

Personal Protection

5 This invention relates to personal protection for infants.

10 The invention is concerned especially with affording infants protection against air pollution when for example in a pram, baby-buggy or carry-cot.

15 Babies and other infants when transported in a pram, baby-buggy or carry-cot in the street are often exposed to air that is polluted with high levels of motor-vehicle exhaust fumes. The levels of pollution to which they are exposed are generally higher than those experienced by adults since the infant breathes air from a lower level, closer to the source of emission of the fumes into the atmosphere. The matter is of particular concern because
20 an infant is physically less able even than an adult to cope with pollution and is more likely to develop respiratory disorders from exposure to exhaust fumes, and it is one of the objects of the present invention to provide equipment by which such exposure can be reduced.

25 According to the present invention there is provided equipment for affording an infant protection against ambient-air pollution, wherein a compartment for enclosing the infant involves a base-support which is of
30 a configuration to support the infant in an appropriate sitting or other posture within the compartment, and a canopy that is transparent throughout at least a substantial part thereof, for extension over the infant on the base-support to close-up the compartment except to
35 the extent of leaving one or more openings to the ambient atmosphere, and wherein the equipment also includes means carried with the base-support for blowing filtered



ambient-air into the compartment at a location spaced from said one or more openings to create positive pressure in the compartment relative to the ambient air-pressure with the filtered air flowing lengthwise of the infant on the base-support.

The canopy may extend fully over the base-support, and may comprise flexible transparent sheeting supported on arched stays that are pivotable for selective extension of the canopy over the base-support. An element of mesh may be inset into the canopy for venting air from the compartment and avoiding build up of heat within the compartment.

The base-support, which may be mounted on a wheeled chassis, may be of an elongate dished configuration and may be suspended within an open frame element that carries the canopy. More particularly, it may include a substantially-rigid panel that is suspended on fabric sections which define walls of the base-support; one of the sections may provide a seat for the infant, with the panel as backrest.

For seating the infant, the base-support may be mounted to have an inclined attitude, and in these circumstances the means for blowing the filtered ambient-air into the compartment may be mounted at the upper, head end of the base-support to blow the filtered air to flow downwardly of the base-support within the compartment. In the latter circumstances, an opening of said one or more openings may be located towards the lower, foot end of the base-support; the canopy may in this regard extend over the base-support and hang open beneath it.

The means for blowing filtered air into the compartment may comprise a filter and a battery-powered electric fan for drawing ambient-air through the filter. The filter



may include a dust filtrant for removing particulates from the ambient-air.

5 A baby-buggy equipped in accordance with the present invention to afford an infant protection against ambient-air pollution, will now be described, by way of example, with reference to the accompanying drawings, in which:

10 Figure 1 is a general perspective view of the baby-buggy according to the invention;

15 Figure 2 is a schematic illustration showing operation of equipment of the baby-buggy of Figure 1 for affording an infant protection against ambient-air pollution; and

Figure 3 is a perspective view of the seat-unit of the baby-buggy of Figure 1 adapted for use as a carry-cot.

20 Referring to Figure 1, the baby-buggy has a tubular-metal chassis 1 that is fitted with a tubular-metal handle 2 for pushing and manoeuvring the buggy on the wheels 3 of the chassis 1. An elongate seat-unit 4 for supporting the infant in a sitting or reclining posture, is mounted on a generally-elliptical frame 5 that is hung within the
25 chassis 1 from two diametrically-opposed pivot mounts 6.

To the extent the buggy has so far been described it is of a generally conventional form, and any infant carried in it near motor vehicles would, because of his/her
30 location low down, be closely exposed to exhaust-fume emissions from those vehicles. The buggy of the present invention, however, acts to minimise such exposure, and in this respect incorporates a transparent plastics-sheeting canopy 7 that in conjunction with the unit 4
35 defines a compartment 8 to enclose the infant. A powered filter-unit 9 mounted on the frame 5 blows filtered air into the compartment 8 to ensure that the compartment 8

is kept substantially free of pollution, for protection of the infant.

The powered filter-unit 9 includes, as illustrated in Figure 2, a fan 10 that is powered from a rechargeable or standard battery 11 to draw ambient-air through a filter 12 and blow it into the compartment 8 at the head of the unit 4. The filter 12, which includes a dust-filtrant and polyurethane foam impregnated with carbon spheres or carbon-impregnated cloth, is effective to remove pollutants (particulates, together with carbon-, nitrogen- and sulphur-dioxide, and hydrocarbons) to a substantial extent from the ambient-air so that the filtered air blown into the compartment 8 defined within the canopy 7, is of significantly-enhanced breathability.

The canopy 7 is made up of three flexible gores 13 to 15 and an apron portion 16 all of clear polyvinyl chloride sheets that are sewn and sealed together on three flexible rods or stays 17 to 19. The stays 17 to 19 are arched with the two ends of each pivoted to the frame 5 to enable them to be opened out from one another to stretch the sheeting of the gores 13 to 15 taut and close-up the compartment 8. In this respect, the gore 13 is attached to the unit 9 and also to the frame 5, but the canopy 7 is otherwise free of close attachment below this so that the apron portion 16 hangs round, but spaced from, the infant's legs and lower part of the body; provision may be made for securing the sheeting of the apron portion 16 to the chassis 1 to maintain the spacing, if necessary. The lack of sealing and the spacing of the apron portion 16, ensures that the compartment 8 as a whole is adequately ventilated. However, additional ventilation is provided through a mesh inset 20 in the gore 14 above the infant's head. The inset 20 also provides a degree of shading from the sun; in inclement weather a rolled-up cover 21 attached

to the gore 14 can be unrolled and secured across the inset 20 to protect the infant.

5 The possibility of entry of ambient, polluted air into the compartment 8, is obviated by operating the unit 9 to maintain a positive pressure within the compartment 8 with respect to the ambient air-pressure. The filtered-air outlet 22 of the unit 9 is set back slightly over the infant's head at the top of the compartment 8, and waste
10 air is vented to atmosphere through the open lower-part of the canopy 7 provided by the apron portion 16, so that a good air-flow is established downwardly of the infant's face and body. The added, balanced ventilation through the mesh-inset 20 helps further to ensure that there is
15 no build up of carbon dioxide, or of heat, within the compartment 8. The filter 12 opens from the top of the unit 9 away from the discharge of air through the mesh 20, and the unit 9 incorporates indicators 23 and 24 for showing respectively the state of charge of the battery
20 11 and air flow into the compartment 8 so as to enable operation of the equipment to be readily monitored. Provision may also be made for an audio alarm that warns when the state of charge of the battery 11 is low.

25 The seat-unit 4 has a substantially rigid back formed by a fabric-covered panel 25 that is suspended within the frame 5 by top and bottom sections 26 and 27, and two side-wall sections 28, all of fabric. The section 27 provides the seat of the unit 4, and the panel 25 is
30 tipped slightly forward within the frame 5 by lugs 29 (Figure 2) that latch to the frame 5, so that the section 26 above the infant's head is angled back slightly to the unit 9. The lower portions of the side-wall sections 28 rise up either side of the panel 23 to afford arm
35 restraint and side-protection for the infant seated on the panel 25 within the unit 4. The orientation of the unit 4 as a whole on the chassis 1 can be adjusted

between that suitable for the infant to sit up (as illustrated) or to recline backwardly for sleep.

- According to an advantageous feature of the buggy, seat-unit 4 can be readily adapted for use in the form of a carry-cot mounted substantially horizontally on the chassis 1; the age range for which the buggy can be utilised is thereby extended to cover the period before the infant can sit. For such use the lugs 29 are unlatched from the frame 5 so that, as illustrated in Figure 3, the panel 25 hangs on the fabric section 27 and side-wall sections 28, flat with the section 26 within the frame 5. The infant is placed on the panel 25 within the unit 4 with its head towards the section 27 and feet extending towards the unit 9. The unit 9 is operated in the same manner as previously described to maintain a positive air pressure within the compartment, but the canopy 7 is replaced by a canopy 30.
- The canopy 30 has three transparent gores 31 to 33 with a mesh inset 34 for enhanced ventilation in the gore 33. However, instead of having an apron-opening around the section 27, the canopy 30 has a fabric gore 35 that attaches to the frame 5. Adequate ventilation is provided even when the inset 34 is covered by its rolled-up cover 36, through holes 37 in the gore 35. The holes 37 ensure that there is good flow of air over the infant from the unit 9.
- The seat-unit 4 when configured as in Figure 1 for sitting or reclining, or as in Figure 3 as a carry-cot, may be removed from the chassis 1, for use independently thereof. There is no disturbance to the unit 9 in this or any other use, so operational effectiveness and integrity in keeping the infant's environment substantially free from the ambient-air pollutants, is maintained.

Although the invention has been described above in terms of protection against traffic-produced pollution, it may also be used to protect infants against pollen and other allergens in the atmosphere.



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Claims:

1. Equipment for affording an infant protection against ambient-air pollution, wherein a compartment for enclosing the infant involves a base-support which is of a configuration to support the infant in an appropriate sitting or other posture within the compartment, and a canopy that is transparent throughout at least a substantial part thereof, for extension over the infant on the base-support to close-up the compartment except to the extent of leaving one or more openings to the ambient atmosphere, and wherein the equipment also includes means carried with the base-support for blowing filtered ambient-air into the compartment at a location spaced from said one or more openings to create positive pressure in the compartment relative to the ambient air-pressure with the filtered air flowing lengthwise of the infant on the base-support.
2. Equipment according to Claim 1 wherein the canopy comprises flexible transparent sheeting supported on arched stays that are pivotable for selective extension of the canopy over the base-support.
3. Equipment according to Claim 1 or Claim 2 wherein the canopy extends to cover the base-support fully.
4. Equipment according to any one of Claims 1 to 3 wherein the base-support is of an elongate dished configuration and is suspended within an open frame element that carries the canopy.
5. Equipment according to any one of Claims 1 to 4 wherein the base-support is mounted on a wheeled chassis.

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6. Equipment according to any one of Claims 1 to 5 wherein the means for blowing filtered air into the compartment comprises a filter and a battery-powered electric fan for drawing ambient-air through the filter.

7. Equipment according to Claim 6 wherein the filter includes a dust filtrant for removing particulates from the ambient-air.

8. Equipment according to any one of Claims 1 to 7 wherein the base-support is mounted to have an inclined attitude for seating the infant, and the means for blowing filtered ambient-air into the compartment is mounted at the upper, head end of the base-support to blow the filtered air to flow downwardly of the base-support within the compartment, and wherein an opening of said one or more openings is located towards the lower, foot end of the base-support.

9. Equipment according to Claim 8 wherein the canopy extends over the base-support to hang open beneath it as an apron for the infant's legs.

10. Equipment according to any one of Claims 1 to 9 wherein the base-support includes a substantially-rigid panel that is suspended on fabric sections that define walls of the base-support.

11. Equipment according to Claim 10 wherein one of said fabric sections provides a seat for the infant with the panel as backrest.

12. Equipment according to Claim 10 or Claim 11 wherein an element of mesh is inset into the canopy for venting air from the compartment.

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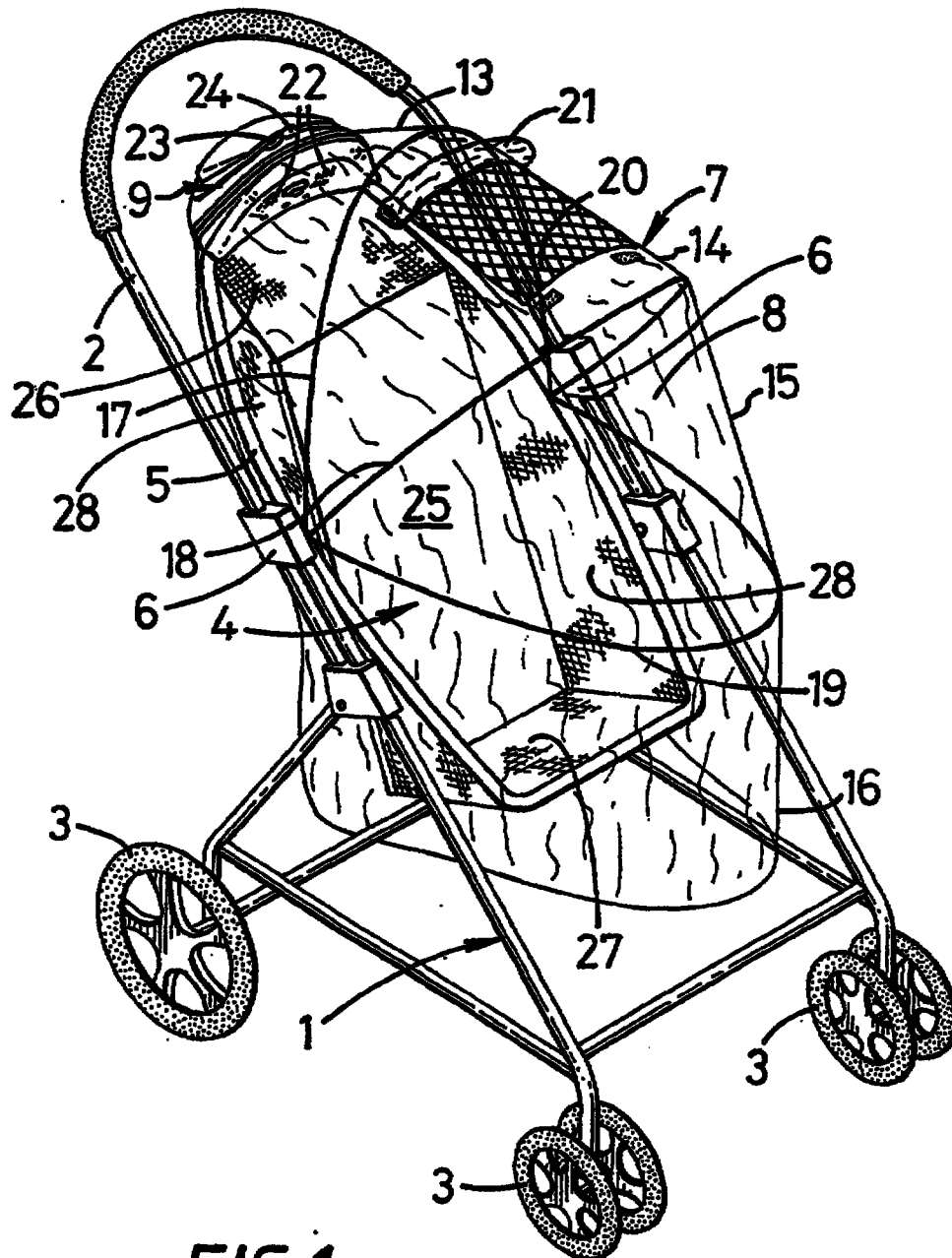
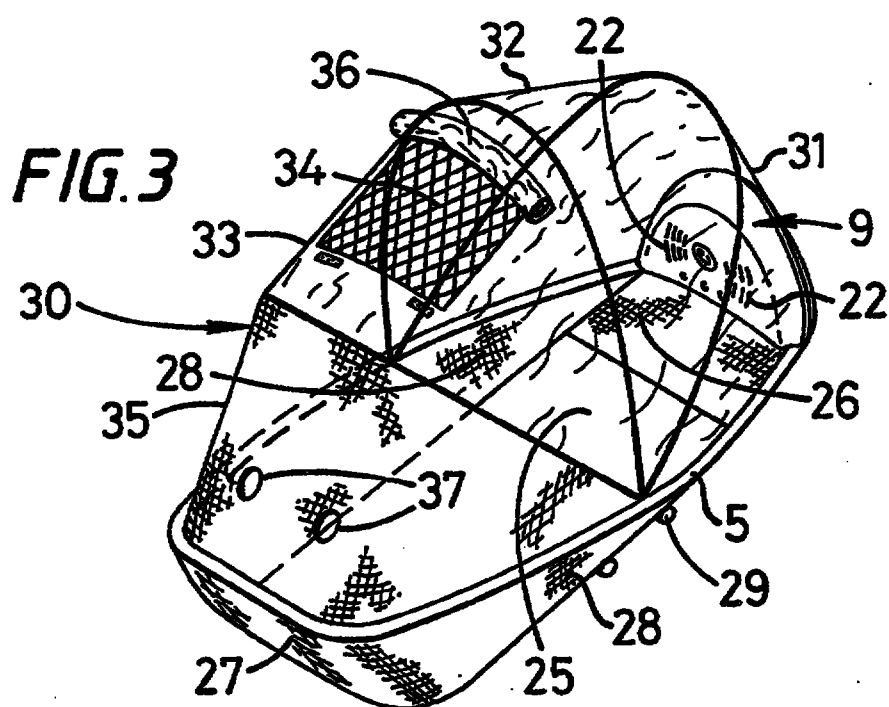
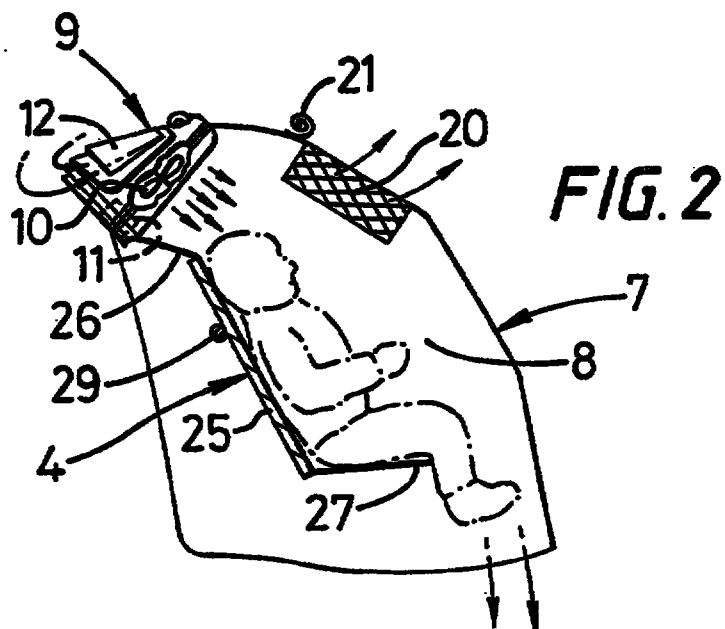
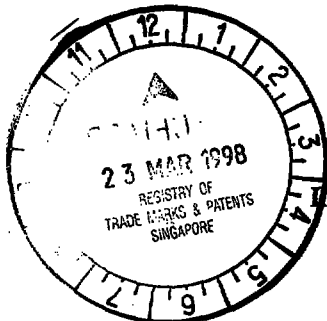


FIG. 1

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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT 01 OCT. 1997

(PCT Article 36 and Rule 70)

WIPO PCT

Applicant's or agent's file reference PA/GL95 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 96/ 01348	International filing date (day/month/year) 07/06/1996	Priority date (day/month/year) 07/06/1995
International Patent Classification (IPC) or national classification and IPC B62B9/14		
Applicant KUESTER, Stephen Michael		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consists of a total of 5 sheets.

3. This report contains indications and corresponding pages relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 07/01/1997	Date of completion of this report 29.09.97
Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer  A.M. BRAUER Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/GB96/01348

I. Basis of the report

1. This report has been drawn up on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*

☐ the international application as originally filed

☒ the description, pages 3 - 7, as originally filed
 pages, filed with the demand
 pages 1, 2, 2a, filed with the letter of 01.07.97

☒ the claims, Nos., as originally filed
 Nos., as amended under Article 19
 Nos., filed with the demand
 Nos. 1 - 12, filed with the letter of 01.07.97

☒ the drawings, sheets / fig. 1/2 - 2/2, as originally filed
 sheets / fig., filed with the demand
 sheets / fig., filed with the letter of

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.
- ☐ the drawings, sheets / fig.

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2 (c)).

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty	Claims	1 - 12	YES
	Claims		NO
Inventive Step	Claims	1 - 12	YES
	Claims		NO
Industrial Applicability	Claims	1 - 12	YES
	Claims		NO

2. Citations and Explanations

The nearest prior art is disclosed in D1 (DE-A-4 241 233).

There is no hint in the available prior art as to a ventilating system blowing filtered air in a lengthwise direction of a supporting frame of a baby-cot, which frame is taking a baby in a sitting or lying position.

The advantage over D1 is a good air circulation by avoiding stagnation due to the positioning of the in and outlets of the ventilating system.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The text of Claim 1 is not sufficiently supported by the description, since not all the openings are situated on the opposite side of the frame with respect to the air-blowing input.

There it is suggested to introduce into the main claim the feature of the description page 4, lines 24-31, stating that the main outlet is around the one end of the frame as an apron-like part of the canopy which freely hangs round the frame.

Without sufficient support by the description, an objection may be raised concerning either a lack of clarity or an extension beyond the original disclosure.

Personal Protection

5 This invention relates to personal protection for infants.

The invention is concerned especially with affording infants protection against air pollution when for example in a pram, baby-buggy or carry-cot.

10 Babies and other infants when transported in a pram, baby-buggy or carry-cot in the street are often exposed to air that is polluted with high levels of motor-vehicle exhaust fumes. The levels of pollution to which they are
15 exposed are generally higher than those experienced by adults since the infant breathes air from a lower level, closer to the source of emission of the fumes into the atmosphere. The matter is of particular concern because an infant is physically less able even than an adult to
20 cope with pollution and is more likely to develop respiratory disorders from exposure to exhaust fumes.

Equipment for affording an infant protection against ambient-air pollution in a pram is known from
25 DE-A-4241233 and involves a portable unit containing an air-filter and a motorised fan, that attaches to the side of the pram. The hood of the pram is raised and a transparent sheet is used to close off the inside of the pram from the ambient atmosphere. Filtered air supplied
30 from the unit is blown into the interior of the pram through the sheet near the top of the hood, via a hose connection. Although air outlets are provided in the sheet for ventilation, they are located where the sheet covers the opening to the hood and not spaced
35 significantly in relation to the infant from where the air enters through the hose-connection. There is accordingly the problem of the likelihood of air

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stagnation within the pram, and the consequent danger that the filtered air will not reach the infant; this problem is increased by the high location of the hose-connection in the hood.

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It is an object of the present invention to provide equipment for affording an infant protection against ambient-air pollution, that reduces to a significant extent the likelihood of air stagnation.

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According to the present invention there is provided equipment for affording an infant protection against ambient-air pollution, in which a compartment for enclosing the infant involves an elongate base-support which is of a configuration to support the infant in an appropriate sitting or other posture within the compartment, and a canopy that is transparent throughout at least a substantial part thereof, for extension over the infant on the base-support to close-up the compartment except for at least one or more openings at which the compartment is vented freely to the ambient atmosphere, and in which the equipment also includes motorised means carried with the base-support for blowing filtered ambient-air into the compartment at a location spaced from said one or more openings to create positive pressure in the compartment relative to the ambient air-pressure, the equipment being characterised in that the motorised means is located at one end of the base-support for blowing the filtered air into the compartment to flow towards the other end lengthwise of the infant on the base-support, and that said one or more openings are located towards or at said other end of the base-support.

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The canopy may extend fully over the base-support, and may comprise flexible transparent sheeting supported on arched stays that are pivotable for selective extension of the canopy over the base-support. An element of mesh

may be inset into the canopy for venting air from the compartment and avoiding build up of heat within the compartment.

- 5 The base-support, which may be mounted on a wheeled chassis, may be of an elongate dished configuration and may be suspended within an open frame element that carries the canopy. More particularly, it may include a substantially-rigid panel that is suspended on fabric
10 sections which define walls of the base-support; one of the sections may provide a seat for the infant, with the panel as backrest.

- For seating the infant, the base-support may be mounted
15 to have an inclined attitude, and in these circumstances the means for blowing the filtered ambient-air into the compartment may be mounted at the upper, head end of the base-support to blow the filtered air to flow downwardly of the base-support within the compartment. In the
20 latter circumstances, the canopy may extend over the base-support to hang down away from, and beneath, the other, lower end of the base-support as an apron for the infant's legs leaving the compartment open at that end.

- 25 The means for blowing filtered air into the compartment may comprise a filter and a battery-powered electric fan for drawing ambient-air through the filter. The filter

stagnation within the pram, and the consequent danger that the filtered air will not reach the infant; this problem is increased by the high location of the hose-connection in the hood.

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It is an object of the present invention to provide equipment for affording an infant protection against ambient-air pollution, that reduces to a significant extent the likelihood of air stagnation.

10

According to the present invention there is provided equipment for affording an infant protection against ambient-air pollution, wherein a compartment for enclosing the infant involves an elongate base-support which is of a configuration to support the infant in an appropriate sitting or other posture within the compartment, and a canopy that is transparent throughout at least a substantial part thereof, for extension over the infant on the base-support to close-up the compartment except for openings at which the compartment is vented freely to the ambient atmosphere, and wherein the equipment also includes motorised means carried with the base-support for blowing filtered ambient-air into the compartment at a location spaced from the openings to create positive pressure in the compartment relative to the ambient air-pressure, the motorised means being located at one end of the base-support for blowing the filtered air into the compartment to flow towards the other end lengthwise of the infant on the base-support, and at least one of the openings being located towards or at said other end of the base-support.

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The canopy may extend fully over the base-support, and may comprise flexible transparent sheeting supported on arched stays that are pivotable for selective extension of the canopy over the base-support. An element of mesh

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REPLACEMENT SHEET

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**Claims:**

1. Equipment for affording an infant protection against ambient-air pollution, wherein a compartment for enclosing the infant involves an elongate base-support which is of a configuration to support the infant in an appropriate sitting or other posture within the compartment, and a canopy that is transparent throughout at least a substantial part thereof, for extension over the infant on the base-support to close-up the compartment except for openings at which the compartment is vented freely to the ambient atmosphere, and wherein the equipment also includes motorised means carried with the base-support for blowing filtered ambient-air into the compartment at a location spaced from the openings to create positive pressure in the compartment relative to the ambient air-pressure, the motorised means being located at one end of the base-support for blowing the filtered air into the compartment to flow towards the other end lengthwise of the infant on the base-support, and at least one of the openings being located towards or at said other end of the base-support.
2. Equipment according to Claim 1 wherein the canopy comprises flexible transparent sheeting supported on arched stays that are pivotable for selective extension of the canopy over the base-support.
3. Equipment according to Claim 1 or Claim 2 wherein the canopy extends to cover the base-support fully.
4. Equipment according to any one of Claims 1 to 3 wherein the base-support is of an elongate dished configuration and is suspended within an open frame element that carries the canopy.

REPLACEMENT SHEET

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B62B 9/14, F24F 3/16	A1	(11) International Publication Number: WO 96/40546 (43) International Publication Date: 19 December 1996 (19.12.96)
(21) International Application Number: PCT/GB96/01348 (22) International Filing Date: 7 June 1996 (07.06.96) (30) Priority Data: 9511505.1 7 June 1995 (07.06.95) GB (71)(72) Applicant and Inventor: KUESTER, Stephen, Michael [GB/GB]; 20 Farraxton Square, Camp Hill, Northampton NN4 9RQ (GB). (74) Agent: COLES, Graham, Frederick; Graham Coles & Co., 24 Seeleys Road, Beaconsfield, Buckinghamshire HP9 1SZ (GB).	(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.	

(54) Title: PERSONAL PROTECTION

(57) Abstract

A transparent canopy (7) covers an infant seated within a baby-buggy for protecting him/her from exposure to ambient-air pollution, and a powered filter-unit (9) blows filtered ambient-air into the top of the compartment (8) between the canopy (7) and the seat-unit (4). The bottom of the compartment (8) is open where a lower, apron portion (16) of the canopy (7) hangs spaced from the seated-infant's legs. Entry of polluted air via the opening is blocked by operating the powered filter-unit (9) to create positive pressure within the compartment (8) so that the filtered air flows downwardly of the infant's face and body; a mesh inset (20) in the canopy (7) gives balanced ventilation and avoids heat build-up. The seat-unit (4) involves a back panel (25) suspended by fabric sections (26-28) within a frame (5). The panel (25) can be unlatched (29) to adapt the seat-unit (4) for use as a carry-cot.

