

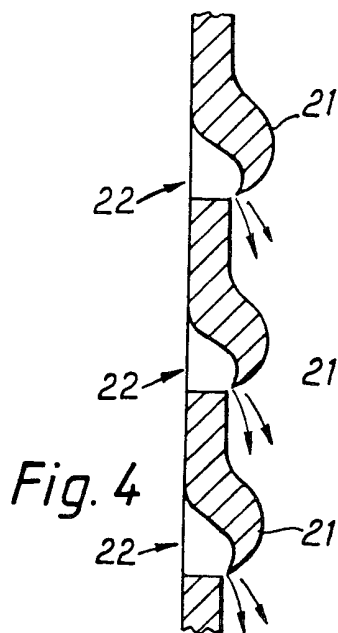
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(54) Vehicle anti-spray attachment

(57) The anti-spray device comprises one or more panels constructed so as to allow the through passage of air but to restrict or prevent the through passage of particles of water. In an embodiment each panel is formed with dimples 21 which stand proud and are such that at least part of their periphery is spaced from the panel to provide an aperture for indirect through flow of air and water droplets. In another embodiment the panel may comprise a porous foam material.



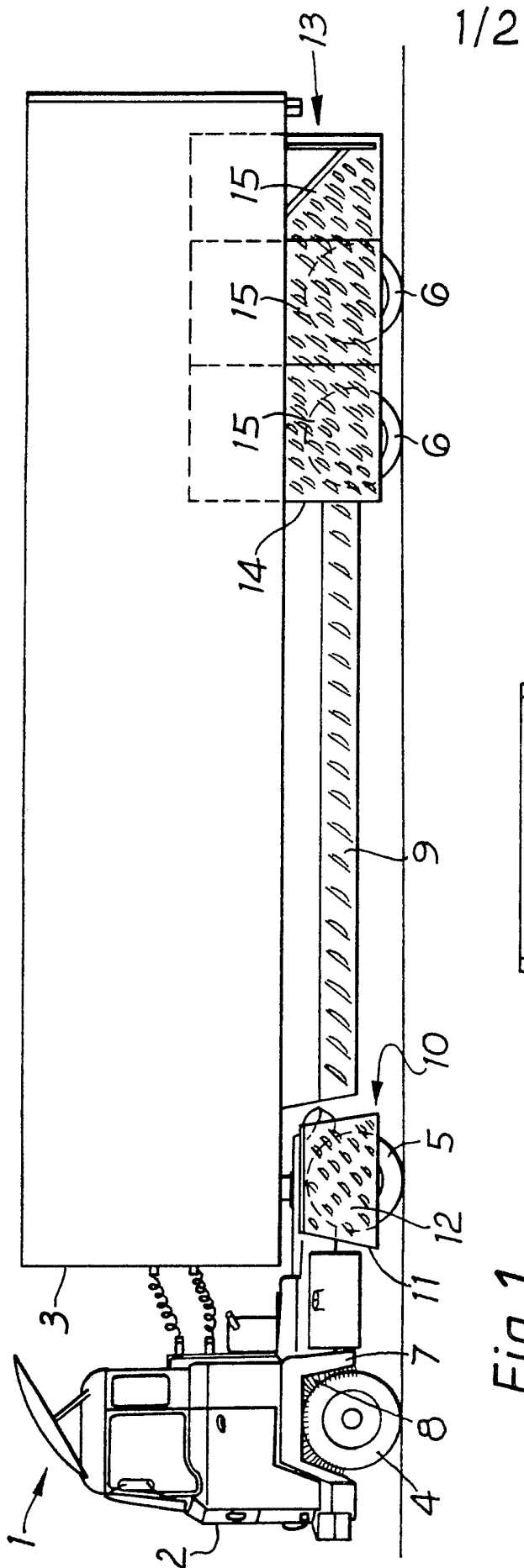


Fig. 1

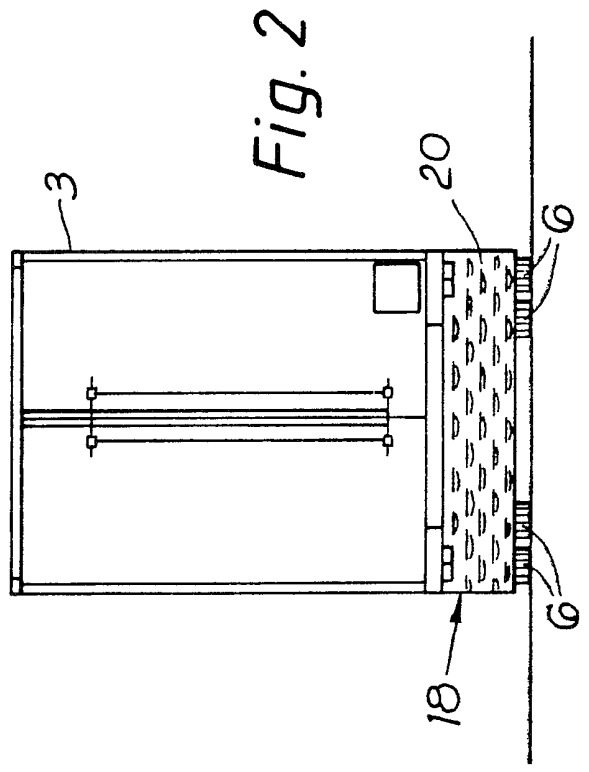


Fig. 2

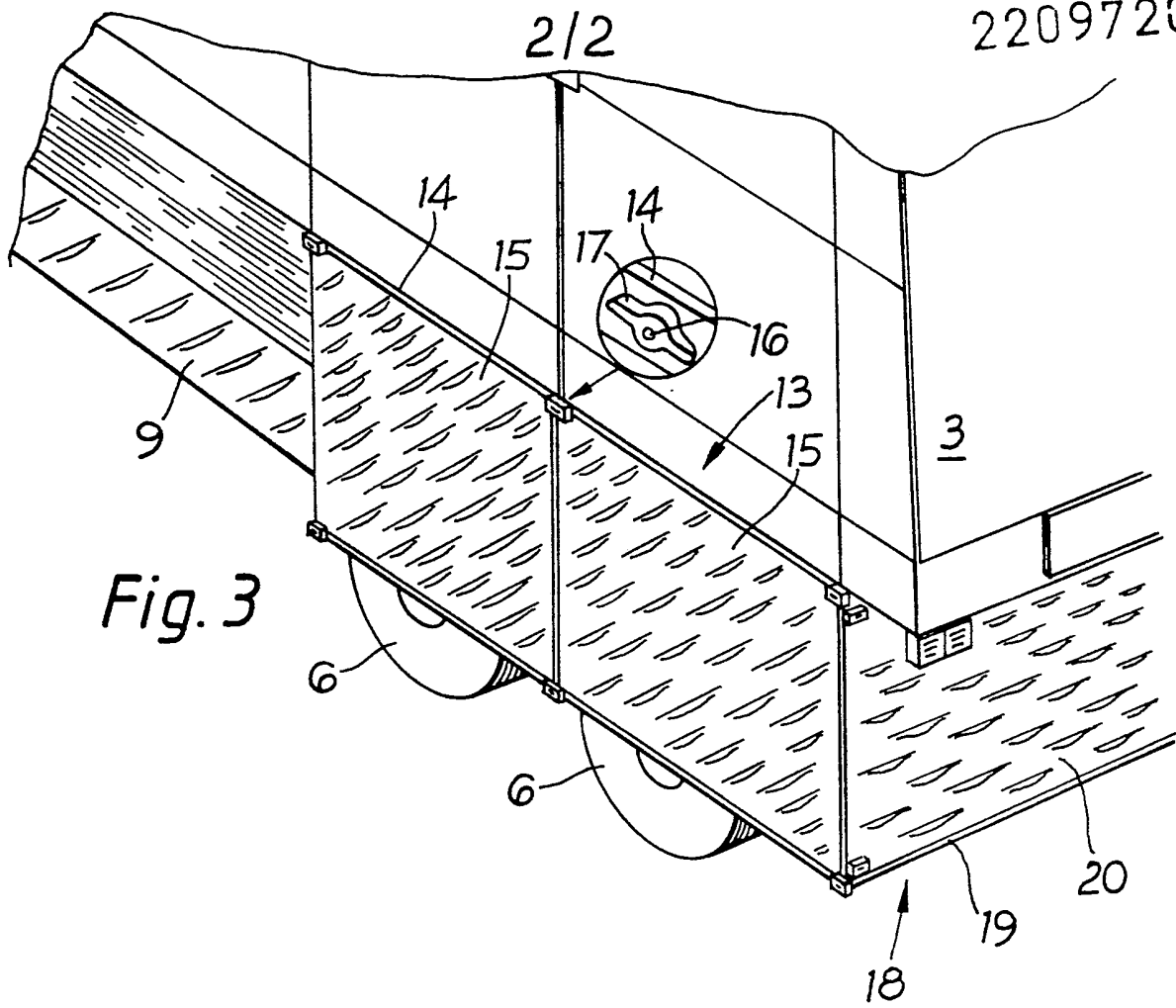


Fig. 3

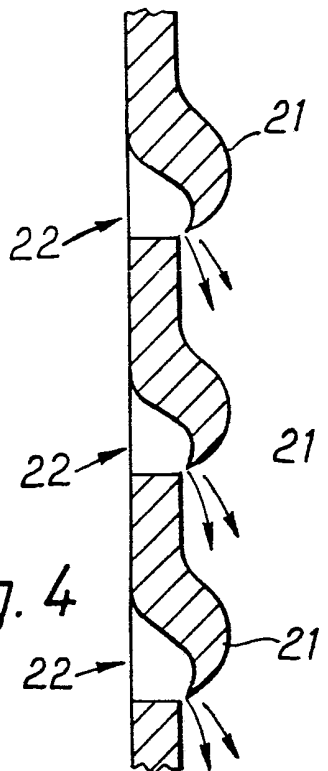


Fig. 4

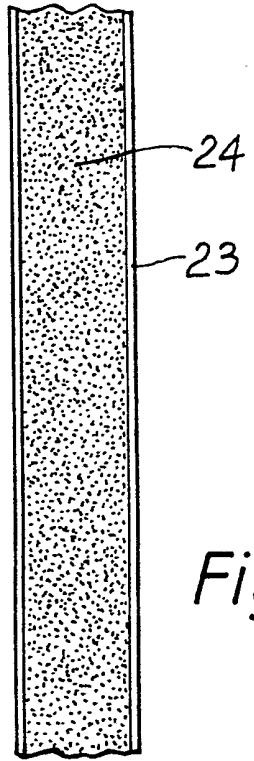


Fig. 5

VEHICLE ANTI-SPRAY ATTACHMENT

This invention relates to an attachment for road vehicles aimed at reducing the spray created by that vehicle travelling along a wet road surface.

It is well known that any vehicle travelling along a road having a wet surface will create a spray of fine particles of water, whereby a "mist" is created at least to the rear of the vehicle and very often also to the sides of the vehicle. This "mist" can represent a very serious driving hazard, especially on motorways when vehicle speeds are significantly higher than those on other types of highway. The amount and spread of the "mist" created by a vehicle travelling along a road with a wet surface is a function of the speed of the vehicle and the problem is particularly associated with heavy goods vehicles (HGV's) which, as a generality, tend to have road wheels which are totally exposed in side view. An HGV has large diameter road wheels, with a correspondingly relatively wide width and a vehicle fitted with twin rear axles with a pair of wheels at each end of the axle, picks up a relatively large amount of water from a wet road surface, whereby the "mist" created by that vehicle is relatively large and virtually prevents a driver of another vehicle immediately behind or overtaking from having any significant visibility for a certain period of time which can have catastrophic, if not fatal, results. Accordingly, there is a dire need for the "mist" created by all vehicles, but especially HGV's to be reduced or eliminated. The "mist" created by a normal automobile represents a much reduced hazard to other road users because the road wheels are of much smaller diameter and width and furthermore, most automobiles have only partially exposed road wheels when seen in side view so that the "mist" is to some extent contained.

It is an object of the present invention to obviate the above mentioned problem.

According to the present invention there is provided an anti-spray device for a road vehicle comprising one or more panels constructed so as to allow the through passage of air but to restrict or prevent the through passage of particles of water, the or each panel being provided with means for attaching the same to a road vehicle.

Preferably, a framework is provided for the or each panel by which the device is attachable to a road vehicle, the form of attachment conveniently being releasable so that the device may be removed when not required for use. Alternatively, the device may be adapted for movement between an inoperative and operative position on the vehicle so as to avoid complete removal when not required for use.

The or each panel may be made of a fibrous synthetic plastics material which is porous as regards the through flow of air but essentially non-porous as regards the through passage of particles of water. This material is particularly convenient in as much as it is corrosion resistant and lightweight and it is found that water particles sprayed on to the surface of the or each panel adjacent a wheel of a road vehicle is condensed or formed into droplets of water at, or just under, the surface of the or each panel and the droplets then run therefrom to the ground, thus eliminating all spray beyond the confines of the vehicle and thus removing the hazard to other road users discussed above.

Alternatively, the or each panel may be formed from a sheet of material which is provided with a plurality of apertures such that there is no direct passage for particles of water from one side of the panel to the other in a direction substantially at right angles to the plane of the panel. This may be achieved by forming

apertures with axes inclined to the plane of the panel at an angle other than 90° or thereabouts. Alternatively, dimples can be punched into the panel with an opening provided at the edge of each dimple so that any particles of water hitting the surface of the panel from which the dimples are punched will condense into droplets and the latter may run off the panel either on that same side or on the opposite side having passed through the openings provided by the dimples. As before, such an arrangement eliminates the fine spray or "mist" of water particles which would otherwise occur at the sides and rear of a vehicle, giving rise to the hazard referred to.

An anti-spray device for a heavy good vehicle will now be described in greater detail, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a side elevation of the vehicle,

Figure 2 is a rear view of the vehicle,

Figure 3 is a perspective view, to a larger scale, showing a portion of the rear and one side of the vehicle of Figure 1,

Figure 4 is a partial cross-section of the device, and

Figure 5 is a partial cross-section of an alternative device.

The HGV is indicated generally at 1 and comprises a tractor 2 and a trailer 3, the trailer being releasably hitchable to the tractor in a conventional manner. The tractor 2 is provided with a pair of front, steerable, ground-engaging wheels 4 and a pair of rear ground-engaging wheels 5. The trailer 3 is of the double-axle type and thus has two rear axles to the end of each of which is fitted a pair of ground-engaging wheels of which only the outside wheels 6 are seen in the drawings. It will be observed that the rear tractor wheels 5 and the rear trailer wheels 6 are entirely exposed as seen in side view and the front tractor wheels

3 are only partially obscured by a form of mud guard 7 fitted with bristles 8.

The description so far relates to a conventional HGV which, when travelling on a wet road surface will produce both to the sides and the rear of the vehicle a spray or "mist" of water particles extending for several feet from the vehicle and thus effectively reducing visibility to zero for the driver of a vehicle which is close to the HGV, this being especially so when the speed of the HGV is relatively high such as is achieved on motorways.

A number of anti-spray devices, constructed in accordance with the invention, are fitted to the vehicle and there is first provided a permanently fixed skirt or panel 9 which extends from the forwardmost rear wheels 6 of the trailer to a point short of the front of the trailer and which is closely adjacent the rear edge of the rear tractor wheels when the trailer is hitched to the tractor. Such a skirt 9 is provided at each side of the trailer.

A further anti-spray device indicated generally at 10 is provided on each side of the tractor adjacent the rear wheels 5 thereof, this device comprising a frame 11 to which is fitted a panel 12 of a form to be described hereinafter.

Towards the rear of the trailer 3 on each side thereof, there are fitted further anti-spray devices as indicated at 13, each of these comprising a frame 14 to which three panels of material 15 are fitted. The trailer 3 is fitted with threaded spigots 16 which pass through apertures in the frame 14 and which receive wing nuts 17 so as releasably to attach the frame to the trailer. As indicated in Figure 1 of the drawings, each device 13 may be swung from the operative (full line) position to an inoperative (broken line) position if desired, or can be arranged to slide between the operative and inoperative positions. It should be noted

that, for convenience, Figure 3 of the drawings only illustrates two panels 15 associated with each device 13 as opposed to the three panels 15 shown in Figure 1.

Finally, a further device 18 is provided at the rear of the vehicle, this device comprising a frame 19 to which is fitted one or more panels 20. The device 18 is releasably attachable to the vehicle in the same manner as the devices 13 except that it is not possible to move this device to an inoperative position except by removing it entirely from the trailer 3.

The panels 10, 12, 15 and 20 of the various anti-spray devices described are each formed in the same manner. Each panel is in the form of a sheet of material which is preferably corrosion resistant and lightweight and thus may be of a synthetic plastics material or aluminium, for example, and is formed with a multitude of dimples 21 (Figure 4) which stand proud of the panels on the surface thereof remote from the wheels of the HGV with which they are associated. The dimples are so formed that at least part of their periphery or edge is spaced from the panel so as to provide an aperture 22 for the indirect through flow of air and the indirect through flow of droplets of water. The general form of the panels is illustrated in Figure 4 of the drawings which shows a partial cross-section of a panel.

When the vehicle is travelling along a wet road surface, the wheels thereof pickup water from the road and throw it into the air in the form of very fine particles which in normal circumstances, as described above, are thrown to the rear and sides of the vehicle but in the present case these particles hit the inside surfaces of the various panels 10, 13, 15 and 20 and are thereby condensed into larger droplets of water which run down the panels and are finally discharged to ground, principally on the inside surfaces of the panels but inevitably some of the droplets will be carried by the

through flow of air to the other side of the panel through the openings afforded by the dimples. However, these droplets too fall to the ground and are not issued in the form of the hazardous "mist" which would otherwise be the case. Thus, the anti-spray devices adjacent the tractor and trailer wheels 5 and 6 and to the rear of the vehicle play the greatest part in eliminating side and rear spray of fine water particles but the skirts 9 beneath the trailer 3 also serve to prevent any such spray as a result of water thrown to the rear by the rear tractor wheels 5.

The panels 10, 12, 15 and 20 may each be in the form of a lightweight frame 23, stressed as required, holding a sheet 24 of a porous foam material such as 10 ppi filter foam, for example, as illustrated in Figure 5 of the drawings.

It will thus be seen that the present invention affords a significant advance in the art of eliminating, or at least very significantly reducing, the spray to the sides and rear of vehicles, especially HGV's, such that the hazard otherwise created thereby to other road users is removed. The anti-spray devices are both robust and lightweight so that they do not give rise to any weight penalty in as much as they amount to an insignificant proportion of the total weight of a vehicle, especially HGV's, and the devices are readily removed or rendered inoperative if that is preferred when travelling on dry road surfaces. Anti-spray devices which are made removable can also be made collapsible so that they can be stowed in or on the tractor or in the trailer for use whenever required during a journey. An advantage resulting from the use of anti-spray devices in accordance with the present invention is that when they are in their operative positions, they increase the ground effect of the vehicle and yet they do not give rise to any undue build-up of air pressure in as much as

air can flow through the panels of the devices so that air pressure which does exist beneath the vehicle will not prove damaging to any structure, such as the anti-spray devices themselves, and air flow will take place so that any brake cooling which such air flow normally effects is not affected.

CLAIMS

1. An anti-spray device for a road vehicle comprising one or more panels constructed so as to allow the through passage of air but to restrict or prevent the through passage of particles of water, the or each panel being provided with means for attaching the panel to a road vehicle.
2. A device according to claim 1, wherein the or each panel comprises a framework by which the panel is attachable to a road vehicle.
3. A device according to claim 1 or 2, wherein the or each panel is releasably attachable to a road vehicle.
4. A device according to claim 1 or 2, wherein the or each panel is adapted for movement between an inoperative position and an operative position, whereby it need not be removed from the vehicle when not required for use.
5. A device according to any of the preceding claims, wherein the or each panel comprises a fibrous synthetic plastics material which is porous as regards the through flow of air but substantially non-porous as regards the through flow of particles of water.
6. A device according to any of claims 1 to 4, wherein the or each panel comprises a sheet of material provided with a plurality of apertures such that there is no direct passage for particles of water from one side of the panel to the other in a direction substantially at right angles to the plane of the panel.
7. A device according to claim 6, wherein the or each panel comprises a sheet of 10 ppi filter foam.
8. A device according to claim 6, wherein the apertures have axes inclined to the plane of the panel.
9. A device according to claim 6, wherein the apertures are formed by dimples having an opening provided at an edge thereof.
10. An anti-spray device for a road vehicle

substantially as herein particularly described with reference to the accompanying drawings.

11. A vehicle fitted with an anti-spray device in accordance with any of the preceding claims.