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(54) Accessory of a radiator for room heating

(57) An accessory (2) of a radiator (1) for room heating, comprising at least a first type of longitudinal profile (6) in thermally conductive material for covering at least a longitudinal part of the radiator, the first type of profile (6) having an internal side wall (7) with a shape at least partially matching the perimeter side surface of the radiator part, an external side wall (8) suitable to considerably increase the thermal exchange surface of the radiator, and fins (9) for remote connection between the internal side wall and the external side wall delimiting channels (10) aiding the formation of convective hot air motions to increase the thermal yield of said radiator.

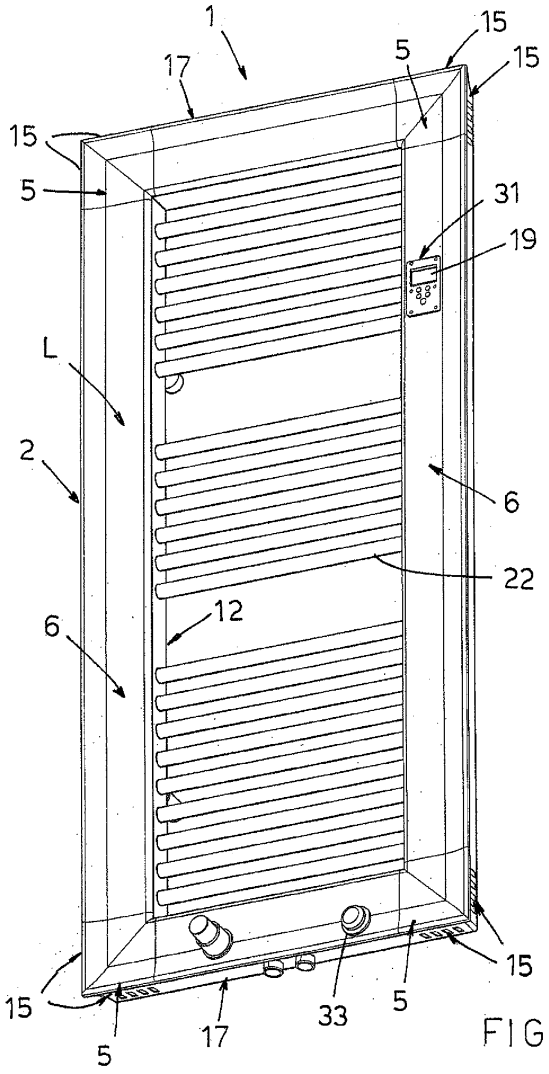

FIG.1

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Description

[0001] The present invention relates to an accessory of a radiator for room heating, whether of the type with water, electrical or mixed, braze welded or projection welded, notwithstanding the shape and the sections of the heating elements of which it is formed.

[0002] As it is known, radiators of the type described above comprise a plurality of heating elements (tubular or stamped sheet metal) in connection with a delivery manifold and a return manifold for the circulation of a carrier fluid.

[0003] The study of the configuration of the parts of which the radiator is composed is essentially aimed at maximising the thermal exchange surface and aiding the formation of convective hot air motions which in addition to the thermal exchange contributions by conduction and radiation increase the thermal yield of the radiator.

[0004] A limit to thermal yield is established by the current regulations on the subject which limit the surface temperature of the exposed parts of the radiator to a maximum value in order to prevent the danger of burns for the user.

[0005] The technical aim of the present invention is therefore to produce an accessory of a radiator for room heating which overcomes the technical drawbacks found in prior art.

[0006] Within this technical aim, an object of the invention is to produce an accessory of a radiator for room heating which allows the efficiency of the radiator to be improved, optimising thermal exchange by conduction, by radiation and by convection.

[0007] Another object of the invention is to produce an accessory of a radiator for room heating which allows more versatile regulation of the operating temperature of the radiator and greater saving in the running costs thereof.

[0008] A further object of the invention is to produce an accessory of a radiator for room heating which allows the radiator to be aesthetically improved.

[0009] The technical aim, and these and other objects, according to the present invention are achieved by producing an accessory of a radiator for room heating in conformity with claim 1.

[0010] The accessory in conformity with the present invention allows the thermal exchange surface to be increased and creates a series of channels which aid the formation of convective motions.

[0011] This determines a considerable improvement of the efficiency of the radiator.

[0012] In the case of an electrical or mixed radiator, with this accessory it is possible to increase the distance between the hottest point of the radiator, i.e. the area of installation of the electrical resistance, and the contact area accessible to the user.

[0013] This allows, with the same dimensions of the radiator, installation of an electrical resistance with higher power or several electrical resistances to manage several power levels with the consequent possibility of greater flexibility in regulating the operating temperature and obtaining a saving in the running costs.

[0014] Other features of the present invention are defined, moreover, in the subsequent claims.

[0015] Further features and advantages of the invention will be more apparent from the description of preferred but non-exclusive embodiments of the accessory of a radiator for room heating according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

- Fig. 1 shows a perspective view of a radiator having an accessory in conformity with a preferred embodiment of the invention;
- Fig. 2 shows a perspective view of the lower part of the radiator of Fig. 1;
- Fig. 3 shows a perspective view of a portion comprising a manifold of the radiator of Fig. 1; and
- Fig. 4 shows a plan view of a different preferred embodiment of the first type of profile of the accessory applied to the radiator.

[0016] Equivalent parts in the various embodiments are illustrated with the same numerical reference.

[0017] With reference to the aforesaid figures, there is shown a radiator 1 for room heating having an accessory 2.

[0018] The accessory 2 comprises at least a first type of longitudinal profile 6 in thermally conductive material, such as an aluminium alloy, for covering at least a longitudinal part 3 of the radiator 1.

[0019] The first type of profile 6, the longitudinal axis of which is indicated with L, has an internal side wall 7 with a shape at least partially matching the perimeter side surface 4 of the part of radiator 3, an external side wall 8 suitable to considerably increase the thermal exchange surface of the radiator 1, and fins 9 for remote connection between the internal side wall 7 and the external side wall 8, delimiting with the internal side wall 7 and the external side wall 8 longitudinal channels 10 suitable to aid the formation of convective hot air motions.

[0020] The channels 10 develop for the entire longitudinal length of the first type of profile 6. In the embodiments shown the first type of profile 6 has a rectilinear longitudinal axis to adapt to a part of radiator 3 with rectilinear longitudinal development.

[0021] The first type of profile 6 preferably also has guiding means 11 for longitudinal insertion on the part of radiator 3.

[0022] The guiding means 11 comprise angular formations 12 of the external 8 (Figs. 1-3) or internal 7 (Fig. 4) side wall of the first profile 6 configured so as to prevent lateral extraction of the first type of profile 6 from the longitudinal part of radiator 3.

[0023] The angular formations 12 develop from the opposite side ends 13 of the external 8 (Figs. 1-3) or internal 7 (Fig. 5) side wall and face each other frontally at a

distance so as to delimit a longitudinal groove 14.

[0024] Preferably, at least a second type of profile 5 is provided to be applied to the end of the first type of profile 6.

[0025] In a preferred solution the second type of profile 5 is provided with openings 15 for ensure and aid the convective flow of the hot air.

[0026] The second type of profile 5 can have means of known type, for example with mechanical coupling, for joining the first type of profile 6 to a third type of longitudinal hollow profile 17 which has an internal structure analogous to or even differing from that of the first type of profile 6.

[0027] The second type of profile 5 preferably describes an angle of 90° for an orthogonal junction between the first type of profile 6 and the third type of profile 17. The second type of profile 5 in particular has a preferably square (as shown) or curved longitudinal axis.

[0028] Advantageously, the accessory 2 seats at least one accompanying element therein for operation of the radiator 1.

[0029] An accompanying element can comprise a light display 19 having programming buttons and an electrical wire 21 for connection to a remote electronic controller 20.

[0030] Reference shall now be made to the particular, but non-limiting, case in which the radiator 1 is of the mixed type for heating a room for civil use.

[0031] The radiator is provided with heating elements 22 connected at the ends to a delivery manifold 23 and to a return manifold 24.

[0032] A first electrical resistance R1 is incorporated in the delivery manifold 23, with its supporting base 25 fixed externally to the lower end of the delivery manifold 23, while a second resistance R2 is incorporated in the return manifold 24, with its supporting base 26 fixed externally to the lower end of the return manifold 24.

[0033] The delivery 23 and return 24 manifold are connected inferiorly by a hydraulic fitting 27 having a two-way delivery 28 for the water, a two-way return 29 for the water and a seat 30 to seat a thermostatic valve.

[0034] A profile of the first type 6 covers the delivery manifold 23, a profile of the first type 6 covers the return manifold 24, a profile of the second type is applied to each longitudinal end of the two profiles of the first type 6, an upper profile of the third type 17 is connected between the two upper profiles of the second type 5, and a lower profile of the third type 17 is connected between the two lower profiles of the second type 5.

[0035] Each of the lower profiles of the second type 5 contains a corresponding supporting base 25 or 26. The lower profile of the third type 17 contains a hydraulic fitting 27. The profile of the first type 6 covering the return manifold 24 contains, preferably in one of its channels 10, the display 19 with the programming buttons which protrude from a front window 31 of the profile of the first type 6 covering the return manifold 24. The remote electronic controller 20 of the display 19 is contained in the lower profile of the third type 17, and this remote electronic controller 20 is connected to a switch 33, also contained in the lower profile of the third type 17 in a position substantially symmetrical with respect to the seat 30 seating the thermostatic valve. The electrical connection cable 21 runs through a channel 10 of the profile of the first type 6 covering the return connector 24, through the profile of the second type 15 at the lower end of the profile of the first type 6 covering the return manifold 24, and through the lower profile of the third type 17.

[0036] In a preferred embodiment, not shown, a tangential fan is present inside the upper profile of the third type 17 which connects the upper profiles of the second type 5, the fan being optionally associated with an electrical wire resistance and which sucks air from the channels 10 both of the first profile 6 covering the delivery manifold 23 and of the profile of the first type 6 covering the return manifold 24 and expels it through a specific opening of the profile of third type 17 in which it is contained, to establish a forced convective air motion in addition to the convective air motion that is established naturally along the channels 10 through chimney effect. Provision of the accessory 2 allows the distance between the hottest areas of the radiator 1 and the contact areas accessible to the user to be increased, so that it is possible to install a higher power, with respect to a conventional radiator of the same dimensions: in particular, the two resistances R1 and R2 are actuable individually or in combination on three power levels R1, R2 and R1+R2 and allow more effective and versatile temperature regulation, and saving in the running costs.

[0037] The thermal exchange efficiency is improved both by the presence of additional exchange surfaces created by the external side wall 8 and by the fins 9 of each profile of the first type 6 used, and by the presence of the channels 10 which optimise the formation of natural and/or forced convective air motions.

[0038] Installation of the accessory 2 on the radiator 1 is extremely simple and in particular each profile of the first type 6 is inserted longitudinally on the corresponding delivery 23 or return 24 manifold so that the heating elements 22 are slotted along the groove 14.

[0039] Longitudinal extraction of each profile of the first type 6 can be prevented through the effect of simple contact pressure or by means of specific mechanical stops, not shown.

[0040] During installation the groove 14 can be closed by special modular comb inserts 32 which can have both functional validity to prevent dirt from accumulating and aesthetic validity to conceal the weld area between the heating elements 22 and the manifolds 23, 24.

[0041] Naturally, the system for applying the accessory 2 to the radiator 1 can differ from the one shown. For example, the accessory 2 can be provided for this purpose with specific snap coupling members, or screw or interlocking fixing blocks or the like.

[0042] In particular, in a preferred embodiment, not shown, the first type of profile 6 can be composed of two

mutually associated half-parts which allow coupling of different materials, also with different colours or surface treatments.

[0043] This structure aids the application of accessories such as LEDs, backlights, hooks or towel bars, retractable, or perimeter finishing profiles in any material.

[0044] Moreover, the accessory can also comprise two elements of the first type 6 applied to the manifolds 23, 24 and optionally provided with elements of the second type 5 applied to close their ends.

[0045] The profiles forming the accessory can have countless shapes, dimensions, materials, colours and mechanical or galvanic surface treatments.

[0046] The accessory thus conceived is susceptible to numerous modifications or variants, all falling within the inventive concept; moreover, all details can be substituted by technically equivalent elements.

[0047] In practice, the materials used, and the dimensions can be any according to requirements and to the state of the art.

Claims

1. Accessory of a radiator for room heating, **characterised in that** it comprises at least a first type of longitudinal profile of thermally conductive material for covering at least a longitudinal part of said radiator, said first type of profile having an internal side wall with a shape at least partially matching the external side surface of said part of radiator, an external side wall suitable for increasing the thermal exchange surface of said radiator, and fins for the remote connection between said internal side wall and said external side wall delimiting longitudinal channels aiding the formation of convective hot air motions for increasing the thermal yield of said radiator.

2. Accessory according to claim 1, **characterised in that** said channels develop by the entire longitudinal length of said first type of profile.

3. Accessory according to one or more of the previous claims, **characterised in that** it seats at least one accompanying element therein for the operation of said radiator.

4. Accessory according to one or more of the previous claims, **characterised in that** said first type of profile has a rectilinear longitudinal axis.

5. Accessory according to one or more of the previous claims, **characterised in that** said first type of profile has guiding means for longitudinally inserting on said part of radiator.

6. Accessory according to one or more of the previous claims, **characterised in that** said guiding means comprise angular formations of said internal or external side wall of said first type of profile configured so as to lock the side extraction of said first type of profile from said longitudinal part of radiator.

7. Accessory according to one or more of the previous claims, **characterised in that** said angular formations develop from the opposite side ends of said internal or external side wall and face at a distance frontally from each other, so as to delimit a longitudinal groove.

8. Accessory according to one or more of the previous claims, **characterised in that** it comprises special modular comb inserts for closing said groove.

9. Accessory according to one or more of the previous claims, **characterised in that** said first type of profile is of an aluminium alloy.

10. accessory according to one or more of the previous claims, **characterised in that** it has at least a second type of hollow profile to associate to the end of said first type of profile.

11. Accessory according to one or more of the previous claims, **characterised in that** said second type of profile is provided with openings for air passage.

12. Accessory according to one or more of the previous claims, **characterised in that** said second type of profile describes an angle of 90° for an orthogonal junction between said first type of profile and a third type of profile.

13. Accessory according to one or more of the previous claims, **characterised in that** said accompanying element comprises a tangential fan optionally associated to an electrical wire resistance.

14. Accessory according to one or more of the previous claims, **characterised in that** said accompanying element comprises an electronic controller connected to a light display with programming buttons and/or to a switch.

15. Radiator for heating a room for civil use **characterised in that** it has an accessory according to one or more of the previous claims.

16. Electrical or mixed radiator according to the previous claim **characterised in that** it has a profile of said first type covering the delivery manifold, in turn incorporating a first electrical resistance, and a profile of said first type covering the return manifold in turn incorporating a second electrical resistance actuable individually or in combination with said first electrical resistance for the operation of said radiator on three

different power levels.

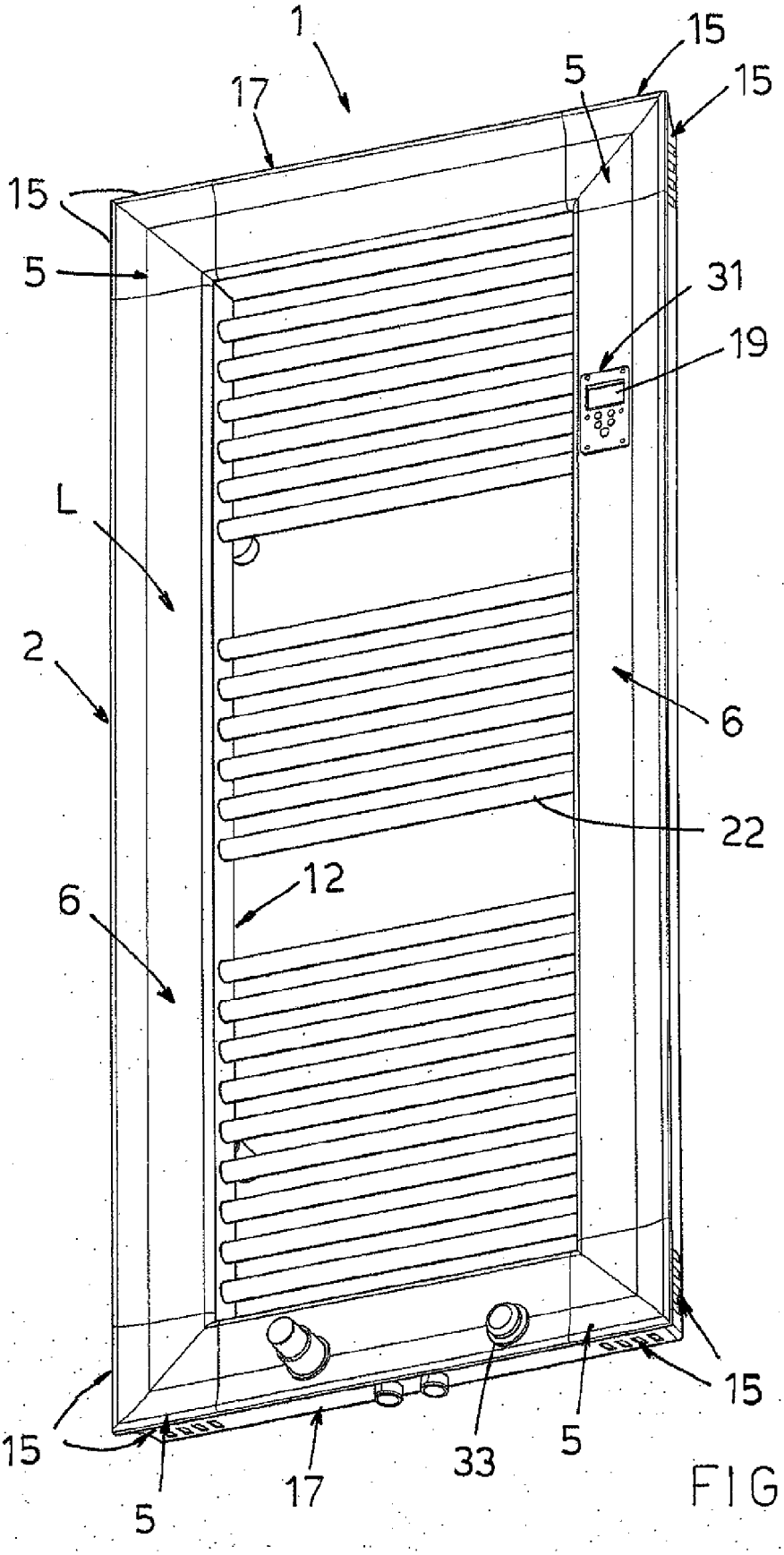

FIG.1

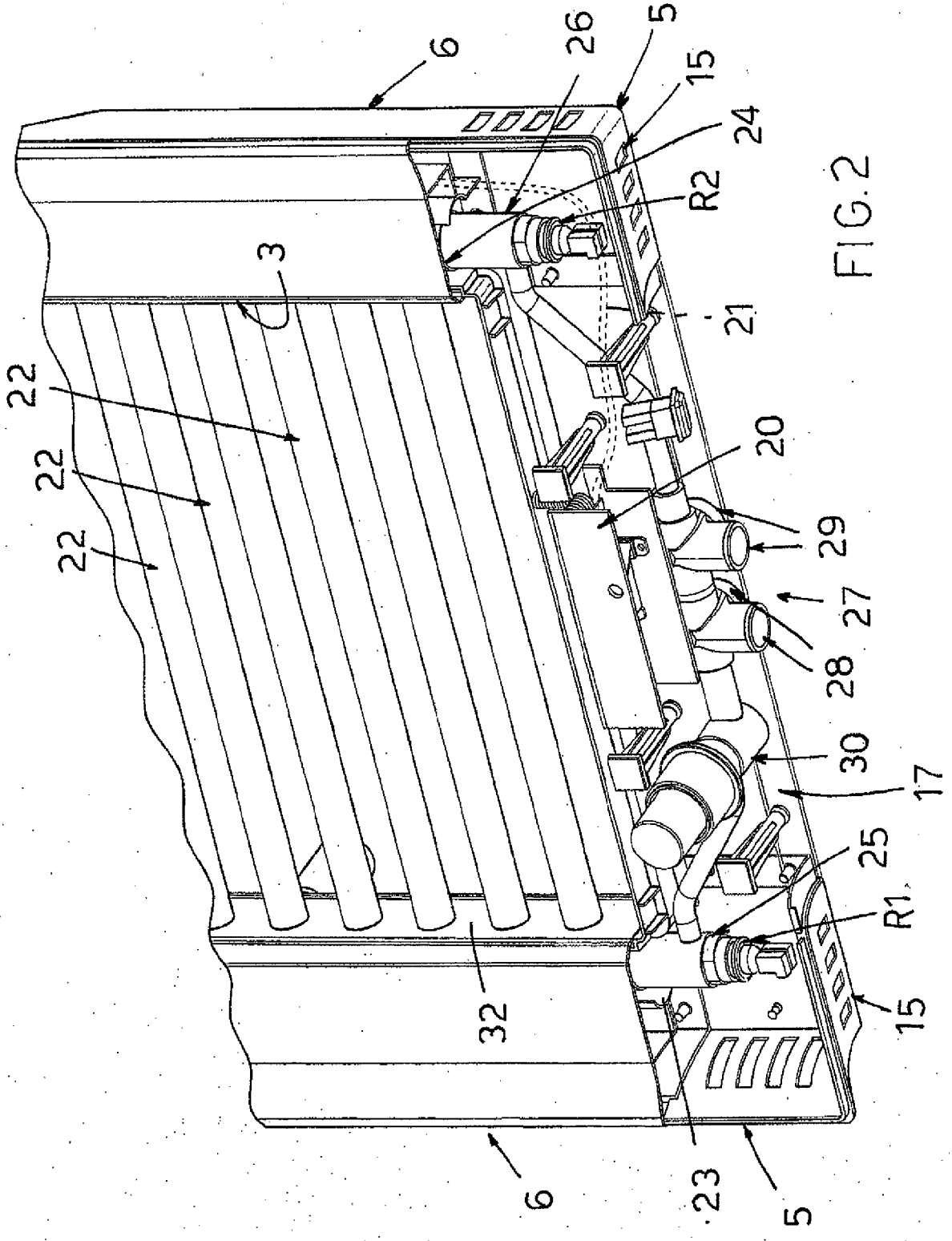

FIG.2

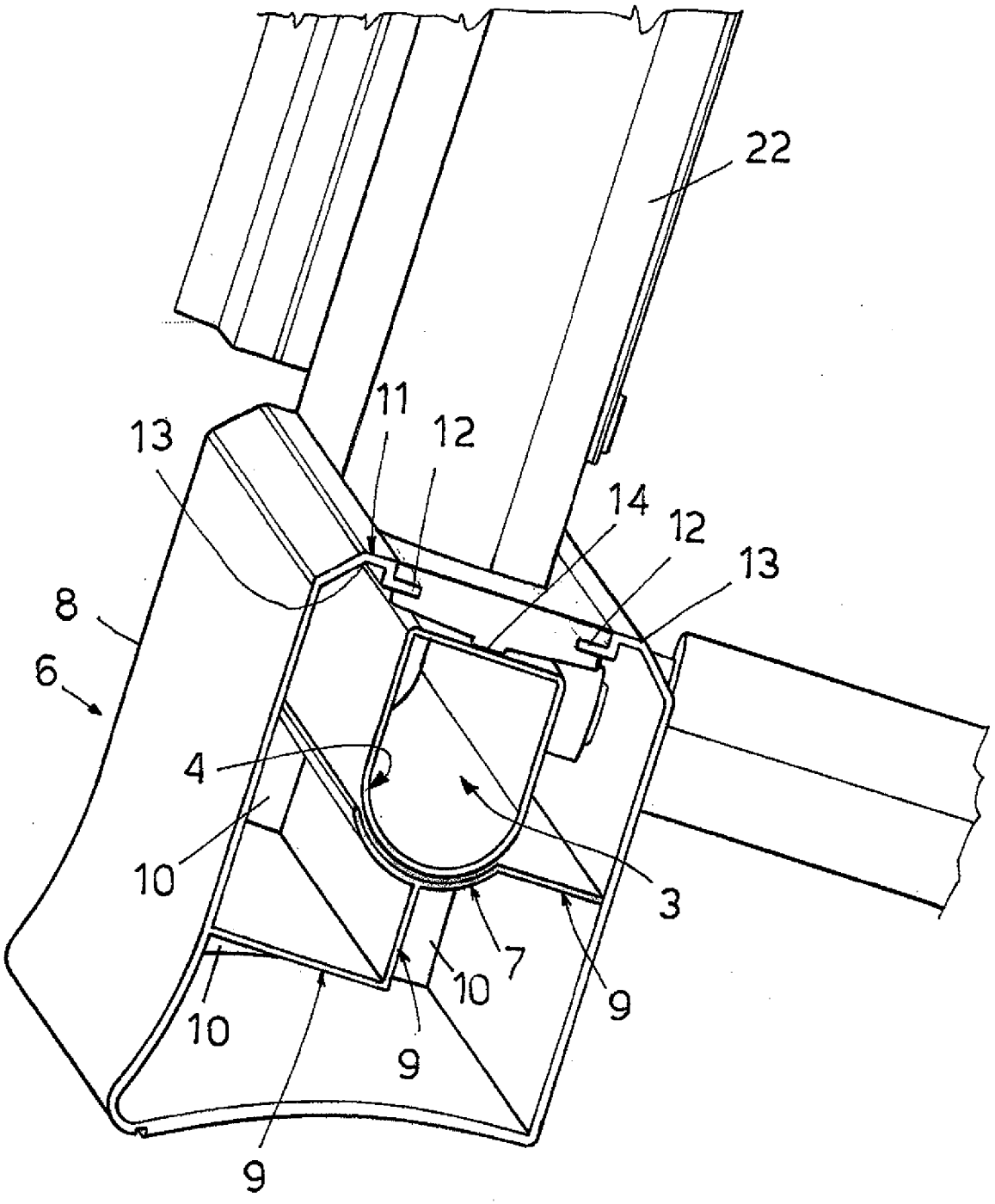

FIG.3

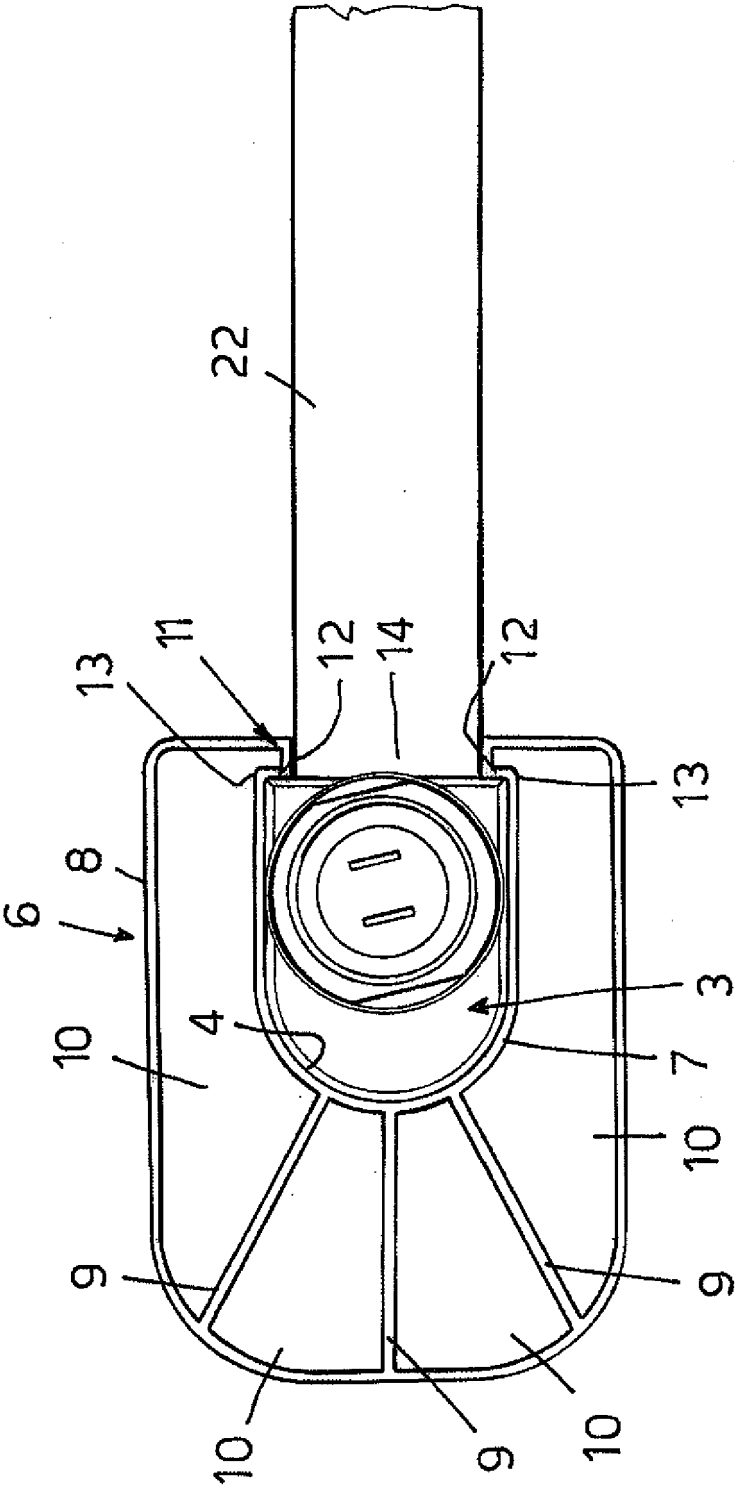

FIG4

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 0884

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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
Munich	28 July 2010	Leclaire, Thomas

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
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