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(54) Ventilation device with removable valve

(57) A ventilation device for a frame of a window or door and the like comprises a housing (1) with an outside (2) and an inside (4), between which a ventilation passage (6) extends, which housing (1) comprises at least a base section (7,32-35) which can be fixed in the frame and has passage openings (12) which form part of the ventilation passage (6), and also comprises a valve element (14,31) for closing or opening the ventilation passage (6). The valve element (14,31) is accomodated on a counter-section (13,24,30) which defines a valve seat for the valve element (14,31) and is detachably fixed on the base section (7,32-35).

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Description

[0001] The invention relates to a ventilation device for a frame of a window or door and the like, comprising a housing with an outside and an inside, between which a ventilation passage extends, which housing comprises at least a base section which can be fixed in the frame and has passage openings which form part of the ventilation passage, and also comprising a valve element for closing or opening the ventilation passage, The term outside should be understood as the side facing the external environment, while inside should be understood as the side facing the room to be ventilated.

[0002] Such a ventilation device is known. The valve element is usually rotatably fixed to the base section in such a way that the open or closed position can be obtained by means of a lever or by direct manual operation of the valve element.

[0003] The known ventilation devices provide a suitable ventilation capacity for the rooms behind them. However, as time passes a certain soiling occurs, depending on the degree of pollution of the outside air. The disadvantage of the known devices is that the inside of these devices is difficult to reach, with the result that they cannot be cleaned properly.

[0004] The object of the invention is to provide a ventilation device of the type mentioned above, the inside of which is actually easily accessible, for example for cleaning work. That object is achieved by the fact that the valve element is accommodated on a counter-section which defines a valve seat for the valve element and is detachably fixed to the base section.

[0005] The counter-section and valve element, which together form the inner boundary of the housing, can be mounted as a unit on, and removed as such from, the housing. This means that the inside of the ventilation device remains easily accessible, so that the ventilation passage and also the internal surface of the valve element remain easily accessible.

[0006] Dirt, insects and the like could enter the ventilated room through the ventilation passage. In order to prevent that, a grille can extend over the ventilation passage, said grille being situated on the side of said valve element which faces the outside.

[0007] The grille can form part of the counter-section. The grille with counter-section and the valve element in that case form a unit which is removable in its entirety. The advantage of such a design is that the grille is easy to clean and any faults in the operating mechanism can be repaired easily. Moreover, after removal of the unit, the grille does not constitute any obstacle to cleaning of the ventilation passage.

[0008] The valve element can be designed in various ways. The valve element is preferably a valve section which near one of its longitudinal edges is rotatably suspended from the counter-section. It may be suspended either from the top longitudinal edge or from the bottom longitudinal edge. Said valve section can have, for example, a longitudinal ridge on its surface facing the inside of the ventilation device, by means of which ridge it can be set in the open or closed position by direct manual operation.

[0009] The fact that the grille is placed on the side of the valve element facing the outside also has the advantage that the grille cannot be seen from the room to be ventilated. This means that, viewed from the ventilated room, the ventilation device has a streamlined appearance, which in many cases is more acceptable than a grille shape.

[0010] An additional advantage is that, since the grille cannot be seen, it is no longer possible to seal off the grille partially or completely. In practice, it appears that a visible grille can evoke associations with draughts and the like. It is true that these associations are misconceptions, since the closed valve element can prevent draughts, but the grille is still sometimes covered up, for example with adhesive tape.

[0011] In the case of the embodiment concerned this problem does not occur. Moreover, draughts can be avoided when the valve element is open by making the valve section hinge on its bottom edge in such a way that a flow directed towards the ceiling is produced.

[0012] According to a further possibility, the valve section has insulating material on its side facing the outside. This means that the heat and sound insulation of the ventilation device can be improved.

[0013] The sound insulation can be improved even further if the counter-section is in the form of a box in which a ventilation passage bounded at the top and bottom side by sound-deadening material extends, which box at its end facing the outside is detachably fixed to the base section.

[0014] The ventilation device according to the invention is of a modular type. Various types of counter-sections can be fixed to the standard base section, preferably by snapping into place. As already mentioned, said counter-section can simply fulfil the function of bearer of the valve element. As an alternative, the counter-section can bear a grille, and as a further alternative, it can bear a complete "silencer box". Such a modular type of construction makes the ventilation device according to the invention more flexible to use. Moreover, the storage costs and manufacturing costs are relatively low, in view of the standardization of in particular the base section and the valve section. In addition, the abovementioned advantage of the ventilation passage being easily accessible is obtained.

[0015] According to yet another variant, the housing itself can be in the form of a box in which a ventilation passage bounded at the top side and the bottom side by sound-deadening material extends. The counter-section is detachably fixed to the end of the box facing the inside.

[0016] In this last case the counter-section and the valve section together form standard modular parts which can be used in different types of housing (for ex-

ample, a housing in the form of a base section or of a silencer box).

[0017] Furthermore, the at least one base section can bear an end piece on at least one of its longitudinal ends, and at its corresponding longitudinal end the valve element can interact with the end piece in order to provide predetermined positions of the valve element. The end piece preferably has a curved groove, while the valve element has a correspondingly curved elastic arm piece which is movable in the groove, which arm piece and groove are provided with raised parts and/or projections which determine stop positions of the valve element.

[0018] The end pieces and arm pieces, which are preferably situated at both ends of the base section and the valve section respectively, can be made of plastic and can be fitted afterwards. Various designs can also be fitted as desired, in order to provide various stop positions of the valve element.

[0019] The invention will be explained in further detail below with reference to the embodiments shown in the figures.

[0020] Figure 1 shows a cross section of a first embodiment of the ventilation device according to the invention.

[0021] Figure 2 shows a second embodiment.

[0022] Figure 3 shows a third embodiment.

[0023] Figures 4a to 5b inclusive show a ventilation device with various end positions of the valve element.

[0024] The first variant of the ventilation device according to the invention shown in Figure 1, comprises a housing indicated in its entirety by 1, on the outside 2 of which a cap section 3 with protective cap is situated. Situated on the inside 4 of the housing 1 is a valve unit indicated in its entirety by 5. An air passage 6 extends between the outside 2 and the inside 4 of the housing 1.

[0025] In the example shown in Figure 1 the housing 1 comprises, inter alia, the base section 7, the underside of which has a glass section 8. Together with the cap section 3, the top side of the base section 7 forms a ridge 9 (top rebate of frame). By means of this glass section 8 and ridge 9, the housing 1 can be accommodated in a window or door frame and the like.

[0026] The ridge 9 is formed by a ridge part 10 which forms part of the cap section 3, and by a ridge part 11 which forms part of the base section 7. The ridge part 11 and the glass section 8 of the base section 7 are connected to each other by means of cross-pieces 12, which are situated at regular intervals and form part of the ventilation passage 6.

[0027] According to the invention, the valve unit 5 consists of a counter-section 13, to which the valve section 14 is rotatably fixed. For this purpose, the counter-section 13 has at its bottom end a ridge 15, around which the valve section 14 with longitudinal recess 16 is snapped.

[0028] The counter-section 13 has on its underside an edge which is accommodated in the groove 17 of the base section 4. The base section 4 has on its top side a ridge 18, which is snapped into the longitudinal recess 19 of the counter-section 13.

[0029] Thanks to this connection, the valve unit 5 is easy to fit on the base section 4, and to remove from it again, for example for cleaning the passage 6.

[0030] The counter-section 13 has a grille 20, which relative to the valve section 14 is situated on the side facing the outside 2. The grille 20 therefore also forms part of the valve unit 5. When said valve unit 5 is removed, said grille is also easy to clean.

[0031] As shown in Figure 1, the valve section 14 is curved in a convex shape on the side facing the inside 4 of the base section. The valve section 14 also covers the grille 20, so that the latter cannot be seen, which produces a streamlined external appearance.

[0032] Another advantage is that the grille 20 cannot be taped off in an undesirable way, which would reduce the necessary ventilation capacity.

[0033] The valve section 14 also has a moulded-on edge 21, for retaining the layer of insulating material 22. Said layer produces improved sound and heat insulation of the valve section 14. The layer of insulating material 22 can easily be removed for cleaning or replacement.

[0034] A layer of sound-deadening material 23 is also provided in the cap section 3. These layers of insulating material 22, 23 are not essential. If the insulation requirements are not so high, these layers may be omitted.

[0035] In the case of the variant of the ventilation device shown in Figure 2 the same base section 5 as that in the embodiment of Figure 1 is used.

[0036] However, the counter-section 24 in this case is designed in such a way that it also comprises a box 25 in addition to the grille 20. Said box 25 is fixed to the base section 7 by means of the snap-in connections with ridges 18, 26 and recesses 19, 27.

[0037] Layers of sound-deadening material 28, 29 are accommodated in the box 25, in such a way that the sound which would penetrate from the outside 3 is deadened.

[0038] The valve section 14 is identical to the valve section used in the variant of Figure 1, and is rotatably fixed to the counter-section 24 by means of the ridge/groove connection 15, 16.

[0039] The embodiment of Figure 3 relates to a ventilation device which is likewise provided with a silencer box 25 with layers of sound-deadening material 28, 29 which bound the ventilation passage 6. This ventilation device, which is known per se, is likewise provided with the valve unit 5 according to the invention. Said valve unit 5 has a counter-section 30, which is fixed to the silencer box 25 by means of snap-in connections 18, 19, 26, 27.

[0040] In the case of the embodiments of Figures 1 and 2 the end positions of the valve section 14 can be determined by means of the end pieces 31, which are provided on each longitudinal end of the valve unit 5; see Figures 4a-5b. Said end pieces 31 interact with the

arm pieces 32, which are situated on both ends of the valve section 14. The arm pieces 32 have arms 33, provided with projections 34, which can be snapped into the recesses 35 of the grooves 36 in the end pieces 31. Said arm pieces also have a control handle 37.

[0041] In the case of the variant shown in Figures 4a and 4b this makes a minimum open position (Figure 4a) and a maximum open position (Figure 4b) possible.

[0042] In the case of the variant of Figure 5 a closed position (Figure 5a) and a maximum open position (Figure 5b) of the valve section 14 are possible.

[0043] The desired output of the device can be changed by replacing the end pieces 31 with different end pieces with stops in different positions. The other parts remain the same, which reduces the storage costs and makes adaptation to the requirements of the user possible.

Claims

1. Ventilation device for a frame of a window or door and the like, comprising a housing (1) with an outside (2) and an inside (4), between which a ventilation passage (6) extends, which housing (1) comprises at least a base section (7, 32-35) which can be fixed in the frame and has passage openings (12) which form part of the ventilation passage (6), and also comprises a valve element (14, 31) for closing or opening the ventilation passage (6), characterizes in that the valve element (14, 31) is accommodated on a counter-section (13, 24, 30) which defines a valve seat for the valve element (14, 31) and is detachably fixed to the base section (7, 32-35).

2. Device according to Claim 1, in which a grille (20) extends over the ventilation passage (6), said grille being situated on the side of the valve element (14) which faces the outside (2).

3. Device according to Claim 2, in which the grille (20) forms part of the counter-section (13, 24, 30).

4. Device according to one of the preceding claims, in which the valve element comprises a valve section (14) which near one of its longitudinal edges is rotatably suspended from the counter-section (13, 24, 30).

5. Device according to Claims 2, 3 and 4, in which in the open state the valve section (14) extends further towards the inside (4) than is the case in the closed state.

6. Device according to Claim 4 or 5, in which the valve section (14) has insulating material on its side facing the outside (2).

7. Device according to Claim 6, in which the valve section (14) has at least one ridge (21) for fastening the insulating material (22).

8. Device according to Claim 4, 5, 6 or 7, in which the valve section (14) is curved in cross section, and the convex side of the valve section (14) faces away from the outside (2).

9. Device according to one of the preceding claims, in which the counter-section (24) is in the form of a box in which a ventilation passage (6) bounded at the top and bottom side by sound-deadening material (28, 29) extends, which box at its end facing the outside (2) is detachably fixed to the base section (7).

10. Device according to one of Claims 1-8, in which the housing is in the form of a box (25) in which a ventilation passage (6) bounded at the top side and bottom side by sound-deadening material (28, 29) extends, and the counter-section (30) is detachably fixed to the end of the box (25) facing the inside (4).

11. Device according to one of Claims 1-9, in which the at least one base section (7) bears an end piece (31) on at least one of its longitudinal ends, and at its corresponding longitudinal end the valve element (14) interacts with the end piece (31) in order to provide predetermined positions of the valve element (14).

12. Device according to Claim 11, in which the end piece (31) has a curved groove (36), and the valve element (14) has a correspondingly curved elastic arm piece (32) which is movable in the groove (36), which arm piece (32) and groove (36) are provided with projections (34) and recesses (35) which determine stop positions of the valve element (14).

Fig 1

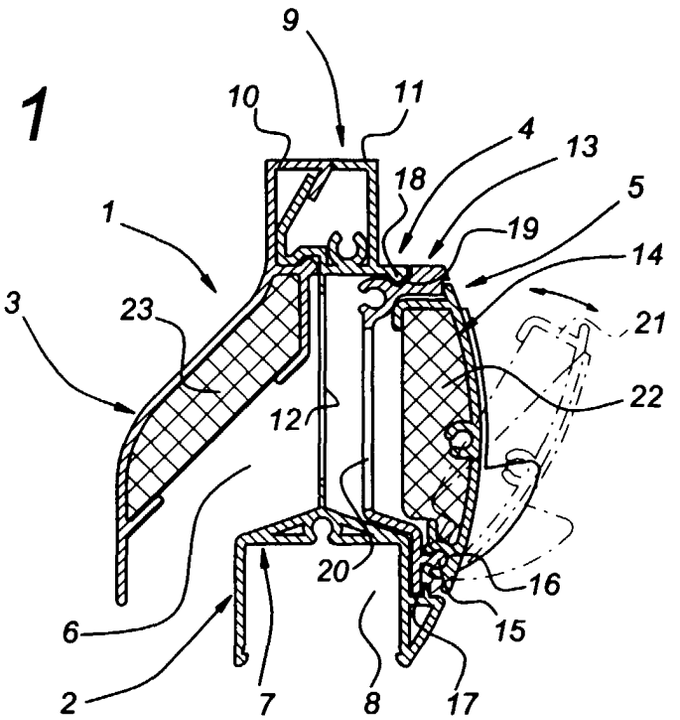
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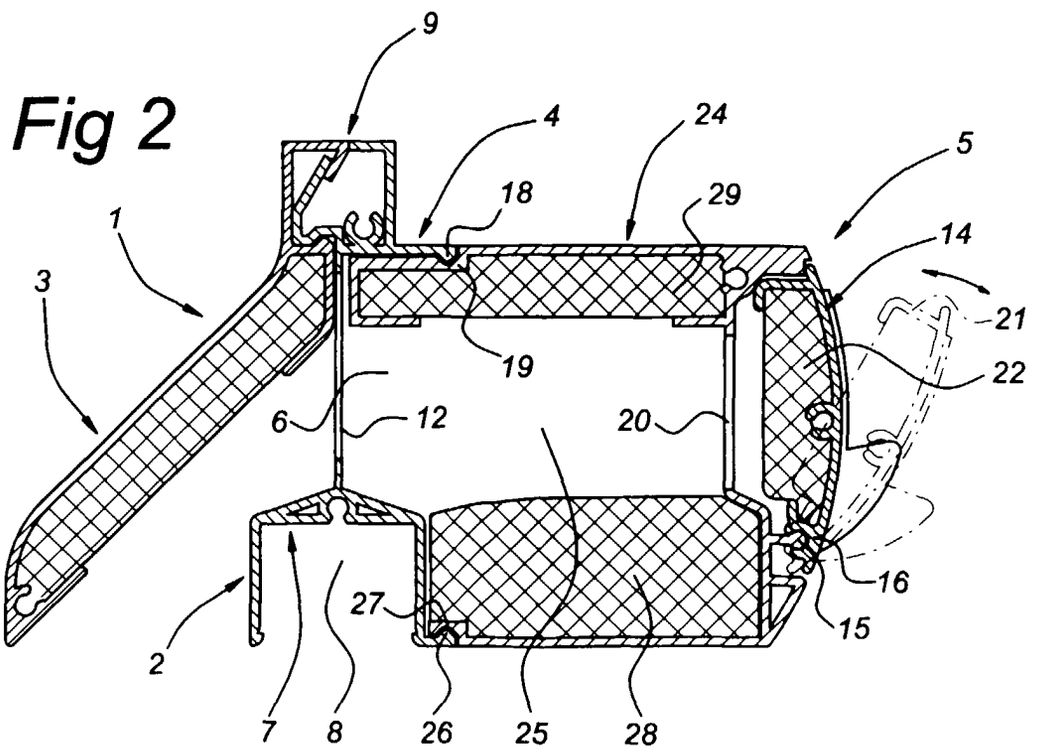
Fig 2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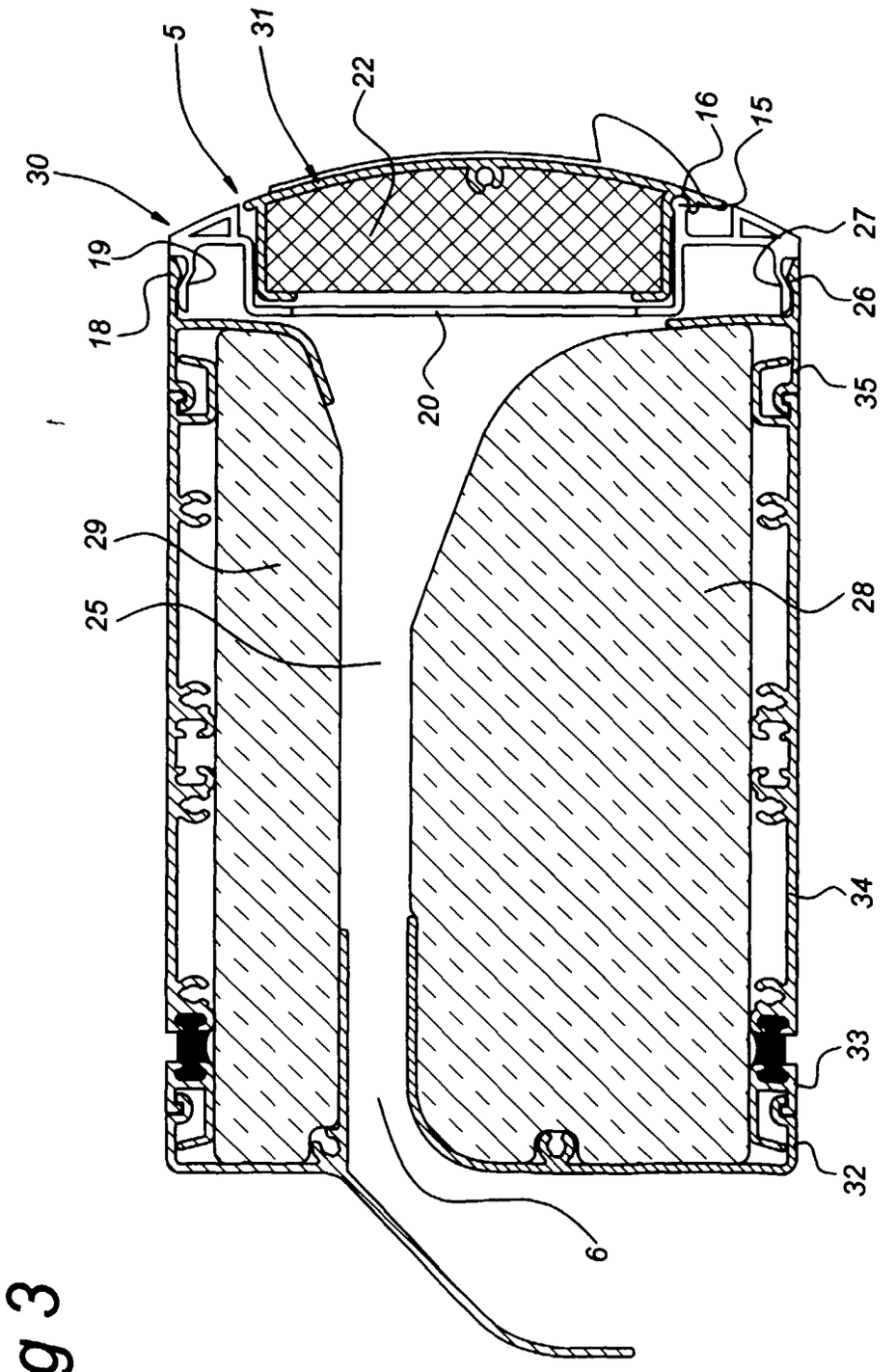


Fig 3

Fig 4a

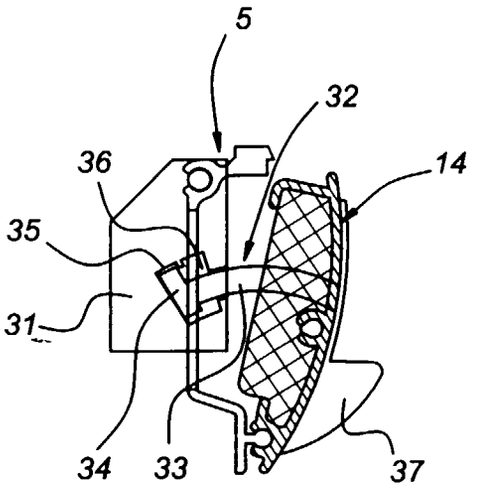


Fig 4b

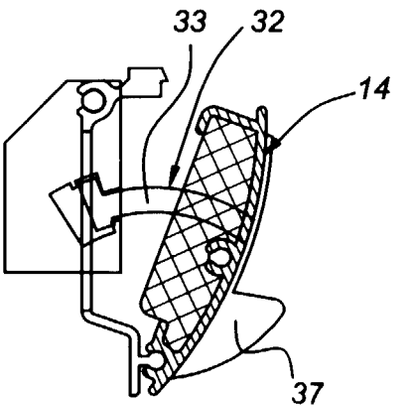


Fig 5a

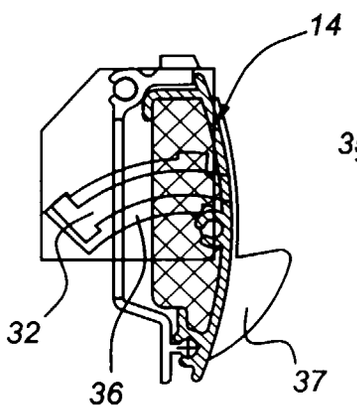
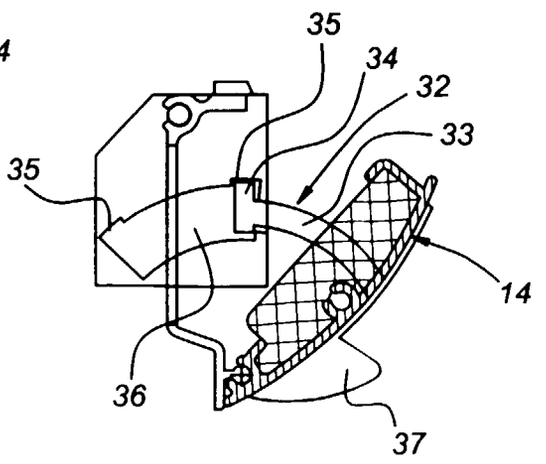


Fig 5b



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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 3521

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 March 2000	Andlauer, D

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 3521

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

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THE HAGUE	29 March 2000	Andlauer, D

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