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(54) **Towel radiator with pull-out elements**

(57) The object of the present invention is a towel radiator (1) for room heating comprising at least one heating element (11), equipped with distributor channels (13), which in the back envisage a gap (14) able to house internally, frontally hidden from view, a towel holder (2) able to switch from a closed configuration to an operating configuration and vice versa by means of a kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71) so as to provide, in the operating configuration, one or more support elements (2; 22) on which to hang objects of various kinds and/or serving as a purely aesthetic element.

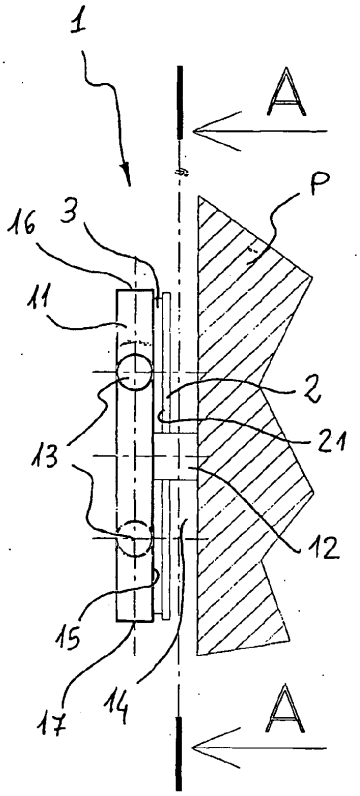

Fig. 1

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Description

[0001] The object of the present invention is a radiator, extruded or die-cast preferably in aluminium alloy, for room heating or similar applications, also having the function of "heated towel radiator".

[0002] The invention therefore comes within the sector of systems for room heating, in particular in the field of decorative radiators.

[0003] In this sector, a large number of radiators are already known having the dual purpose of heating the room in which they are installed and of keeping warm (or drying) towels and bathrobes (and/or, more generally, assorted linen). Variously shaped and realised according to the many different aesthetic methods, such radiators, commonly known as "heated towel radiators", of electric or fluid circulation type, are generally composed, as is known, of horizontal tubular elements, secured to vertical uprights, on which towels and/or linen to be warmed may be placed and hung.

[0004] Standardised production of this type, rarely optimally combines with existing radiators in the rest of the household, or with the decor and style of the room in which they should be installed; at the same time, the tubular structure poses major limitations in terms of construction and aesthetic variety.

[0005] Another drawback of ordinary towel radiators with horizontal tubular elements is the difficulty of cleaning and removing the accumulated dust from them, especially when compared to single body radiators.

[0006] Lastly, such towel radiators generally have excessive thermal power, due to their size, dictated not only by the necessity to heat the room in which they are installed, but also the necessity to hang linen and/or towels on their tubular elements.

[0007] The object of the present invention is to eliminate at least some of the drawbacks outlined above.

[0008] More specifically, the main object of the present invention is to indicate a radiator, for room heating, which is "conventional" in terms of shape and size, which comes within decorative radiators, but able to ensure all the uses and functions of a "heated towel radiator".

[0009] An additional object of the present invention is to indicate a towel radiator of simple construction whose design allows numerous aesthetic variants to be made available.

[0010] An additional object of the present invention is to indicate a towel radiator of reduced size and dimensions when not in operation.

[0011] These and other objects, as shall become clear hereinafter, are achieved with a radiator for room heating which conforms to the indications of the claims enclosed.

[0012] Additional characteristics of the present invention shall be better highlighted by the following description of some preferred embodiments, in accordance with the patent claims and illustrated, by way of a non-limiting example in the enclosed designs, wherein:

- figure 1 shows, schematically, an upper view of the radiator of the invention according to a first construction variant.
- figure 2 shows, schematically, a side view of the radiator of fig. 1.
- figures 3a and 3b show, schematically, a rear view of the radiator of fig.1 according to the section A-A respectively in its open and closed configuration.
- figure 4 shows, schematically, a rear view of the radiator of the invention according to a second construction variant.
- figures 5 and 6 show some aesthetic variants of the radiator of the invention.
- figures 7, 8a, 8b and 10 show, in multiple views, additional construction variants of the radiator of the invention.
- figure 11 shows a side view of an enlargement of a detail of the radiator of the invention according to its first construction variant.

[0013] The characteristics of the invention are now described using the references in the figures. Before proceeding with the description of the radiator of the invention, it is also necessary to state that, by way of non-limiting example, reference shall be made to extruded or die-cast heating elements that are elongated bodies where, by elongated body, henceforth shall be meant a body whose longitudinal dimension L is markedly greater than its transversal dimensions T (refer to figure 3a, for example): more precisely a body with $L \geq 2T$.

[0014] With reference to figure 1, therefore 1 denotes, as a whole, a towel radiator for room heating, including a heating element 11, basically flat, affixed and secured in a known manner to the wall P, of the room to be heated, by means of spacers 12 or equivalent means. Inside the heating element 11 are made one or more distributor channels 13, able to be put in communication with each other, for the entry and exit of the thermal carrier fluid destined to heat the room, equipped, as per prior art, with connections for the inlet and outlet valves of the thermal carrier fluid (also of monotube type) and for the bleeder valve of the air accumulated inside them. The course of the distributor channels 13 inside the heating element 11 of the radiator 1 is that according to prior art.

[0015] These channels 13 serve, alternatively, as a seat for electrical heating elements (e.g., of cartridge and/or sheathed type) in the event in which said heating element 11 is an element of an electric radiator 1.

[0016] The towel radiator 1 additionally includes a towel holder 2 secured, through kinematic mechanisms, to the heating element 11 and able to be moved, by movements parallel to the plane of the wall P that holds the towel radiator 1 itself, from a first non-operating configuration (or closed configuration) in which, housed in a gap 14, it is frontally hidden behind or inside the heating element 11, to an operating configuration in which, instead, it is visible and accessible for hanging towels, linen and/or other objects and garments.

[0017] The gap 14, according to a possible embodiment, may be obtained from the space created between the heating element 11 and the wall P if the first 11 is assembled on the second P by means of the spacers 12.

[0018] The kinematic mechanism that secures the towel holder 2 to the heating element 11 may impress on the former a translatory, roto-translatory or rotative movement.

[0019] According to a variant of the invention, an example of a movement by translation, illustrated in figures 1 to 3b, the towel holder 2 is a plate of reduced thickness able to alternatively translate along at least a horizontal rectilinear guide 3 affixed against the inner face 15 of the heating element 11. Figure 11 represents in detail the form of the rectilinear guide 3 and its cooperation with the carriage 4 tightly affixed to the rear face 21 of the towel holder 2. The cooperation between the guide 3 and the carriage 4 allows the securing of the towel holder 2 to the heating element 11 and allows its smooth sliding from a closed configuration (see for example fig. 3b) to an operating configuration (see for example fig. 3a) supporting, at the same time, its weight. Said rectilinear guide 3 may consist of a section, substantially shaped as a C, having a length equal to the desired translation applied to the towel holder 2 (and basically coinciding with the transversal dimension T of the heating element 11), in whose inner seat 31 the carriage 4, shaped as a C too, is housed.

[0020] For smoother sliding, the rectilinear guide 3 and the carriage 4 may be part of the known "ball bearing for axial sliding" and it is not necessary to dwell on such details here. Here, therefore, it is sufficient to note how, as per prior art, said ball bearing includes, in addition to said guide 3, a cage 6, tightly secured to it and projecting towards its inner seat 31, for the housing of multiple pairs of ball bearings 5 on which slides the carriage 4 of the towel holder 2. To enable this sliding, as is known, guide 3 and carriage 4 respectively envisage a first 32 and a second 41 pair of grooves, extending for their entire length, which serve as seats for such sliding ball bearings 5.

[0021] Although not shown in the enclosed figures, the guide 3 and the relative carriage 4 envisage known slide stop means cooperating with each other.

[0022] It is clear how the number of rectilinear guides 3 affixed to the heating element 11 and, consequently, that of the carriages 4 on the towel holder 2 depends on the height L of the heating element 11 itself. With reference to the variants of the enclosed figures, it was found that optimum sliding of the towel holder 2 may be achieved by envisaging at least two rectilinear guides 3 respectively affixed in proximity to the upper and lower edge of the inner face 15 of the heating element 11.

[0023] In light of this, and as already in part anticipated, the towel holder 2 is thus able, by means of the cooperation between said guides 3 and relative carriages 4, to translate axially from a closed configuration (or rest), during which it is located inside the gap 14 hidden from view by the heating element 11, to an operating configuration during which it is able to perform the functions for which it was designed.

[0024] In the operating position, in fact, the towel holder 2 (which also has an aesthetic function) projects equally, according to requirements, completely or partially, from one of the two lateral sides 16, 17 of the radiator 1 thus providing the user with support elements 22 for hanging towels, bathrobes and/or linen in general. By way of example of the variability of attainable forms, with reference to figure 5, said support elements 22 consist of holes and/or semi-holes of various sizes randomly drilled in the plate which constitutes the towel holder 2, while the aesthetic variant of fig. 6 has the "teeth" of a comb-shaped towel holder 2. Moreover, nothing prevents that said support elements 22 may consist of handles, hooks or similar means (not shown) tightly secured to the towel holder 2.

[0025] A second variant illustrative of a roto-translational movement is now described.

[0026] This construction variant is shown in detail in figure 4, where the towel holder 2 is secured, in its upper and lower edge, by first pins 23, to a pair of arms 7 able to rotate around second pins 71 which affix them to the inner face 15 of the heating element 11. As a result of this kinematic motion, the towel holder 2 is able to roto-translate (in the clockwise direction of the arrow F) inside the gap 14 to switch from the closed configuration (dotted line in fig. 4) to the operating configuration during which, as already widely stated, it exits from one of the lateral sides 16, 17 of the radiator 1 providing support elements 22 (in the many aesthetic variants) on which to hang linen and/or towels.

[0027] Also for this variant must be envisaged limit stop means. For example, on the inner face 15 of the heating element 11 may be envisaged a first stop means 25, in proximity to its lateral face 16, able to stop, during the opening phase, roto-translational movement of the towel holder 2 when it comes into contact with its base 24 and a second stop means 26, at the opposite lateral face 17, which stops the roto-translation of the towel holder 2 during the closing phase. Moreover, it is necessary to clarify how the towel holder 2 in the closing phase should also overcome its "upper dead centre" in order to prevent accidental and unwanted reopening.

[0028] In addition, nothing prevents there being envisaged a simplified variant of the aforesaid described radiator 1, according to which the towel holder 2 may switch from its closed configuration to its operating configuration (and vice versa) exclusively as a result of its rotation. According to this variant, shown in detail in figure 7, the towel holder 2 and its related arms 7 may be expressed and simplified in an arm 2 able to rotate around the pin 71 with which it is secured, at its base 24, to the inner face 15 of the heating element 11. Rotating around pin 71 (by an angle basically ≥90°), the arm 2 may then switch from a closed configuration, during which it is hidden from view, in a vertical position, inside the gap 14, to an op-

erating configuration (and vice versa) in which, projecting horizontally from one of the lateral sides of the heating element 11, it provides a support on which to hang linen and/or towels. Even in this simplified variant, on the inner face 15 of the heating element 11, in proximity to the pin 71, must be envisaged a rotation stop means 27 for the arm 2 in the closing phase.

[0029] On the inner face 15 of the heating element 11 may also be secured, by a second pin 72, around which is able to rotate, also a second arm 2. The first and second arm 2 are preferably affixed to said heating element 11 symmetrically with respect to the B-B axis (see fig. 8a), so as to rotate in opposite directions to each other; for the radiator 1 of figure 8a, it is therefore possible to envisage an operating configuration during which one of the two, or both, of the arms 2 have been rotated until a basically horizontal position and projecting from the respective lateral sides 16, 17 of the radiator 1 itself.

[0030] According to this last variant, it is also necessary that, in its closed configuration (i.e. with both arms 2 abutting with their respective stop rotation means 27), the two arms 2 lie on two different vertical planes, but parallel to each other (as clearly shown in fig. 8b) so as to avoid interference between each other. Such condition is easily achieved by equipping the two arms 2 with rotation pins 71, 72 of different lengths.

[0031] Moreover, nothing prevents both arms 2 being affixed to the heating element 11 at the same lateral face 16, 17 but at different heights.

[0032] Handles or equivalent handholds, although not shown, may be envisaged on the towel holder 2 to facilitate its extraction, roto-translation or its manual rotation from the closed configuration to the operating configuration and vice versa. Finally, it is essential to specify also how the appearance of the heating element 11 shown in the enclosed figures is just one of many possible and achievable configurations, as well as many types and aesthetic variants of the towel holder 2 and its support elements 22. By way of a non-limiting example, the figures from 9a to 10 show a "half-shell" shaped heating element 11, a geometry which is particularly used in the field of decorative radiators for its clean lines and elegant simplicity.

[0033] Again with reference to the aforesaid figs. from 9a to 10, it is also interesting to note how the heating element 11 equipped with the relative towel holder 2 may be combined with a second heating element 11, preferably, but not necessarily, equivalent to the first, rather than being directly affixed to the wall P. According to this additional variant, the spacers 12, as well as enabling the coupling of such heating elements 11, defining between them the gap 14 for housing the towel holder 2 in its many construction and aesthetic varieties, may possibly put in communication their distributor channels 13 in the event of fluid circulation type radiators 1.

[0034] The gap 14 to house the towel holder 2 may be, alternatively, also the space between a first portion 11.a and second portion 11.b of the same heating element 11 suitably shaped for its creation.

[0035] It therefore seems clear how a radiator, for room heating as described, achieves the preset objects, in particular that of installing a "conventional" radiator 1 (in terms of shape and size) for room heating which, if required, may also be used as a heated towel rail on which to hang and keep warm (especially during the cold season due to the heat generated by the heating elements 11 of the radiator 1 with which, as seen, the towel holder 2 is in direct contact) various items of linen, garments and/or towels.

[0036] Lastly, the radiator 1 of the invention ensures, as seen, a wide range of aesthetic combinations, construction varieties and reduced size when not in use, thus making it particularly suitable for installation in any environment and for any application.

Claims

1. Towel radiator (1) for room heating including at least one heating element (11), equipped with distributor channels, (13) **characterised in that**
said at least one heating element (11) in the back envisages a gap (14) able to house internally, frontally hidden from view, a towel holder (2) able to switch from a closed configuration to an operating configuration and vice versa by means of a kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71), said towel holder (2) providing, in the operating configuration, one or more support elements (2; 22) on which to hang and place objects of various kinds and/or serving as a purely aesthetic element.

2. Towel radiator (1) for room heating according to the previous claim, **characterised in that**
said gap (14) is the space included between said at least one heating element (11) and a wall (P) of the room to be heated in which said heating element (11) is affixed by means of spacers (12).

3. Towel radiator (1) for room heating according to claim 1, **characterised in that**
said gap (14) is the space included between a first (11.a) and second (11.b) portion of said heating element (11).

4. Towel radiator (1) according to the previous claim, **characterised in that**
said first (11.a) and second (11.b) portion are secured together by means of spacers (12).

5. Towel radiator (1) for room heating according to any previous claim, **characterised in that**
said kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71) includes:

- a horizontal rectilinear guide (3) affixed to the

inner face (15) of one of said heating elements (11)

- a carnage (4) tightly affixed to the rear face (21) of said towel holder (2) that is housed and able to translate axially in the inner seat (31) of said guide (3),

said bearing allowing a translation of said towel holder (2) from said closed configuration to said operating configuration and vice versa.

6. Towel radiator (1) according to the previous claim, **characterised in that** said kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71) additionally includes a cage (6), tightly secured to said rectilinear guide (3) and projecting towards its said inner seat (31), to house multiple pairs of sliding ball bearings (5) on which slides said cage (4), on said guide (3) and carriage (4) being envisaged a first (32) and second (41) pair of grooves extending for their entire length which serve as seats for said sliding ball bearings (5).

7. Towel radiator (1) for room heating according to any previous claim, **characterised in that** said horizontal rectilinear guide (3) has a length basically equal to the transverse dimension T of said at least one heating element (11), said towel holder (2) being able to translate along said guide (3) until exiting equally and alternatively from one of the two lateral sides (16, 17) of said radiator (1).

8. Towel radiator (1) for room heating according to any previous claim excluding claims 5, 6 and 7, **characterised in that** said kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71) includes a pair of arms (7) each of which is secured by a first pin (23) to said towel holder (2) and by a second pin (71) to the inner face (15) of said at least one heating element (11), said pair of arms (7) allowing roto-translation of said towel holder (2) from said closed configuration to said operating configuration and vice versa.

9. Towel radiator (1) for room heating according to the previous claim, **characterised in that** on the inner face (15) of said at least one heating element (11) are envisaged a first (25) and second (26) stop means able to stop the roto-translatory movement of said towel holder (2) respectively during the opening phase towards the operating configuration and during the closing stage.

10. Towel radiator (1) for room heating according to any previous claim, **characterised in that** said towel holder (2) is a plate of reduced thickness variously shaped and equipped with support elements (22) for hanging objects, particularly linen and/or towels and/or garments.

11. Towel radiator (1) for room heating according to claim 2 or 3 or 4, **characterised in that** said kinematic mechanism (3, 31, 32, 4, 41, 5, 6; 23, 7, 71; 71) is a pin (71) able to secure said towel holder (2), at its base (24), directly to the inner face (15) of said at least one heating element (11), said pin (71) allowing rotation of said towel holder (2) from said closed configuration to said operating configuration and vice versa.

12. Towel radiator (1) for room heating according to the previous claim, **characterised in that** said towel holder (2) consists of at least a first arm (2) able to rotate around said pin (71), said arm (2) providing, in the operating configuration, a support for objects of various kinds, in particular linen and/or towels and/or garments.

13. Towel radiator (1) for room heating according to the previous claim, **characterised in that** said towel holder (2) may include a second arm (2) secured, by a second pin (72), to the inner face (15) of said at least one heating element (11), said second arm (2) being able to rotate around said second pin (72), to switch from its closed configuration to its operating configuration and vice versa.

14. Towel radiator (1) according to the previous claim, **characterised in that** said first and second arms (2) are affixed to said inner face (15) of said heating element (11) symmetrically with respect to its B-B axis, the rotation of said second arm (2) around said second pin (72) being in the opposite direction to that of said first arm (2) around said first pin (71).

15. Radiator (1) for room heating according to the previous claim, **characterised in that** said first (71) and second (72) pins are of different lengths, said first and second arms (2) lying on two different vertical planes, but parallel to each other, so as to avoid any interference in the closed configuration.

16. Radiator (1) for room heating according to any previous claim, **characterised in that** it is a fluid circulation type radiator, said distributor channels (13) being traversed by the thermal carrier fluid destined to room heating.

17. Radiator (1) for room heating according to any previous claim except claim 16, **characterised in that** it is an electric radiator, said distributor channels (13) being the seats for electrical heating elements.

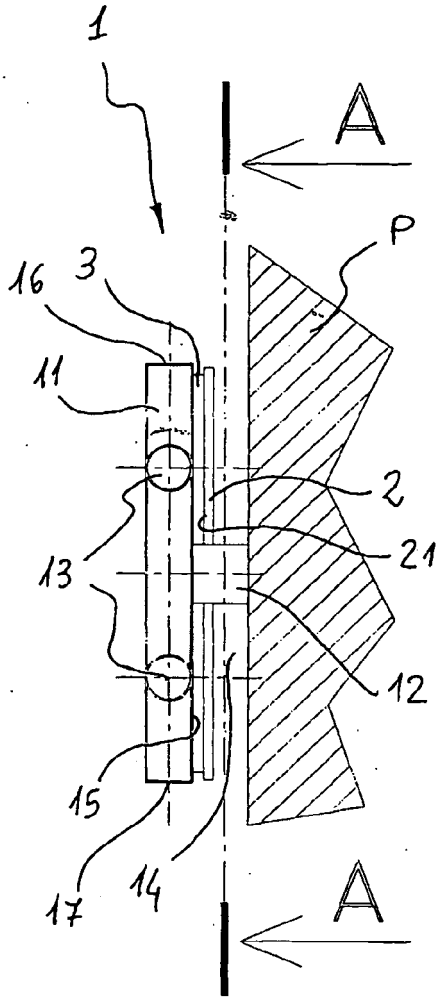

Fig. 1

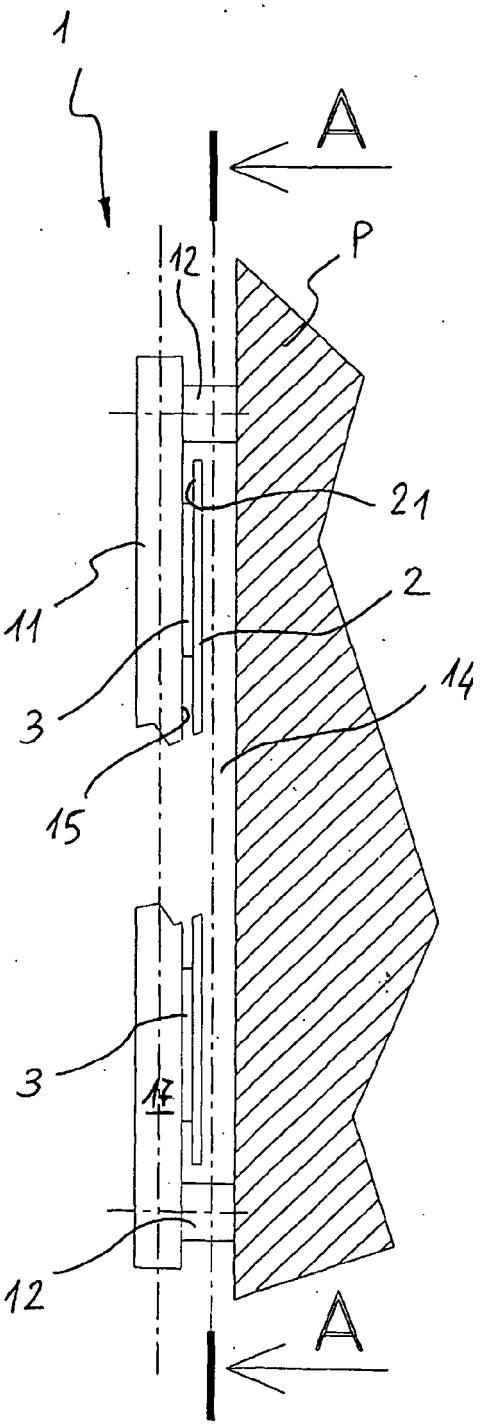

Fig. 2

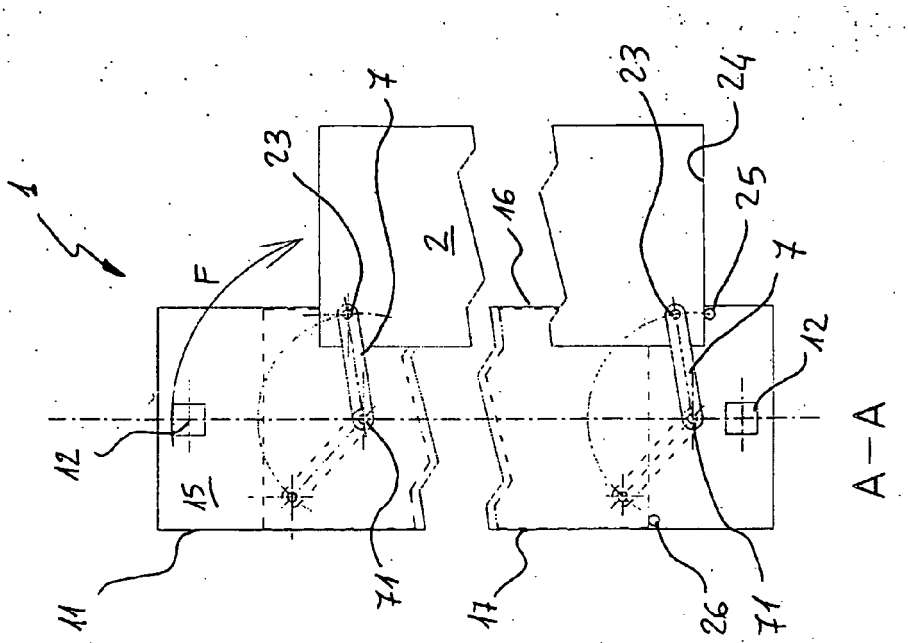

Fig. 4

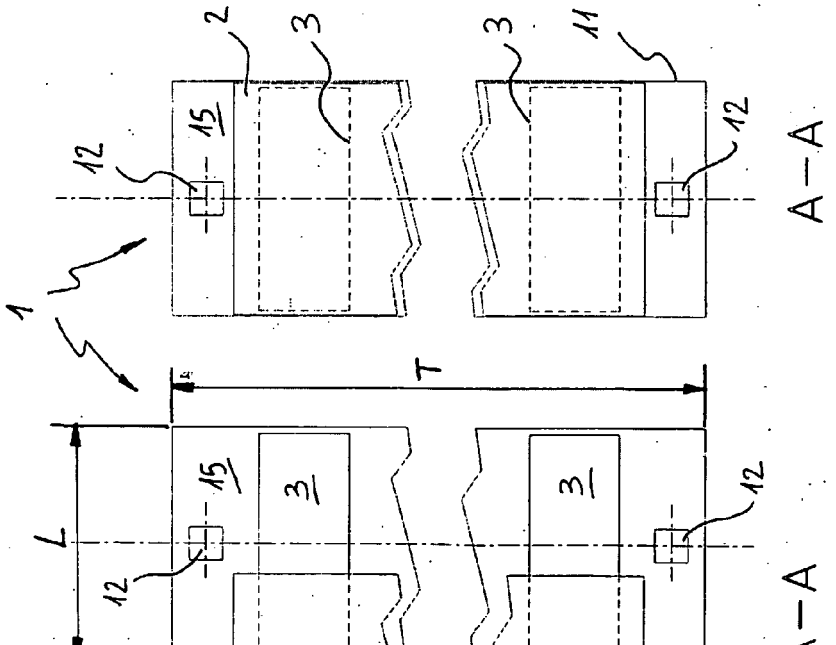

Fig. 3b

Fig. 3a

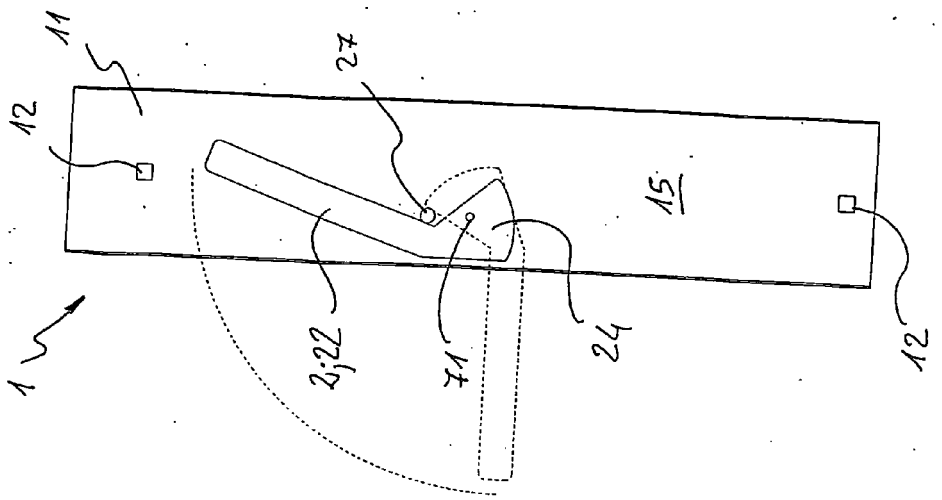

Fig. 7

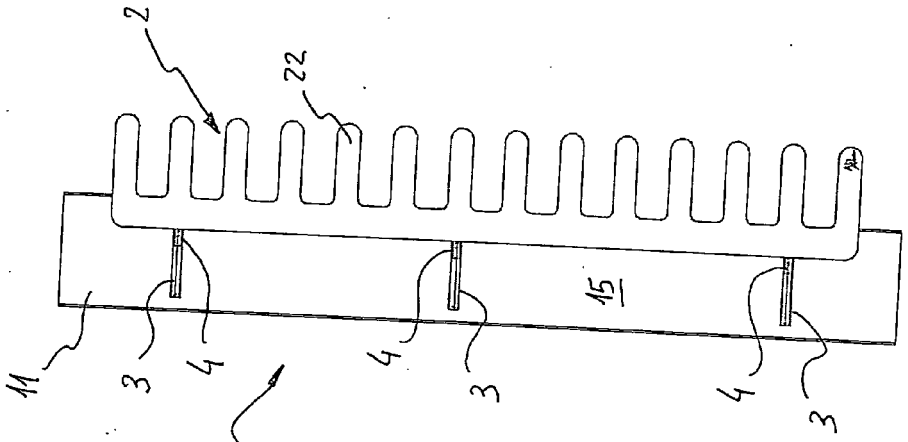

Fig. 6

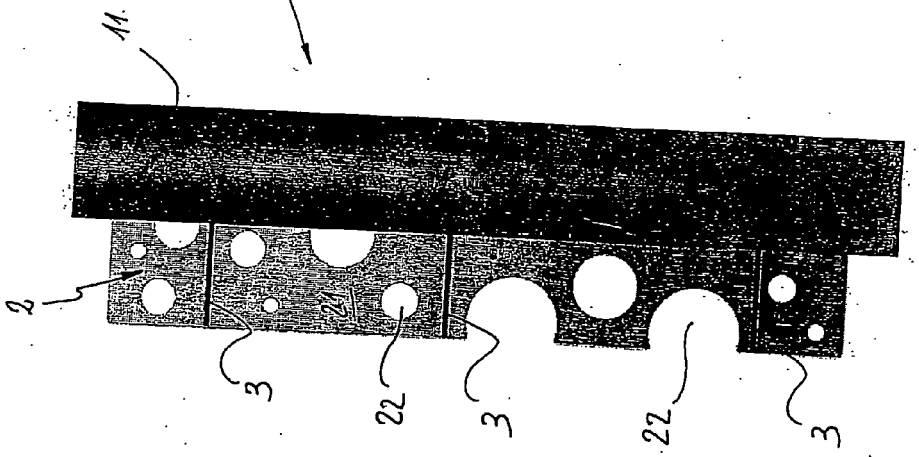

Fig. 5

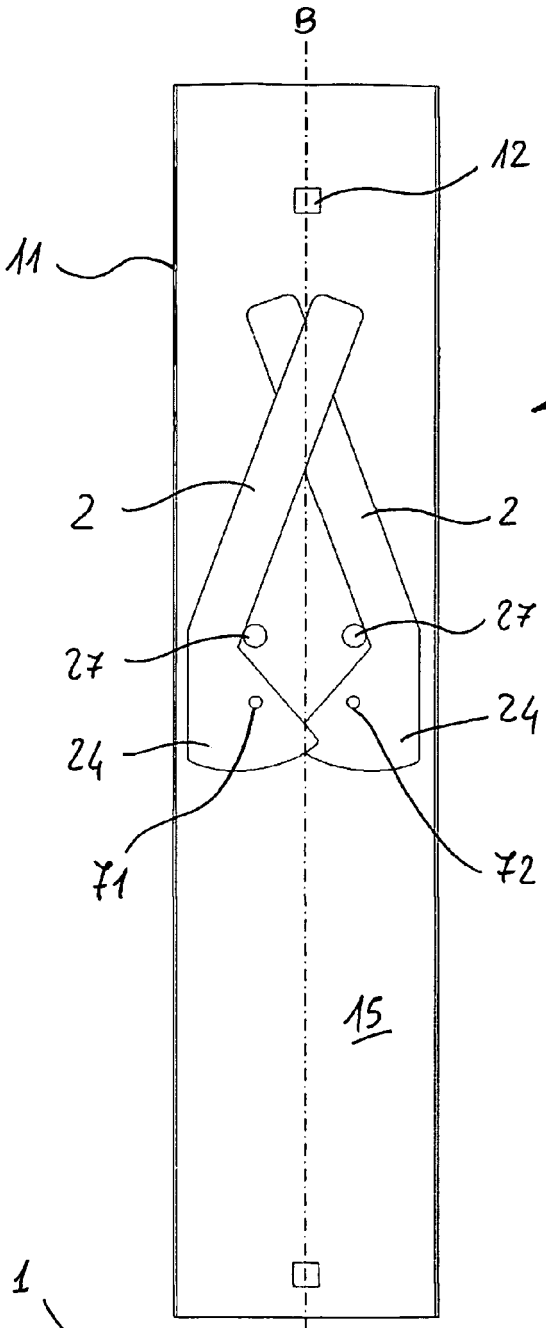

Fig. 8a

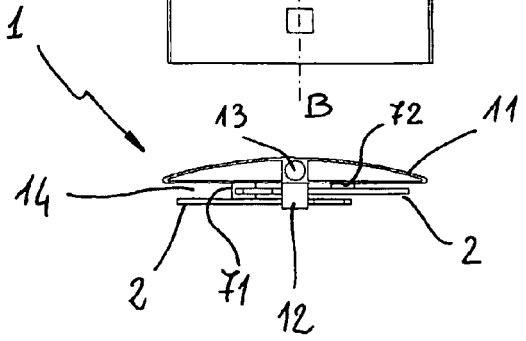

Fig. 8b

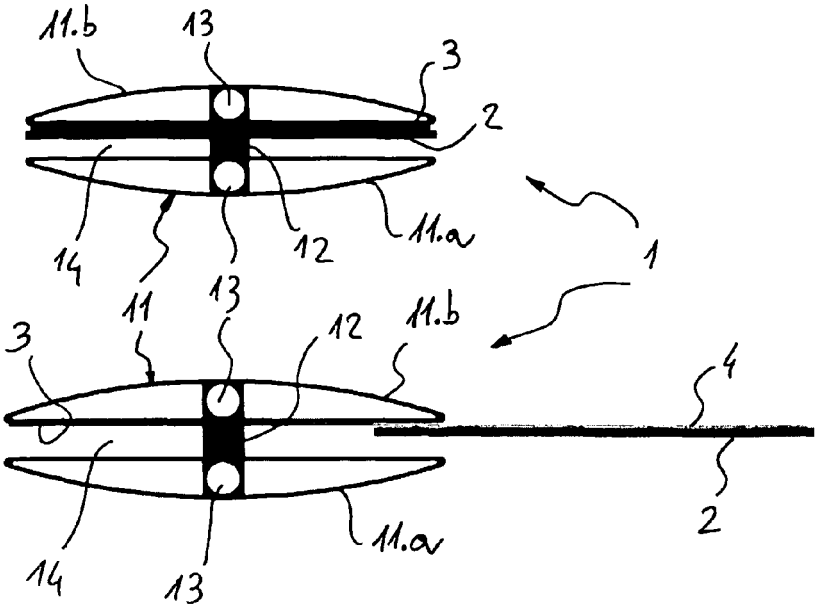

Fig. 9a

Fig. 9b

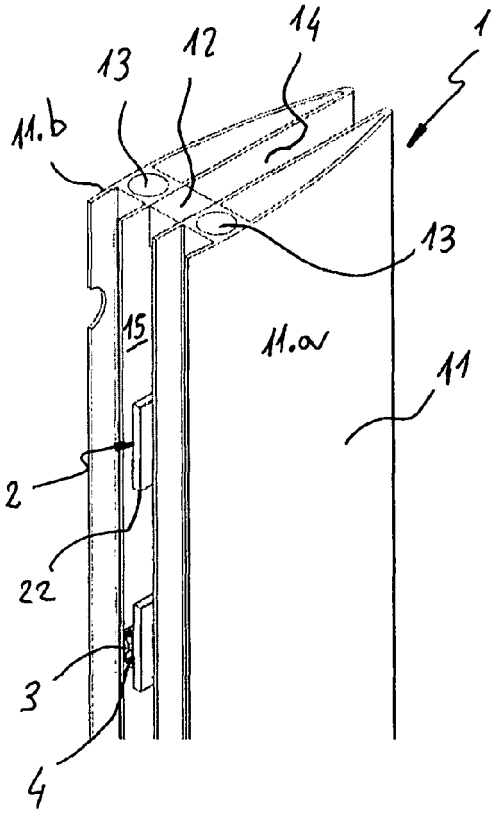

Fig. 10

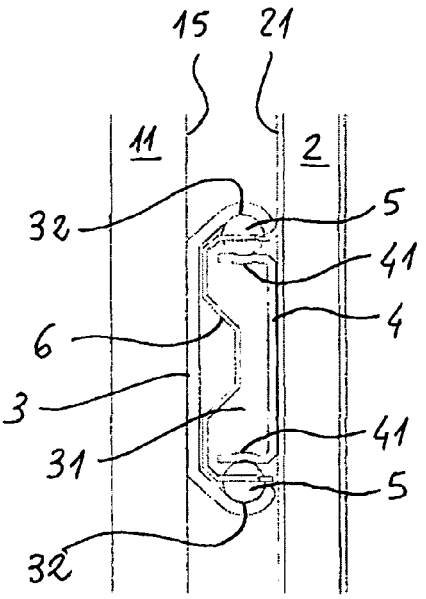

Fig. 11