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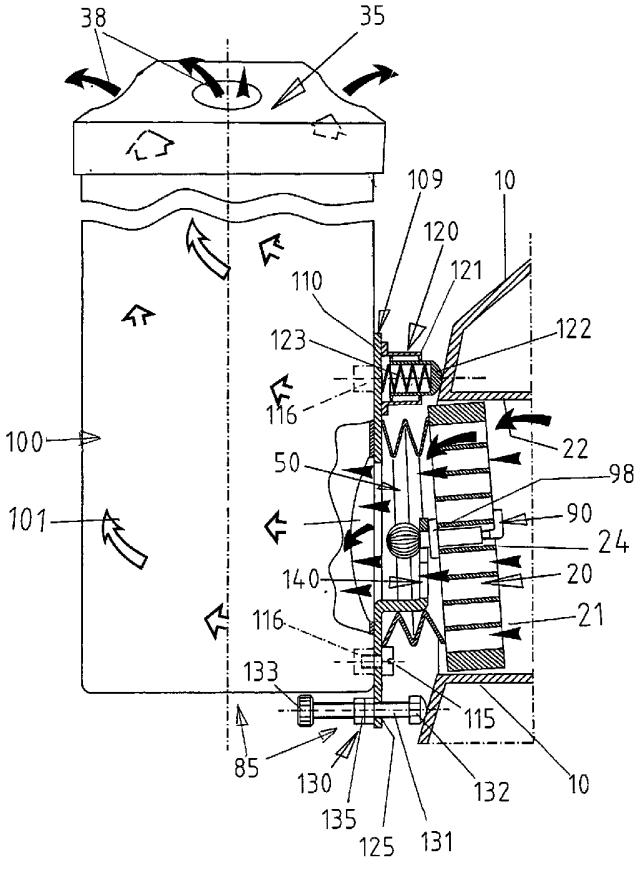
(54) **Title:** APPARATUS WITH A COOLING OR HEATING CONTAINER TO FIT ONTO THE AIR CONDITIONING GRILLES IN MOTOR VEHICLES



(57) **Abstract:** Apparatus (85) for cooling or heating aids to comfort and articles of general utility during a journey by motor vehicle, comprising a container (100) of said articles with a connecting device (90-109) to determine, by means of its movable connection to one of the ordinary grilles (20), with parallel fins (21, 24) present for air conditioning in the vehicle, passage of at least a part of the air flowing from said grille (20) to the inside of said container (100) through a large hole (102) maid in its wall (101).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Apparatus with a cooling or heating container to fit onto the air conditionig grilles in motor vehicles

The invention concerns systems for cooling or heating, especially those aids to comfort such as drinks, inside motor vehicles.

It is well known that motor vehicles can be air conditioned intenally by introduction of cooled or heated air through certain adjustable ducts and grilles, these means being generally situated on the dashboard.

The grille device generally consists of a sort of cup provided with horizontal fins and a means for adjusting by hand the quantity and direction of the air.

These adjusting means generally allow the air to be directed through the grilles as desired and also total or partial closing of the duct through which conditioned air passes to reach them.

In the most modern motor vehicles, the number, position and regulating systems of the grilles make it possible to supply very cold air and thus quickly lower temperature inside the vehicle.

Bearing in mind that road travel often lasts seveal hours and that shops may be few and far between, together with the need to have available hot or cold drinks and other aids to comfort, it is clear that though travellers take food and drink with them, these cannot be kept at the right temperature for maximum enjoyment.

In luxury vehicles conditioning equipment is sometimes provided to contain drinks and food but, for reasons of cost and space, this is not possible in small and medium-sized cars.

Purpose of the present invention is to overcome these problems by simple and inexpensive means, suitable for practically all cars on the roads.

Subject of the invention is an apparatus for cooling or heating those aids to comfort so essential for the longer journeys by car.

The apparatus comprises a container with a moveable device connecting up to one of the ordinary air outlet grilles, with parallel fins, used for conditioning the inside of the motor vehicle, in such a way that part of the air passes through the grille and into said container through a large hole in its wall at the level of the grille.

Around this large hole is a expandible tubular section of elastic material long enough to permit fluidic connection between the container and the grille and for flexible adaption to variations in their relative distances and reciprocal orientations.

In some types of execution the container has continuous walls and a cover with holes in it through which air from the grille passes.

The parts connecting the container to the grille comprise a traction rod at whose end is a head bent at 90°.

After introducing its head between two fins on the grille, so passing through them, the rod is rotated from outside until its head lies orthogonally to the fins, after which an outward pull is applied to it by its threaded end being screwd onto an internal threaded part that connects with the means fixed to the container.

The end of the traction rod forming a head turned at 90° may be in the form of an "L" or a "T".

In one type of execution the connecting device comprises a pair of said traction rods placed at lateral tongues created by recesses on the wall of the container while, internally, the threaded part consists of a nutscrew and the like which, according to how much space there is beween the container and the grille, can be screwed up with the fingers or with a wrench.

The traction rods are rotated by using the fingers to turn an orthogonal arm of said rods situated in the space between the container and the grille.

In one type of execution the connecting device comprises a clamp system applicable to the grille and a structure fixing it to the container.

The clamp comprises a traction rod and an internally threaded part consisting of a cylindrical block, of a diameter less than the space between two consecutive fins on the grille, with a head.

The head is formed of a disk, to make contact with the fins, and of a round knob held to the disk by an axial pin.

The knob, preferably spherical, is covered with meridian-wise ribs.

The above fixing structure consists of a small rectangular plate mounted with screws, or equivalent means, onto that area of the container's wall to be opposed to the grille.

At the position of the large hole in the wall of the container, the rectangular plate presents a hole the diameter of which is not less than that of the first hole, from whose edge projects a tongue, substantially parallel to the plate, in which there is a hole shaped like the knob on the clamp not smaller in size and joined to an upper rectangular hole of a width corresponding to that of the pin in said clamp and having an upper semicircular end.

It is thus possible to form a stable connection between the grille and the clamp and therefore connect this latter to the container at the

time of use, or when desired, by passing the knob through the hole in the tongue of the fixing structure and move the container down till the end of said rectangular hole makes contact with the pin in said clamp.

Orientation of the container inside the vehicle can be definitively established, irrespective of inclinatiion of the grille, by regulators placed respectively at the upper and lower ends of the plate and pressing against the area round the dashboard into which the grille is fitted.

The upper regulator comprises a button free to move axially, pressed by an internal spring, in relation to a base fixed to the plate. Below there is a pair of regulators each consisting of a screw that screws into an orthogonal hole, one at one side and the other at the other side of the lower end of the plate, each screw having a convex foot, a head that can be turned with the fingers, and two locking nuts.

The shape of the container may be substantially cylindrical or square, and of different sizes, according to the type of execution and to the use that will be made of it.

In one type of execution the container comprises a removeable basket so that the objects to be cooled or heated can be suitably arranged inside it. The size and shape of this basket will differ according to the objects it is required to contain.

The invention offers evident advantages.

The apparatus described make it possible to cool or heat aids to comfort such as drinks, food, confectionary, medicines etc by simple and inexpensive means of minimum bulk, that can be installed as needed in practically any motor vehicle.

Especially on journeys that take longer than initially planned, the possibility of having available hot or cold food and drink is not only of very great benefit but, in some climatic conditions, may even be of vital importance.

One need only think of the relief given by a drink of cool water after a long hot drive, or of how deterioration of fruit, chocolates or medicines for example, can in this way be prevented.

Considering the low cost of the apparatus and the fact that provision of ventilation or warmth is actually free of charge, the equipment described can undoubtedly enjoy a very wide application.

Characteristics and purposes of the invention will be made still clearer by the following examples of its execution illustrated by diagrammatically drawn figures.

Fig. 1 Detail of a typical dashboard in the average car, front view.

Fig. 2 Detail of an ordinary grille for conditioned air, front view.

Fig. 3 First example of execution of the invented apparatus with a heat conditioning container that can be fitted to the grille, cross section.

Fig. 4 As above, seen from the rear.

Fig. 5 The apparatus fitted to the grilled mounted on a dashboard, longitudinal section.

Fig. 6 Second example of execution of the invented apparatus showing a dashboard with a grille and the clamp of a device for connecting the container to the grille, cross section.

Fig. 7 As above, seen from the front.

Fig. 8 Side view of the connecting clamp, partially cut away.

Fig. 9 Structure of the connecting device applied to the container, front view.

Fig. 10 As above, longitudinal section.

Fig. 11 As above, cross section.

Fig. 12 The apparatus fitted onto the grille, longitudinal section.

Figures 1 and 2 show the dashboard 10 of an ordinary motor vehicle, the steering wheel 11, the grille 20 at one side and the horizontal fins 21.

The grille can be turned around a horizontal axis inside a box 22, while internal vertical fins, not shown, can be rotated around vertical axes using the finger grip 23.

The apparatus subject of the invention consists, in one type of execution 25, of a container 30 and connecting device 60.

The substantially cylindrical container 30 presents sides 31 joined to a flat rear wall 32 in which are a pair of recesses 33 that connect with said wall through the inclined areas 34.

In said rear wall 32 is a large central hole 40 glued to which is a tubular expandable part 50 of elastic material made with ringwise pleats 51.

Situated at the position of the recesses 33 on the rear wall 32 is the connecting device 60 formed of a pair of rods 61 with a T-shaped head 62 and threaded ends 65 onto which a nutscrew 66 is screwed.

At a short distance from the threaded end 65, an arm 70 is fixed to the rod 61, said arm being inclined at substantially 45° in relation to said T-shaped head 62.

As shown in Figures 4 and 5, on the upper end of the cylindrical container 30 is a cover 35 with internal threading 36 to screw onto the external thread 37 on the edge of the container 30.

This cover 35 has large holes 38 in it.

As shown in Figures 3 and 5, a bottle of water 80, or anything else that needs to be cooled or heated, can be placed inside the container 30.

Figure 5 shows the container 30 fixed to the fins 24 of the grille 20 by the pair of rods 61.

To do this, it is only necessary to rotate said rods 61 using their arms 70 to turn the T-shaped heads 62 in a position 62' parallel to the pair of fins 24 (seen on the left in Figures 3 and 4).

After introducing said heads 62 between said pair of fins 24, they are then turned by means of their arms 70 to position 62" where they will lie orthogonally to said fins 24 (on the right in Figures 3, 4, and 5).

To lock the container 30 to said grille 20 (Figure 5), the nutscrews 66 are simply tightened from the side, using the figures or a wrench 67 (Figure 4), so causing the tubular pleated part 50 to contract.

Figures 6-12 illustrate another type of execution 85 of the apparatus subject of the invention, consisting of a container 100 and a connecting device 90-109.

Figure 6 shows a cross section of the grille 20 on the dashboard 10, and the clamp 90 seen enlarged in Figure 8.

Said clamp 90 comprises an internally threaded cylindrical block 93 having a head comprising a ball-shaped part 91 with meridian-wise ribs 92 (see Figure 6), and a disk 94 joined to the ball by a pin 98.

A threaded rod 95, with an orthogonally bent head 97 forming an "L", is screwed onto said cylindrical block.

From the side of the rod 95, the clamp 90 is introduced to fit it in between the central pair of fins 24.

Having turned the ball 91 round its axis to bring the head 97 of the threaded rod 95 orthogonal to at least one of the fins 24, turning must then be continued, keeping the head 97 close against the rear end of the fin, until said ball is locked between the disk 94 and said head 97.

Screws 115, screwing into the threaded bosses 116 on the wall 101 of the container 100 (Figures 9,12), serve to mount the structure 109 of the connecting device 90-109.

Said structure 109 comprises a rectangular plate 110 in which is a large hole 111 aligned with a large circular hole 102 in the container 100 completed by the raised rim 103 extending as far as a geometrical plane tangential to the above cylindrical body at the position of the plate 110.

At the top of the plate 110, there is a regulator 120, placed orthogonally at the vertical axis of symmetry, and comprising a hollow cylindrical base 121 that supports a button 122 pressed outwards by an inner spring 123.

A pair of threaded holes 125, made in the lower part of the plate 110, receive the screws 130 with heads 131, rounded bases 132 and a pair of lock nuts 135.

Low down in the hole 111 in the plate 110, the tongue 140 rises parallel, there being in said tongue a vertical axial rectangular hole with a semicircular top 142, of a width slightly greater than that of the pin 98 in the clamp 90, and below this a larger circular hole 144 the diameter of which is slightly greater than that of the ball 91.

The centre of the semicircular top 142 of the rectangular hole 141 corresponds with the centre of the large coaxial holes 102 in the container 100, and 111 in the plate 110.

The tubular pleated part 50 is fitted on around said hole 111 in the plate 110.

It is thus possible to fit the container 100 to the grille 20 on the dashboard 10 of a motor vehicle, even if inclined as seen in Figure 12, by causing the ball 91 on the clamp 90 to pass through the hole 144 in the tongue 140, then lowering the container 100 until the semicircular top 142 of the rectangular hole 141 coincides with the pin 98 joining said ball 91 to the disk 94.

By using the adjusting screws 130 at the lower end of the plate 110 against the dashboard 10 (Figure 12), the container 100 can be given the desired position, even vertical, irrespective of the inclination of the grille 20.

As will be seen in Figures 5 and 12, some of the cold or warm air that emerges from the grille 20 between the fins 21, can be directed through the tubular pleated part 50, the hole 40 in the rear wall 32 of the container 30, or through the hole 111 in the plate 110 and the hole 102 in the wall of the container 100, so as to enter the containers themselves, passing out at the top through the holes 38 in the cover 35.

The bottle 80 of water, packaged drinks, medicines or other goods, even small ones such as chocolates or packets put in a basket and

passed into the containers 30 and 100 through the upper aperture, are rapidly cooled or heated to the required temperatures as the air emerging through the conditioner grilles in the vehicle can be easily regulated.

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CLAIMS

1. Apparatus (25) (85) for cooling or heating aids to comfort or articles of general utility during a journey by motor vehicle (9), characterized in that it comprises a container (30) (100) with a connecting device (60), (90-109) to determine, through its movable connection to one of the usual grilles (20), with parallel fins (21) (24), present in a motor vehicle (9) for conditioning temperature, passage of at least part of the flow of air from said grille (20) to the inside of said container (30) (100) through a large hole (40) (102) in its wall (32) (101) at the position of the grille.

2. Apparatus (25) (85) as in claim 1, characterized in that fitted around the large hole (40) (102) in the wall (32) of the container (30) (100) at the position of the grille (20) is a tubular pleated part (50) of elastic material long enough to allow fluidic connection between the container (30) (100) and the grille (20) thereby flexibly compensating variations in the distance between container and grille and in their reciprocal orientations.

3. Apparatus (25) (85) as in claim 1, characterized in that the container (30) (100) presents continuous walls and a cover (35) with holes (38) to allow air received from the grille (20) to escape.

4. Apparatus (25) (85) as in claim 1, characterized in that the device (60) (90-109) connecting the container (30) (100) to the grille (20) comprises a traction rod (61) (95) on which is a head (62) (97) at 90°, said rod (61) (95), after introduction of the head (62) (97) between two fins (24) on the grille (20) till it passes beyond them, being then rotated from outside the grille (20) until said head (62) (97) lies orthogonally to the fins (24), the rod then being drawn outwards there being screwed onto its threaded end (65) (96) an internally threaded part (66) (93) that connects with means (32) (140) fixed to the container (30) (100).

5. Apparatus (25) (85) as in claim 4,
characterized in that the shape of the head (62) (97) at 90° on the traction rod (61) (95) is that of an "L".

6. Apparatus (25) (85) as in claim 4,
characterized in that the shape of the head (62) (97) at 90° on the traction rod (61) (95) is that of a "T".

7. Apparatus (25) as in claim 4,
characterized in that the connecting device (60) comprises a pair of traction rods (61) situated at lateral tongues created by recesses (33) on the wall (32) of the container (30) and an internally threaded part, this being a nutscrew (66) and the like, that can be turned with the fingers or with a wrench (67) according to the space available between the container (30) and the grille (20).

8. Apparatus (25) as in claim 6,
characterized in that rotation of the traction rods (61) is done with the fingers on one orthogonal arm (70) situated in the space between the container (30) and the grille (20).

9. Apparatus (85) as in claim 4,
characterized in that the connecting device (90-109) comprises a clamp (90) to be mounted on the grille (20) and a fixing structure (109) to be mounted on the container (100), said clamp comprising a traction rod (95) and the internally threaded part consisting of a cylindrical block (93), of a diameter less than the space between two consecutive fins (24) on the grille (20), said block having a head formed of a disk (94) that will make contact with the fins (24) and a knob (91) joined to the disk (94) by an axial pin (98).

10. Apparatus (85) as in claim 9,
characterized in that the knob (91) is spherical.

11. Apparatus (85) as in claim 10,
characterized in that the spherical knob (91) presents meridian-wise ribs

12. Apparatus (85) as in claims 1, 4 and 9

characterized in that the fixing structure (109) consists of a rectangular plate (110), mounted by screws (115) or equivalent means onto the area of the wall (101) of the container (100) that will lie opposed to the grille (20), which plate (110) presents, at the position of the large hole (102) on the wall (101) of the container (100), a hole (111) of a diameter not less than that of the first hole, from whose rim extends a tongue (140), substantially parallel to the plate (110) in which there is a hole (144) of the same shape as the knob (91) on the clamp (90) but not smaller in size, that joins onto an upper rectangular hole (141) of a width corresponding to that of the pin (98) on said clamp (90) and having a semicircular end (142), it being thus possible to form a stable connection between the grille (20) and the clamp (90) and therefore mount the container (100) onto this latter when required, this being done by passing the knob (91) through the hole (144) in the tongue (140) on the fixing structure (109) then lowering the container (100) until the end (142) of said rectangular hole (141) makes contact with the pin (98) on said clamp (90).

13. Apparatus (85) as in claims 1 and 12,

characterized in that orientation of the container (100) inside the motor vehicle (9), irrespective of how the grille (20) is inclined, can be firmly established by regulators (120) (130) provided for the purpose placed respectively at the upper and lower ends of the plate (110) and pressing against the area of the dashboard (10) around the box (22) in which the grille (20) is inserted.

14. Apparatus (85) as in claim 13,

characterized in that the upper regulator (120) comprises a button (122) free to move axially in relation to a base (121) fixed to the plate (110) under pressure from an inner spring (123) while the pair of lower regulators (130) each consist of a screw (131) that screws into an orthogonal hole (125) one made on one side and the other on other side of the lower end of the plate (110), each screw (131)

comprising a rounded foot (132), a head (133) that can be turned with the fingers, and two lock screws (135).

15. Apparatus (25) (85) as in claim 1,

characterized in that the container (30) (100) is a substantially cylindrical in shape.

16. Apparatus (25) (85) as in claim 1,

characterized in that the container (30) (100) is square in shape.

17. Apparatus (25) (85) as in claim 1,

characterized in that the container (30) (100) presents different dimensions according to the use to be made of it.

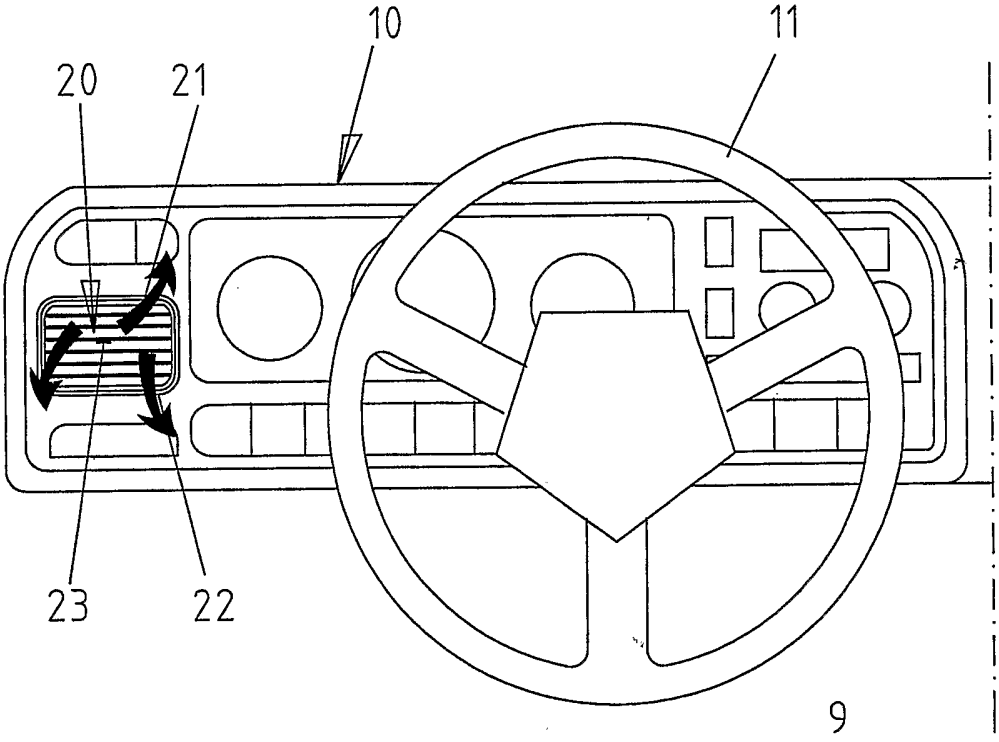
18. Apparatus (25) (85) as in claim 1,

characterized in that the container (30) (100) comprises a basket that can be taken out as required and filled with any small articles that have to be cooled or heated.

19. Apparatus (25) (85) as in claim 18,

characterized that the shape and size of the basket vary according to the articles it is required to contain.

FIG.1



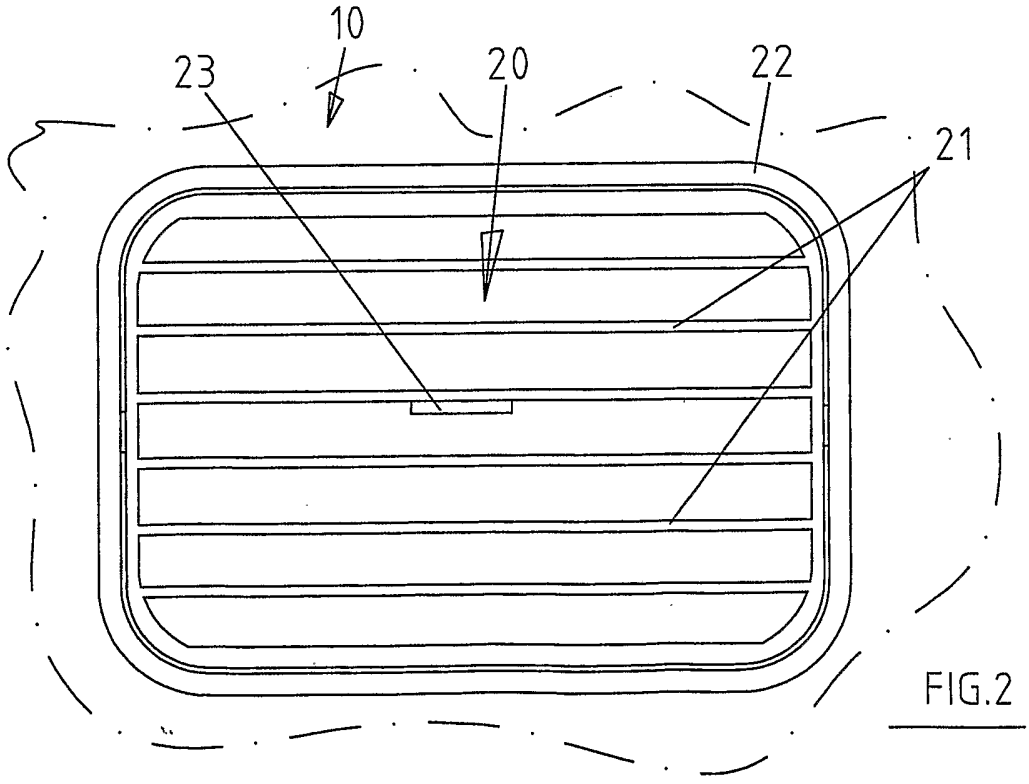
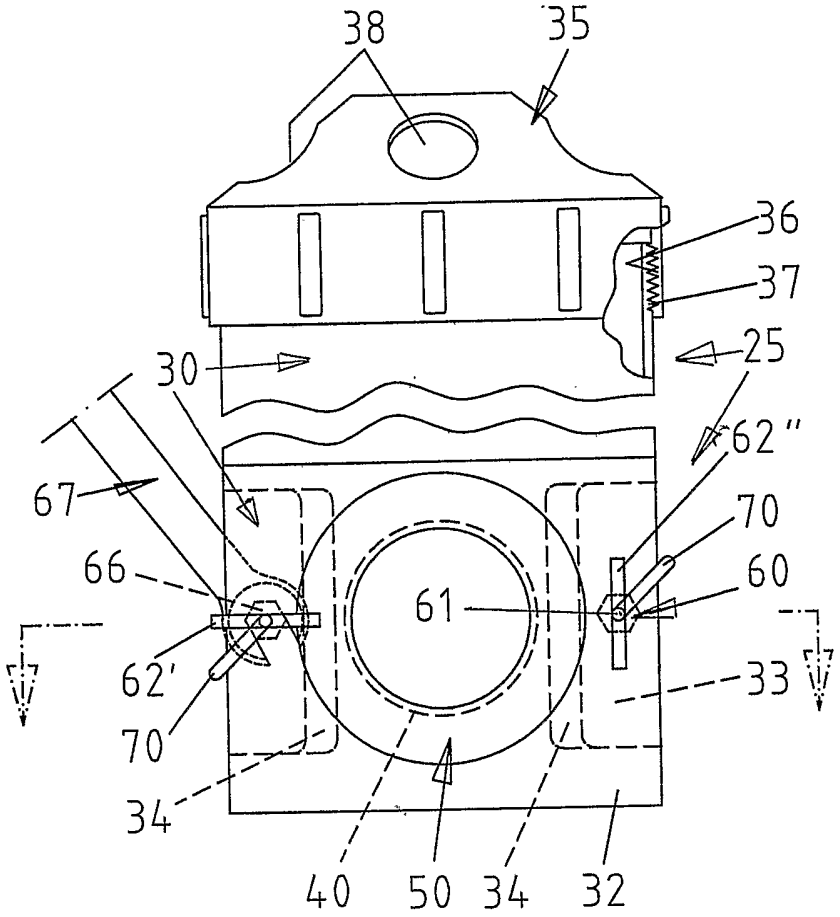


FIG.2

FIG.4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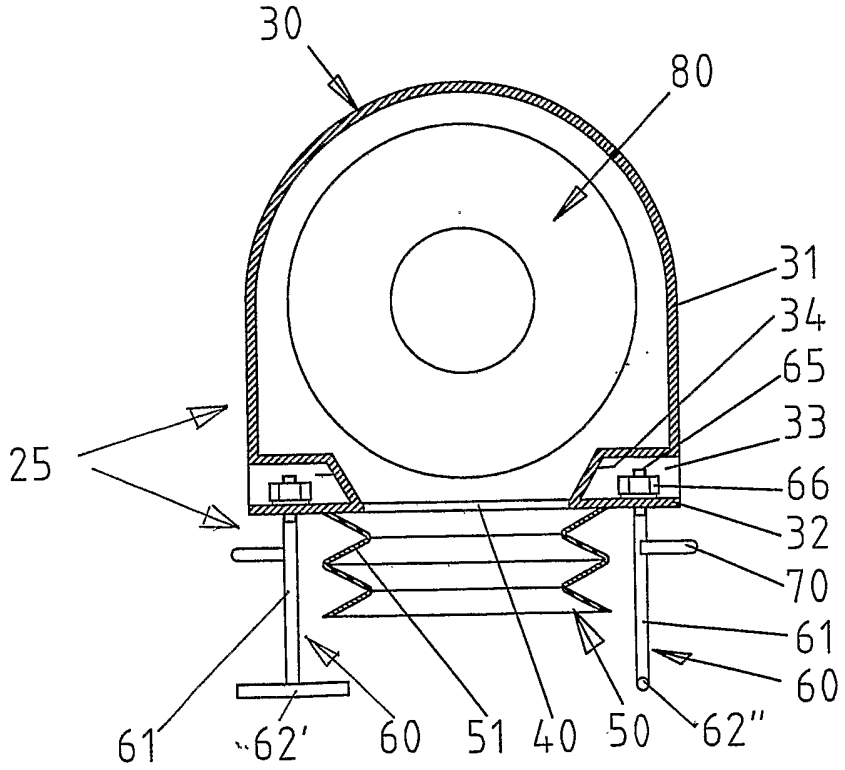
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FIG.3

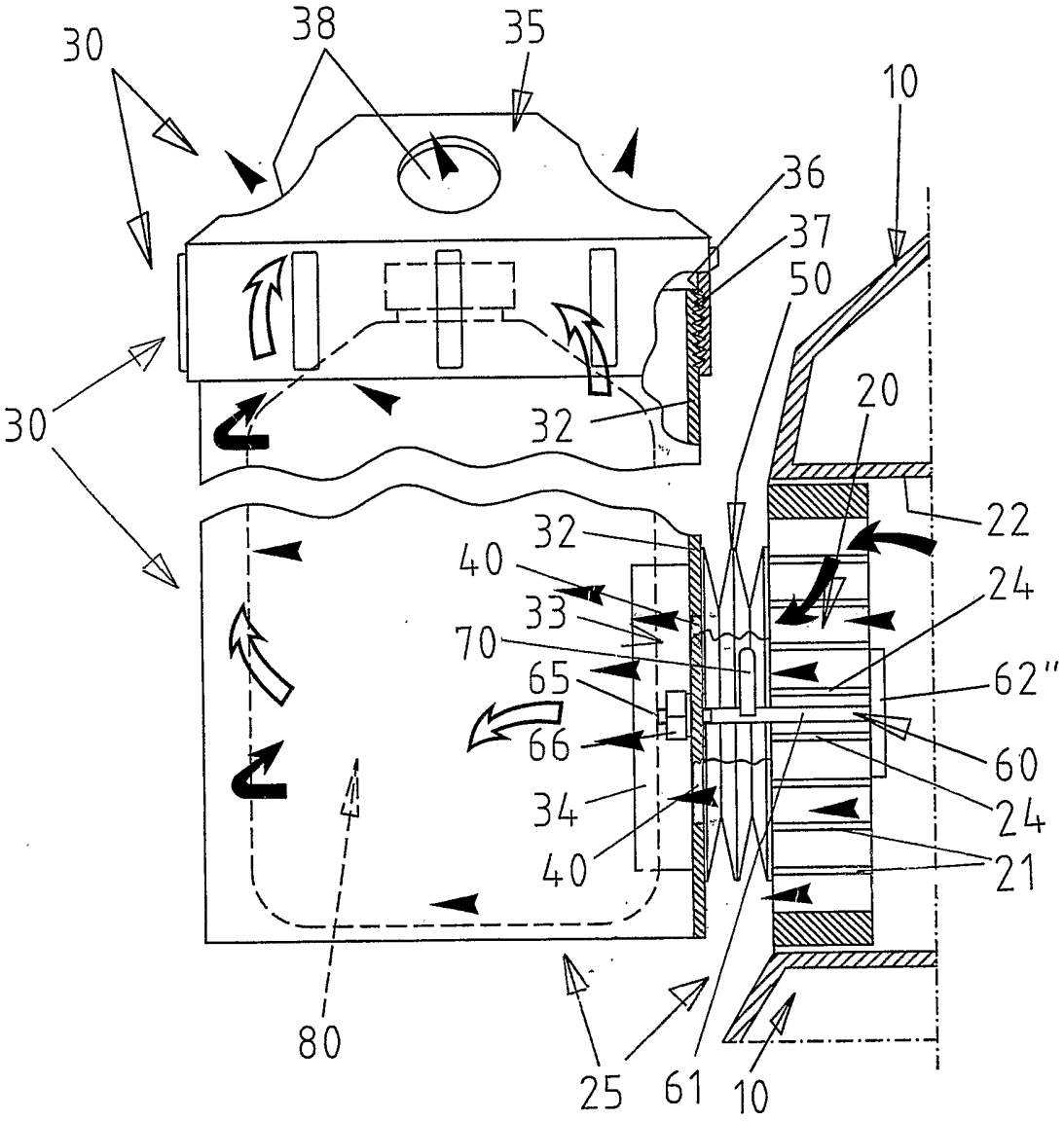
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FIG.5

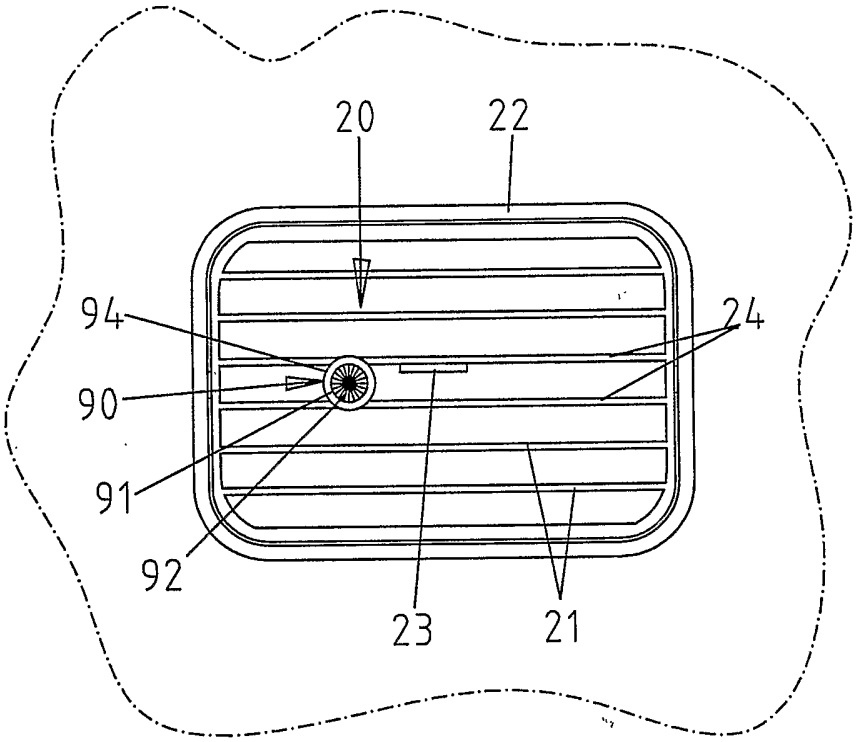


FIG.7

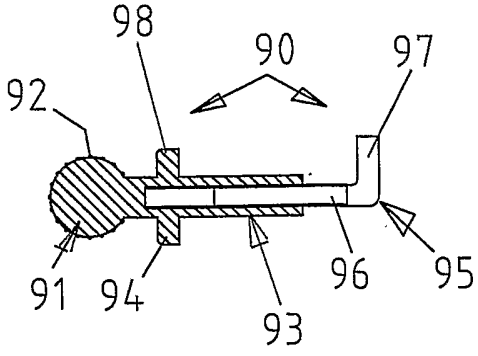
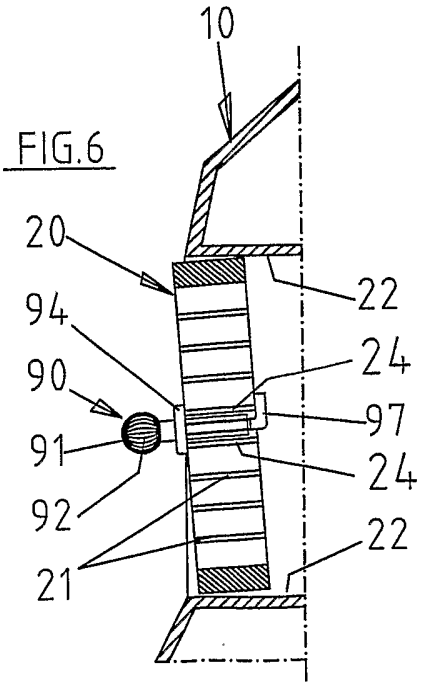


FIG.8

FIG.6



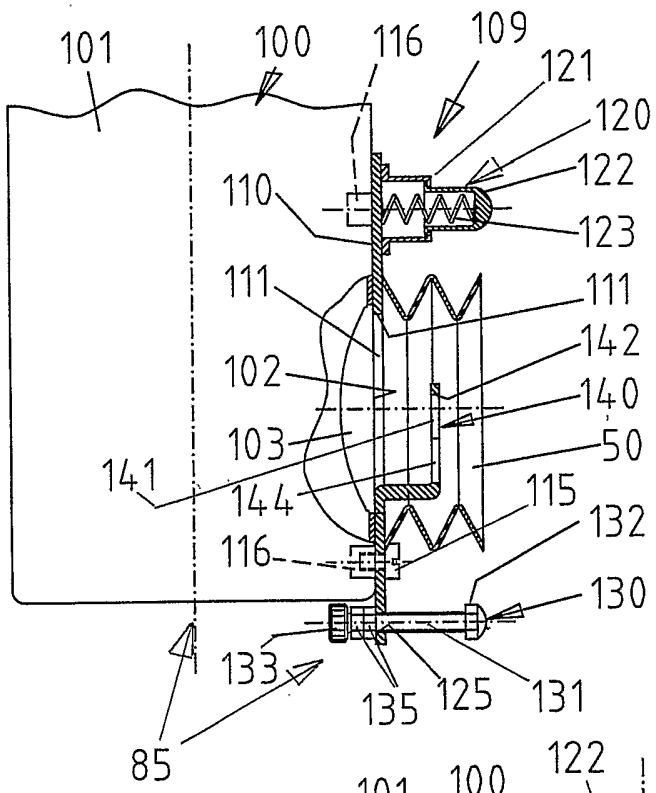


FIG.10

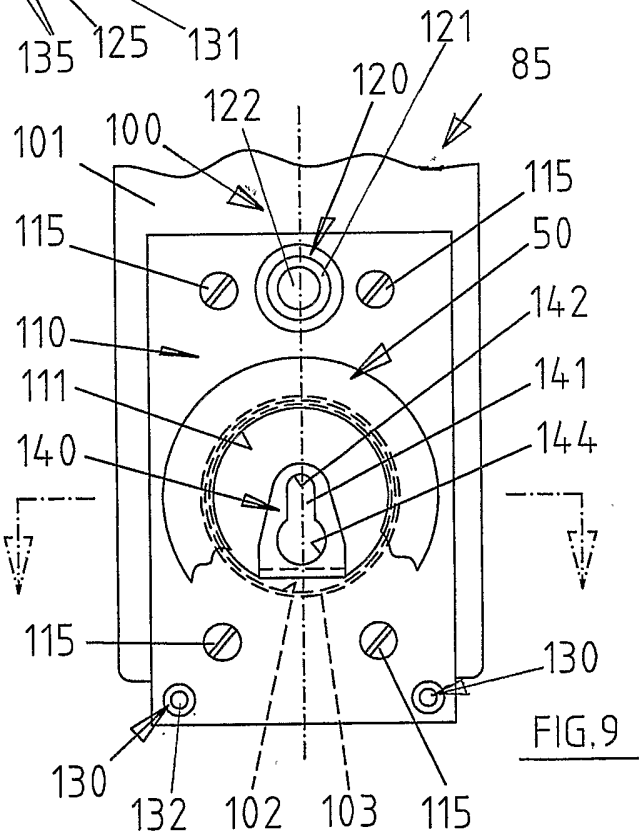


FIG.9

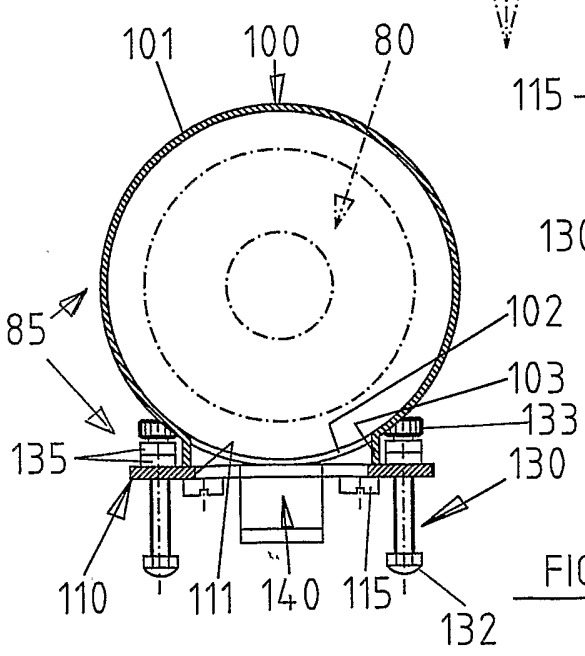


FIG.11

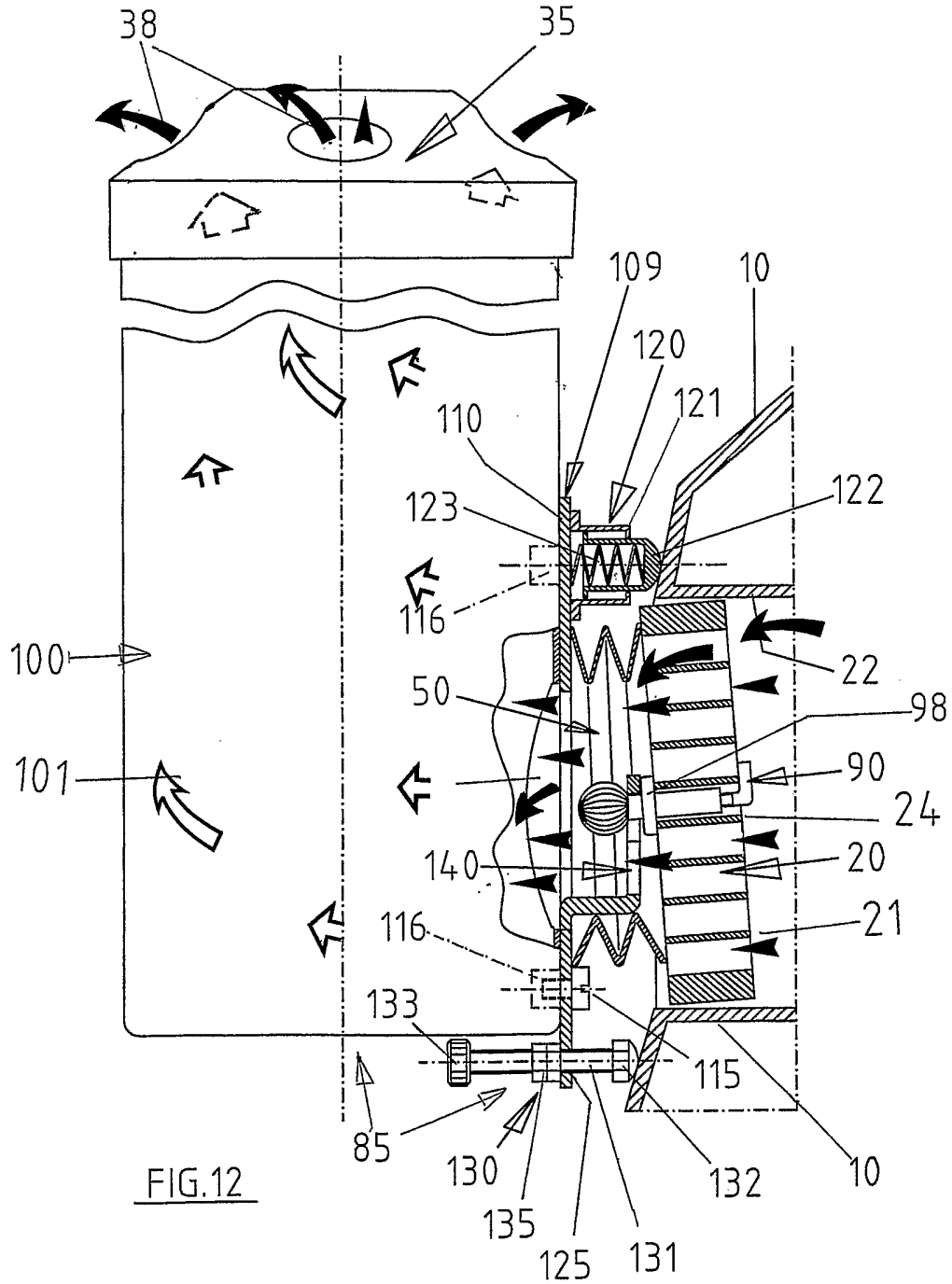

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FIG.12

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 01/00551

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B60N3/10 B60H1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B60N B60H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	EP 1 096 353 A (BRULE PATRICE) 2 May 2001 (2001-05-02) column 1, line 6 - line 9 column 4, line 34 -column 7, line 21; figures	1,3,5,6, 15,18,19 4,7,8, 16,17
Y	US 4 784 360 A (MOK PETER) 15 November 1988 (1988-11-15) column 5, line 20 - line 50; figures 2,3	4,7,8,16
Y A	US 5 913 452 A (WEIGL ADOLPH) 22 June 1999 (1999-06-22) column 2, line 43 - line 46; figures column 2, line 2	17
A	US 4 697 780 A (WENKMAN GREGORY J ET AL) 6 October 1987 (1987-10-06) figure 4	9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
18 June 2002	26/06/2002

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1096353 A	02-05-2001	FR 2800179 A1 EP 1096353 A1	27-04-2001 02-05-2001
US 4784360 A	15-11-1988	NONE	
US 5913452 A	22-06-1999	NONE	
US 4697780 A	06-10-1987	NONE	