The invention has the use as a running board which offers easier access for the passenger to and from the motor vehicle. The pneumatic motor would receive a signal from the door, as it’s being opened, to move out of its original position. During driving operations our invention can be positioned in such a way that adds aerodynamic effects. Once the vehicle is driving in more harsh conditions the running board may be retracted fully to reduce risk of damage. By using an air compressor it’s possible to eliminate the previous actuators, thus providing a lighter weight solution. The pressurized air can also be utilized in other areas of the vehicle such as air suspension, tire pressure control, or even localized cooling. Overall this has the potential to offer multiple benefits throughout the vehicle.
5. Concrete Embodiments of the Invention

Note:
- Please attach drawings related to embodiments and explain embodiments using the drawings.
- Please write clearly the detailed structure of the invention and the operation thereof so as to enable the skilled person of this art to embody (make) the invention.
- Please write the best embodiment (best mode).
- Please write embodiments as many as possible.
- You do not have to explain the structure which is not related to the invention at all.