

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN AUTOMOBILE BODIES

(71) We, REGIE NATIONALE DES USINES, a French Body Corporate of 8/10 Avenue Emile Zola, BILLANCOURT (Hauts Seine) France, and AUTOMOBILES PEUGOT a French Body corporate, of 75 avenue de la Grande Armee, Paris, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates in general to automobile bodies and more particularly to a body specially designed for a mass produced passenger vehicle.

The trend in developing high road speeds with modern automotive vehicles, (due to mechanical improvements achieved in the motor industry and to the increment in the available mileage of motorways, speedways (and superhighways) has emphasised the increasingly predominant role played by body styling in the achievement of road stability and safety of the vehicle at high speed.

The present technical trend is directed inter alia to a gradual reduction in the vehicle weight. Now although modern vehicles have in many cases cruising speeds equivalent to those of light aircraft, a motor car remains essentially a vehicle "propelled" by the action of the driving wheels on the road surface; hence the necessity of obtaining a good road adherence.

The shapes of car bodies developed on aerodynamic principles have up to now reflected a desire to reduce the drag factor. The result has been the development of bodies having a conventional aerodynamic profile with rounded front and surfaces converging, and inclined to the rear in order to reduce head-resistance and drag. These shapes constitute a tentative approach to aircraft profiles and at high speed create a "lift" which, while constituting a desired effect on a heavier-than-air flying machine,

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is particularly detrimental to the stability of an automobile driven fast.

An attempt to reduce this effect consisted in designing passenger car bodies having "nose dive" bonnets with a view to apply an air overpressure to the surface of these bonnets so to increase the road adherence of the front portion of the vehicle.

Another attempt was made with a view to reduce the lift effect exerted on the rear portion of the vehicle by using spoilers or turbulence fins which, when mounted close to the vehicle surface, create aerodynamic turbulence tending to break down airflows away from this surface and to reduce the lift effect, as suggested for instance in the British Patent Application No. 55932/67 of 8th December 1967 (Serial No. 1215144). However, this solution is objectionable in that it increases the head resistance of the vehicle due to the increment in its frontal surface area.

Modern vehicles designed for relatively high speeds, (say above 85 m.p.h.) constitute a compromise between front nose-dive styling, concerning chiefly the bonnet and windscreen surface, which aim at increasing the road adherence, and a streamlined fastback for reducing drag. The passenger compartment or central portion of the vehicle preserves a substantially parallelepipedic configuration, with a roof sometimes slightly inclined to the rear. The maximum frontal cross-sectional area of the vehicle lies generally in a vertical plane perpendicular to the longitudinal centre line of the vehicle and intersecting this line substantially in the middle of the passenger compartment, or slightly behind the windscreen area.

The detrimental lift effects at high speed are usually compensated by the weight of the vehicle, which entails in turn a greater engine power output. This leads to the manufacture of so-called sports cars of

SPECIFICATION AMENDED - SEE ATTACHED SLIP

generally high cost and therefor limited diffusion.

The invention provides an automotive vehicle body, having a general configuration comprising two opposed irregular frustums of pyramids with non-parallel bases and joined at their major bases, one frustum having an elongated shape converging to the front to constitute a passenger compartment and front portion of the vehicle, its minor base constituting a front face and its major base providing the greatest cross-sectional area of the vehicle body, which is located substantially at the rear of said passenger compartment, the other frustum being shorter and converging sharply to the rear, with its minor base constituting a rear end face of the vehicle and its major base coplanar with that of the one frustum aforesaid, the perimeter of this major base following a contour generally parallel to that of the major base of said one frustum but slightly recessed in relation thereto in order to provide a continuous, angular shoulder along the perimeter of the major base of said one frustum on faces corresponding to a roof and to the upper portion of side panels of the body.

According to one feature of the invention the said two frustums together define a third irregular squat frustum of a pyramid having non-parallel bases with its minor base constituting the roof of the passenger compartment and its major base providing the greatest horizontal cross-sectional area of the vehicle, said major base lying in a substantially horizontal plane adjacent the base or lower edge of the car body.

Preferably the surfaces constituting the top of the front portion, a windscreen, the roof of the passenger compartment, the upper portions of the side panels of the passenger compartment and of the side panels of the front portion, are inclined and converge in the forward direction.

Preferably the line of the upper and side surrounds of a rear window forms an angle with the surfaces of the roof and of the side panels of the passenger compartment, the upper and side surrounds lying in a plane substantially parallel to the plane containing the major bases of the said two opposed frustums.

According to another feature of the invention aeroflow extractors or vents communicating with the passenger compartment are disposed just behind the aforesaid sharp-edged shoulder, in the depression zone created thereby.

According to yet another feature of the invention the surfaces formed between the said windows surrounds and the plane containing said major bases are inclined and converge to the rear.

The surface elements of the vehicle body

are preferably plane or slightly curved.

As a result of this novel combination of shapes the surfaces of the bonnet, windscreen, passenger compartment's roof and upper side panels of the front portion and of the passenger compartment converge forwards and receive during the drive a pressure due to the air-resistance which tends to press the vehicle against the road surface. This pressure is inasmuch efficient as it is exerted on a large surface area. Moreover, the pressure exerted on the side panels has a horizontal component perpendicular to the longitudinal centre line of the vehicle, which counteracts the effects of eddies and side wind on the stability of the vehicle while reducing the resistance to these effects due to the inclination of said surfaces.

The sharp-edged shoulder corresponding to the maximum cross-sectional area of the vehicle produces a turbulent air flow reinforced by the sharp angle between this shoulder and the adjacent rear window parallel to said shoulder, thus breaking air flows of the rear portion and reducing the lift effect produced by this portion. This effect is further reduced by the pronounced convergence of the surfaces of said rear portion.

The aeroflow vents or extractors from the passenger compartment open into the depression area behind said sharp-edged shoulder and assist in providing an efficient ventilation of the passenger compartment.

The inclination of the upper portion of the side panels is attended by a recessed position of the side edges of the roof, thus facilitating the access to the passenger compartment.

As this body shape has its widest portion nearly coplanar with the rear wheel axes; the rear track can be increased with respect to the front track, thus ensuring an improved stability and wheel adherence, notably when negotiating turns or on muddy or snow-covered roads.

The rearward rising canopy increases the headroom and therefore the comfort of rear seat passengers.

Finally, this body shape, from which all rounded pressings are strictly precluded, and comprising only flat surfaces or at the most very slightly curved surfaces, eliminates costly deep pressings and therefore this body can be constructed economically under mass-production conditions to which it is perfectly adapted.

It is therefore obvious that with this combination it is possible to construct a mass-produced vehicle capable of extremely lively performances heretofore reserved for considerably more expensive cars.

Safety is increased by the great structural rigidity resulting from the pyramidal shapes and their high crushing strength.

A typical form of embodiment of a body according to this invention will now be described in more detail by way of example with reference to the accompanying drawings, in which:—

Figure 1 is a side elevational view of a vehicle with a body constituting the subject-matter of this invention.

Figure 2 is a plan view from above of the same body.

Figure 3 is a front view of the vehicle, and

Figure 4 is a perspective view of the vehicle.

Referring first to Figure 1, it will be seen that the dash and dot lines drawn around the body designate the irregular front frustum of a pyramid, constituting a passenger compartment and front portion for the vehicle, of which frustum the minor base is the front face 1 and the major base 2 provides the maximum cross-sectional area of the vehicle which lies in the plane P_1P_1 . The dot and dash lines also designate the rear irregular frustum of a pyramid of which the major base lies in the same plane P_1P_1 and the minor base in the rear end face 3. The rear frustum is shorter than the front frustum. The two said frustums together define a third irregular squat frustum of a pyramid of which the minor base is the roof of the passenger compartment 4 and the major base provides the maximum horizontal cross-sectional area as visible in Figure 2, this base lying in a substantially horizontal plane P_2P_2 disposed adjacent the base of the body.

The roof 4 of the passenger compartment, the windscreen 5, and the bonnet 6 are all inclined forwards, as shown. The bonnet 6 constitutes the upper part of the front portion.

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In the plane P_1P_1 the body panels form a sharp-edged shoulder 7 facing to the rear and covering the upper portion of the passenger compartment with lateral extensions on either side. Aeroflow extractors or vents 8 are positioned just behind said shoulder 7.

An edge 9 connecting the passenger compartment to the rear window 10 forms another sharp-edged shoulder slightly behind the shoulder 7 and substantially parallel thereto. Surfaces 11 formed between these two shoulders are inclined and converge to the rear. Surfaces 12, 13, 14 and 15 of the rear portion of the body are also strongly inclined and converge to the rear.

Surfaces 16 and 17 formed by the upper side panels of the front portion of the vehicle and of the passenger compartment are in-

clined upwards and converge in a forward direction, as shown.

When the vehicle is driven at high speed, an air pressure gradient develops along the surfaces 4, 5, 6, 16 and 17, of which the vertical component tends to press the vehicle against the road surface. Along the edge 7 a turbulence sheet develops which is reinforced by the action produced by the edge 9 between the surface 11 and the rear window 10, in order to cause break-away of the air flow likely to exert a lift effect on the rear portion of the vehicle.

The lack of surface discontinuity outside the shoulders 7 and 9, and the gradual and continuous slopes of the body surface panels assist in imparting to the assembly a stable aerodynamic condition substantially insensitive to variations in environmental conditions.

As already pointed out hereinabove, various modifications may be brought to the body design and to its specific proportions as illustrated and described herein, without inasmuch departing from the scope of the invention as set forth in the appended claims.

WHAT WE CLAIM IS:—

1. An automotive vehicle body, having a general configuration comprising two opposed irregular frustums of pyramids with non-parallel bases and joined at their major bases, one frustum having an elongated shape converging to the front to constitute a passenger compartment and front portion of the vehicle, its minor base constituting a front face and its major base providing the greatest cross-sectional area of the vehicle body, which is located substantially at the rear of said passenger compartment, the other frustum being shorter and converging sharply to the rear, with its minor base constituting a rear end face of the vehicle and its major base coplanar with that of the one frustum aforesaid, the perimeter of this major base following a contour generally parallel to that of the major base of said one frustum but slightly recessed in relation thereto in order to provide a continuous, angular shoulder along the perimeter of the major base of said one frustum on faces corresponding to a roof and to the upper portion of side panels of the body.

2. A vehicle body according to claim 1, in which the said two frustums together define a third irregular squat frustum of a pyramid having non-parallel bases with its minor base constituting the roof of the passenger compartment and its major base providing the greatest horizontal cross-sectional area of the vehicle, said major base lying in a substantially horizontal plane adjacent the base or lower edge of the car body.

3. A vehicle body according to claims 1



A typical form of embodiment of a body according to this invention will now be described in more detail by way of example with reference to the accompanying drawings, in which:—

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Figure 2 is a plan view from above of the same body,

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2. A vehicle body according to claim 1, in which the said two frustums together define a third irregular squat frustum of a pyramid having non-parallel bases with its minor base constituting the roof of the passenger compartment and its major base providing the greatest horizontal cross-sectional area of the vehicle, said major base lying in a substantially horizontal plane adjacent the base or lower edge of the car body.

3. A vehicle body according to claims 1



or 2, in which the surfaces constituting the top of the front portion, a windscreen, the roof of the passenger compartment, the upper portions of the side panels of the passenger compartment and of the side panels of the front portion, are inclined and converge in the forward direction.

4. A vehicle body according to any one of the preceding claims, in which the line of the upper and side surrounds of a rear window forms an angle with the surfaces of the roof and of the side panels of the passenger compartment, the upper and side surrounds lying in a plane substantially parallel to the plane containing the major bases of the said two opposed frustums.

5. A vehicle body according to any of the preceding claims, in which aeroflow extractors or vents communicating with the passenger compartment are disposed just behind the aforesaid angular shoulder, in the depression zone created thereby.

6. A vehicle body according to claim 4, wherein the surfaces formed between the said window surrounds and the plane containing said major bases are inclined and converge to the rear.

7. A vehicle body according to claims 1, 2, 3, 4 and 5 wherein surface elements of the vehicle body are planar or slightly curved.

8. A vehicle body substantially as described hereinabove with reference to and as shown in the accompanying drawings.

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