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(54) Device for anchoring a heating radiator to a wall

(57) Device for anchoring a heating radiator (1) to a wall, said device comprising a pair of support groups (A, B) for the lower base of the radiator, said groups being fixed to the wall and said lower base (1a) of said radiator (1) being free to rotate about said groups, and an anchoring group (C) for removably anchoring the upper base (1b) of the radiator (1) to the wall, wherein the support groups (A, B) and the anchoring group (C) are arranged at the sides of said radiator (1).

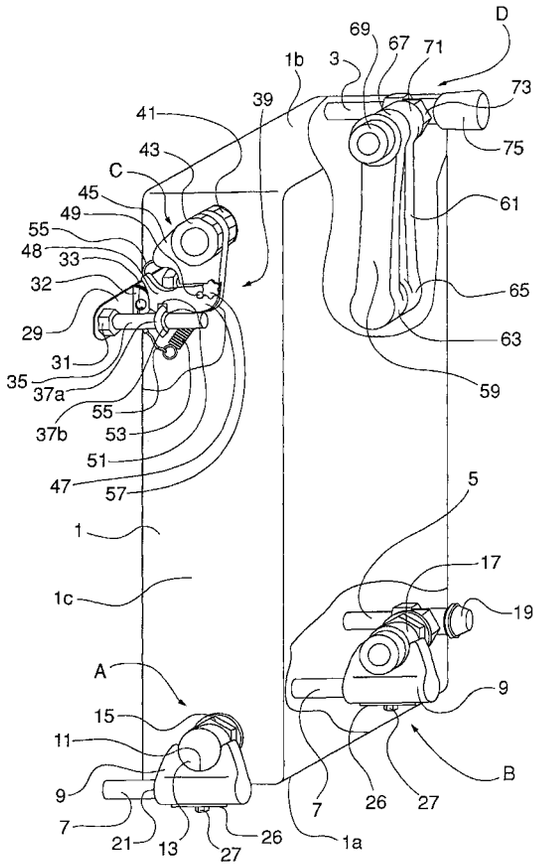

Fig. 1a

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Description

[0001] The object of the present invention is a device for anchoring a heating radiator to a wall.

[0002] In particular, the invention concerns a device for anchoring a heating radiator to a wall, said device allowing to incline said radiator with respect to the wall on which it is mounted.

[0003] It is known that it is difficult to reach the portion of wall located behind a heating radiator. In fact, the distance between said wall and said radiator is small and it is possible to operate on said wall, for painting or cleaning operations, only with great difficulty and with poor precision.

[0004] Various attempts have been made for solving the above mentioned problem.

[0005] Devices are known for fixing a heating radiator to a wall. In said devices, a pair of side hinges is provided for the lower base of the radiator so that said radiator can be made to pivot about an axis passing through said hinges and parallel to the floor and to the wall on which said radiator is mounted, and so that the upper base of said radiator can accordingly be moved away from said wall.

[0006] Said devices comprise means for anchoring the upper base of the radiator to the wall. Said means maintain the radiator in vertical position and the user must release them for allowing the rotation of the radiator and for moving its upper base away from the wall.

[0007] Devices of the above mentioned type are described, for instance, in the European patent EP 777,086, in the German patent DE 19,912,598 and in the British patent GB 2,148,097.

[0008] However, the known solutions generally present the inconvenience of being applicable only to new installations of recent type with thin radiators and in which the water feeding and the water outlet are both provided at the lower base of the radiator.

[0009] In said type of installations, the realisation of an anchoring device allowing to recline the radiator is favoured by the fact that when the upper base of said radiator is moved away from the wall, it is not connected to any piping, and that, if the pipe on which the water feeding and the water outlet are positioned coincides with the rotation axis of the radiator, it is possible to realise a device interfering only marginally with the hydraulic system of the radiator.

[0010] On the other hand, it is not possible to apply the known devices to an already existing installation of traditional type with thick radiators and, most of all, in which only the water outlet is present in the lower part of the radiator while the water feeding involves the upper part of said radiator.

[0011] It is a main object of the present invention to provide an anchoring device for heating radiators applicable both to a new installation and to an already existing installation of traditional type, said device allowing to incline the radiator with respect to the wall to which it is fixed, without being it necessary to remove said radiator or to stop the system.

[0012] A further object of the present invention is to realise an easily operable device that the user can employ without the need to resort to any tool and that provides at the same time for means able to prevent accidental and potentially dangerous movements of the radiator.

[0013] This and other objects of the invention are obtained by means of a device for anchoring a heating radiator to a wall as claimed in the hereby attached claims.

[0014] Generally speaking, the device according to the invention provides for two supports or parallel brackets on which the lower part of a radiator can rest and with respect to which the lower base of said radiator remains free to rotate.

[0015] Said device further provides for an anchoring group of the upper base of the radiator comprising means for maintaining said radiator in vertical position and control means for releasing said upper base of the radiator and for allowing its rotation.

[0016] Advantageously, both the lower supports and the anchoring group are mounted in correspondence with the most external elements of the radiator itself, said elements presenting a standardised thread. In this way, the device according to the invention is universal since it can be applied to radiators of whatever size and make.

[0017] The applications of the device according to the invention to installations of traditional type, in which the radiator is fed in the upper part, prove to be of particular interest. In such a case, the device comprises an hydraulic connection group suitable to maintain the communication between the water delivery pipe and the radiator during the rotation of the radiator itself and to ensure that the radiator works properly even if it is in a reclined position.

[0018] The invention will be now described in more detail with particular reference to the hereby attached drawings, provided as a non-limiting example, in which:

- Figure 1a is a perspective view of the anchoring device according to a first embodiment of the invention with the radiator in erect position;
- Figure 1b is a perspective view of the anchoring device of Figure 1a with the radiator in an inclined position;
- Figure 1c is a frontal view, partially in section, of the device of Figure 1a;
- Figures 1d and 1e are side views of the device of Figure 1a;
- Figure 2a is a frontal view of the anchoring device according to a second embodiment of the invention with the radiator in erect position;
- Figure 2b is a side view of the device of Figure 2a;
- Figure 3 is a frontal view of the anchoring device according to a third embodiment of the invention with the radiator in erect position.

[0019] With reference to Figures 1a-1e, the device according to the invention is applied to a radiator 1 of traditional type in which the delivery pipe 3 is placed high and the return pipe 5 is placed low.

[0020] With particular reference to Figure 1a, the device according to the invention is constituted by two support groups A, B for the lower base 1a of the radiator 1, one of said groups comprising hydraulic connection means with the return pipe 5 of said radiator 1. Moreover, said device comprises an anchoring group C, applied to the upper part of the radiator 1, that comprises control means for releasing said radiator from said anchoring and for allowing its rotation. Said device also comprises a hydraulic connection group D maintaining the radiator 1 connected with the delivery pipe 3 during the rotation of the radiator 1 and allowing that said radiator 1 works properly also when it is in a reclined position.

[0021] The support groups A, B comprise a pair of brackets 7 that are inserted into the wall to which the radiator 1 must be fixed. Said brackets 7 are fixed perpendicularly to said wall by means of bosses 99, preferably blocked by means of a chemical anchor, and are arranged at a reciprocal distance slightly greater than the width of the radiator 1.

[0022] Corresponding supports 9, on which the radiator an rest, are mounted on said brackets 7. In fact, the upper part of said supports 9 present a concave profile acting as a housing 11 for corresponding elements of the radiator 1.

[0023] The support group A arranged on the lower side 1c of the radiator 1, in which the return of the hydraulic circuit is not provided, receives in the housing 11 of the support 9 the external cylindrical portion 13 of the hexagon nut 15 that closes the most external element of the radiator 1 arranged at the same side, said element presenting a standardised thread.

[0024] The support group B arranged on the side 1d of the return pipe 5 receives in the housing 11 of the support 9 the connecting ring nut 17 arranged between the most external element of the radiator 1 and the holder 19 placed on the return pipe of the hydraulic circuit.

[0025] Advantageously, the lower part of the supports 9 presents an axial cylindrical recess 21 having a diameter slightly greater than the diameter of the brackets 7 so that it is possible to insert said supports 9 on said brackets 7 and make them slid thereon.

[0026] Said feature makes the mounting operations of the device easier because the supports 9 can be mounted on the brackets 7 after that said brackets 7 have been already fixed to the wall.

[0027] Besides, the distance between the supports 9 and the wall can be adjusted by making the supports 9 slid on the brackets 7. In fact, as it can be better seen in the Figures 1c and 1e, the lower part of the supports 9 presents a slot 23 parallel to the recess 21 allowing the passage of a screw 27 for blocking the support 9 against the bracket 7 in correspondence with a threaded hole 25 radially provided in the brackets 7.

[0028] By acting on said screw 27, it is possible to position the support 9 at the desired distance from the wall and to block it to the corresponding bracket 7. An anti-screwing washer 26 is arranged between the head of said screw 27 and the support 9 for ensuring that said support is safely blocked with respect to the bracket 7.

[0029] By referring back to the Figure 1a, the anchoring group C of the device according to the invention is applied on the side 1c, where the delivery 3 of the hydraulic circuit is not provided, in correspondence with the upper base 1b of the radiator 1.

[0030] Said anchoring group C comprises two elastic L-plates 29 fixed to the wall by means of corresponding fixing means 31 and bosses 101, said means 31 being preferably blocked by a chemical anchor. Said plates 29 are placed side by side so that the holes 33, present in the portion 32 perpendicular to the wall, are aligned.

[0031] A threaded bracket 35, perpendicular to the wall, is provided in correspondence with the means 31 for fixing the bracket 29 to the wall, said bracket 29 being arranged outside the radiator 1.

[0032] An internally threaded ring nut 37 is provided on the threaded bracket 35 so that said ring nut may be adjusted with continuity at a predetermined distance from the wall. A dowel arranged on the ring nut 37 allows then to fix said ring nut to the bracket 35. Advantageously, the ring nut 37 presents two portions 37a,37b having different tapers for facilitating the movements of engagement and release of the anchoring group C with respect to the bracket 35.

[0033] Control means 39 on the side wall 1c of the radiator 1 are provided for releasing the anchorage group C, thereby allowing to recline the radiator 1 by moving the upper base 1b away from the wall. Said means 39 are fixed to the radiator 1 by means of a ring nut 43 screwed onto the threaded shaft 42 of a nut 41 arranged at the end of the radiator 1 and made integral with the radiator itself on the standardised thread. Said means 39 comprise a support 45 made integral with the nut 41, and therefore with the radiator 1, by means of the ring nut 43, and a lever control 47 fixed to said stationary support 45 by means of a pin 49 that allows the oscillation of said lever control 47 in a plane parallel to the side wall of the radiator 1.

[0034] The lever control 47 presents a seat 51 that may engage with the ring nut 37 fixed on the cylindrical bracket 35 anchored to the wall. In this way, when the lever control 47 is engaged with the ring nut 37, the radiator 1 is maintained in vertical position.

[0035] As it can be better seen in Figure 1c, a helical spring 50 is associated to the pin 49, said spring maintaining the lever gear 47 in an engagement position with the ring nut 37.

[0036] As it is clearly shown in Figure 1b, in order to prevent that the radiator 1 can be excessively inclined with regard to the wall when the anchoring group C is released, it is provided a spring 53 that is respectively

connected to the plates 29 in correspondence with the holes 33 and to the radiator 1 in correspondence with the nut 41 by means of two cables 55.

[0037] When the radiator 1 is in vertical position, said spring stands in rest conditions and is tensioned when the radiator 1 is reclined.

[0038] Advantageously, the device according to the invention further provides a safety cable 81 intervening in case the spring 53 or one of the two cables 55 break. The safety cable 81 is of such a length that it can not be tensioned when the radiator is inclined and is sustained by the spring 53.

[0039] Besides, in order to prevent that the radiator 1 is unintentionally released from the anchoring in vertical position, especially in the presence of children, the device according to the invention provides for a screw with a knob head 57 engaging with the stationary support 45 and passing through a hole in the lever control 47, thereby preventing the rotation of the lever control 47 about the pin 49.

[0040] The hydraulic connection group D is provided on the opposite side 1d of the radiator 1, said group keeping into communication the radiator 1 with the delivery 3 of the hydraulic circuit.

[0041] Said group D is constituted by a pair of hollow connecting rods 59, 61 hinged between them thanks to the coupling of two respective rotating heads 63, 65. Moreover, the free end 67 of the first connecting rod 59 is rotatably connected with the radiator 1 by means of a ring nut 69 mounted on the most external element of the radiator 1 at the same side 1d, while the free end 71 of the second connecting rod 61 is rotatably mounted on a connecting element 73 that connects said second rod 61 with the pipe coming from the delivery tap 75.

[0042] All the connections of the heads of the connecting rods 59,61 between them and with the connecting elements 69,73 to the radiator and to the delivery are such to allow the relative rotation of the connected elements, still maintaining the passage for the fluid inside the hydraulic circuit.

[0043] When the radiator 1 is in vertical position, the two connecting rods 59,61 are aligned between them while they are made to diverge when the radiator 1 is reclined, so passing from the configuration of Figure 1a to that of Figure 1b.

[0044] As it can be seen in Figure 1c, said connecting rods 59, 61 are hollow and provide for an internal channel 77 for allowing the passage of the liquid coming from the hydraulic circuit of the heating system. The couplings of the connecting rods 59, 61 between them and with the connecting elements 69, 73 are made watertight thanks to the presence of a series of seals of the "O-ring" type.

[0045] For passing from the vertical configuration to the inclined one, the safety screw 57 is unloosed without getting unscrewed. Then the lever control 47 is made to oscillate upwards by manually acting on the trigger 48 and making it rotate about the pin 49, thereby overcoming the resistance of the spring 50 until the seat 51 is brought to a release position of the ring nut 37. The radiator 1 is not maintained in vertical position any more and can be reclined until it meets the resistance of the spring 53.

[0046] Advantageously, the presence of the spring 53 allows the oscillation of the radiator, thereby permitting to operate behind the radiator comfortably.

[0047] At the same time, on the opposite side 1d of the radiator 1, the rotating connections allows the bending of the joint formed by the two connecting rods 59, 61, thereby permitting to maintain the hydraulic continuity.

[0048] Advantageously, the length of said connecting rods 59,61 is such that, once the cables 55 are completely extended and the spring 53 is tensioned, they are not aligned yet. In this way, the tractive effort is concentrated on said spring 53 and does not weigh on the connecting rods 59, 61, so that whatever risk of breakage of the hydraulic connection is prevented.

[0049] While the radiator 1 is inclined, the cylindrical portion 13 of the nut 15 and the ring nut 17 are brought to rotate inside the housings 11 of the supports 9.

[0050] From this ensues a rotation movement of the radiator 1 about an axis passing through said housings 11 of the supports 9 and parallel to the floor and to the wall on which the radiator 1 is mounted.

[0051] Referring now to Figure 1c, it is shown in detail a section of the support group B provided on the side 1d of the radiator 1 in which the return hydraulic circuit 5 is present. Said support group B allows the rotation of the lower base 1a of the radiator 1 with respect to the pipe 83 coming from the holder 19, so that it is possible to recline the radiator 1 without being it necessary to disconnect the pipes of the hydraulic circuit.

[0052] As it has already said, a ring nut 17, resting on the housing 11 of the support 9, is mounted on the side wall 1d of the radiator 1 in correspondence with the threaded outlet sleeve 87 of the radiator 1.

[0053] A shaft 89 with an axial hole 90 is provided between the ring nut 17 and the inlet tube 83 in the holder 19. Said shaft 89 is made integral with the input portion 95 of the pipe 83 by means of a ring nut 93 and rotates with respect to the ring nut 17. A pair of dowel screws 91 is radially provided in said ring nut 17 for preventing that the shaft 89 gets unthreaded from the ring nut 17 and a pair of O-rings 97 is provided between said shaft 89 and the ring nut 17.

[0054] Referring now to the Figures 2a-2b, it is shown a second embodiment of the device according to the invention, suitable for radiators of traditional type.

[0055] This embodiment differentiates from the previous one for the structure of the hydraulic connection group D. The support groups A, B and the anchoring group C are identical to those already shown and described.

[0056] In this embodiment the hydraulic connection group D to the delivery 3 provides for a flexible pipe 103

instead of an articulated joint formed by two connecting rods. The ends of said flexible pipe 103 are connected, by means of pipe fittings 105, with two joints 107, 109 rotatably fixed respectively on the ring nut 69 of the most external element of the radiator 1 and on the fitting 73 with the pipe 79 coming from the delivery tap 75.

[0057] Similarly to what is provided for the pair of connecting rods 59, 61 described in the first embodiment, the length of the flexible pipe 103 is greater than that of the elastic group constituted by the spring 53 and by the two cables 55 and is greater than the length of the safety cable 81, so that said pipe is not subjected to traction when the radiator 1 is in a reclined position.

[0058] It is clear that the device according to the invention can be easily applied to radiators of new generation that present delivery and return aligned at the same height in correspondence with the lower base of the radiator 1.

[0059] Figure 3 shows precisely a third embodiment of the device according to the invention, applicable to said type of radiators.

[0060] In this embodiment the support group B and the anchoring group C are identical to those of the previous embodiments while the connecting group D is absent.

[0061] The support group A differentiates from that of the previous embodiments and is substantially identical to the support group B.

[0062] According to this embodiment, the support group A provides for a ring nut 17 mounted on the side wall of the radiator 1 for rotatably holding a shaft 89 provided with a through hole 90 and fixed by means of a ring nut 93 to the end opposite to the fitting 95 of the delivery tap 75 of the hydraulic circuit.

[0063] Therefore the device according to the invention meets the predetermined objects of the invention, as it can be applied both to already existing systems of traditional type and to new systems, and it allows to recline the radiator by means of rapid and easily operable control means.

Claims

1. Device for anchoring a heating radiator (1) to a wall, said device comprising:

   - a pair of support groups (A, B) for the lower base of the radiator, said groups being fixed to the wall on which the radiator (1) has to be mounted, said lower base (1a) of said radiator (1) being free to rotate about said groups;
   - an anchoring group (C) for removably anchoring the upper base (1b) of the radiator (1) to the wall,

   characterised in that said support groups (A, B) and said anchoring group (C) are arranged at the sides of said radiator.

2. Anchoring device according to claim 1, **characterised by** the fact of further comprising a hydraulic connection group (D) arranged laterally to said radiator (1) and in correspondence with the upper base (1b), said connection group (D) allowing the rotation of the radiator (1) with respect to said support groups (A, B) maintaining the connection with the hydraulic circuit.

3. Anchoring device according to claim 2, **characterised in that** said connection group (D) comprises a pair of hollow connecting rods (59, 61) hinged between them and rotatably coupled respectively to the body of the radiator (1) and to the hydraulic circuit in which said radiator (1) is inserted.

4. Anchoring device according to claim 2, **characterised in that** said connection group (D) comprises a flexible pipe (103), the ends of said flexible pipe (103) being connected by means of threaded fittings (105) with two joints (107, 109) rotatably fixed respectively to the body of the radiator (1) and to the hydraulic circuit in which said radiator (1) is inserted.

5. Anchoring device according to claim 1, **characterised in that** said support groups (A, B) comprise a pair of supports (9) that can slide on corresponding brackets (7) fixed to the wall so that the distance between said supports (9) and said wall can be varied.

6. Anchoring device according to claim 1, **characterised in that** said anchoring group comprises an oscillating lever control (47) fixed to said radiator (1) by means of a support (45) and a ring nut (37) fixed by means of a bracket (35) to the wall, said ring nut (37) being arranged substantially perpendicular with respect to said lever control (47) and said lever control (47) being able to oscillate between a position of engagement with said ring nut (37), corresponding to the vertical configuration of said radiator, and a release position corresponding to the configuration in which said radiator (1) can be inclined with respect to said wall.

7. Device according to claim 6, **characterised in that** said lever control (47) comprises a seat (51) into which said ring nut (37) is received when said anchoring group (39) is in the engagement configuration.

8. Anchoring device according to claim 1, **characterised in that** it further comprises safety means (53, 55, 81) for limiting the angle of inclination of said radiator (1).

9. Anchoring device according to claim 8, **characterised in that** said safety means comprise a first elastic tie rod (53, 55) and a second substantially inextensible tie rod (81), said first and second tie rods presenting their ends respectively fixed to the wall and to the radiator (1).

10. Anchoring device according to claim 1, **characterised in that** said support groups (A, B) and said anchoring group (C) are made integral with the radiator (1) in correspondence with external elements of the radiator having a standardised thread.

11. Anchoring device according to claim 6, **characterised in that** said bracket (35) is externally threaded and said ring nut (37) is internally threaded for allowing the positioning of said ring nut on said bracket at a predetermined distance from the wall.

12. Anchoring device according to claim 7, **characterised in that** said ring nut (37) presents two portions (37a, 37b) having different tapers for facilitating the engagement and/or the release of said support (45) from said seat (37).

13. Heating radiator (1), **characterised in that** it comprises an anchoring device as claimed in any one of the preceding claims.

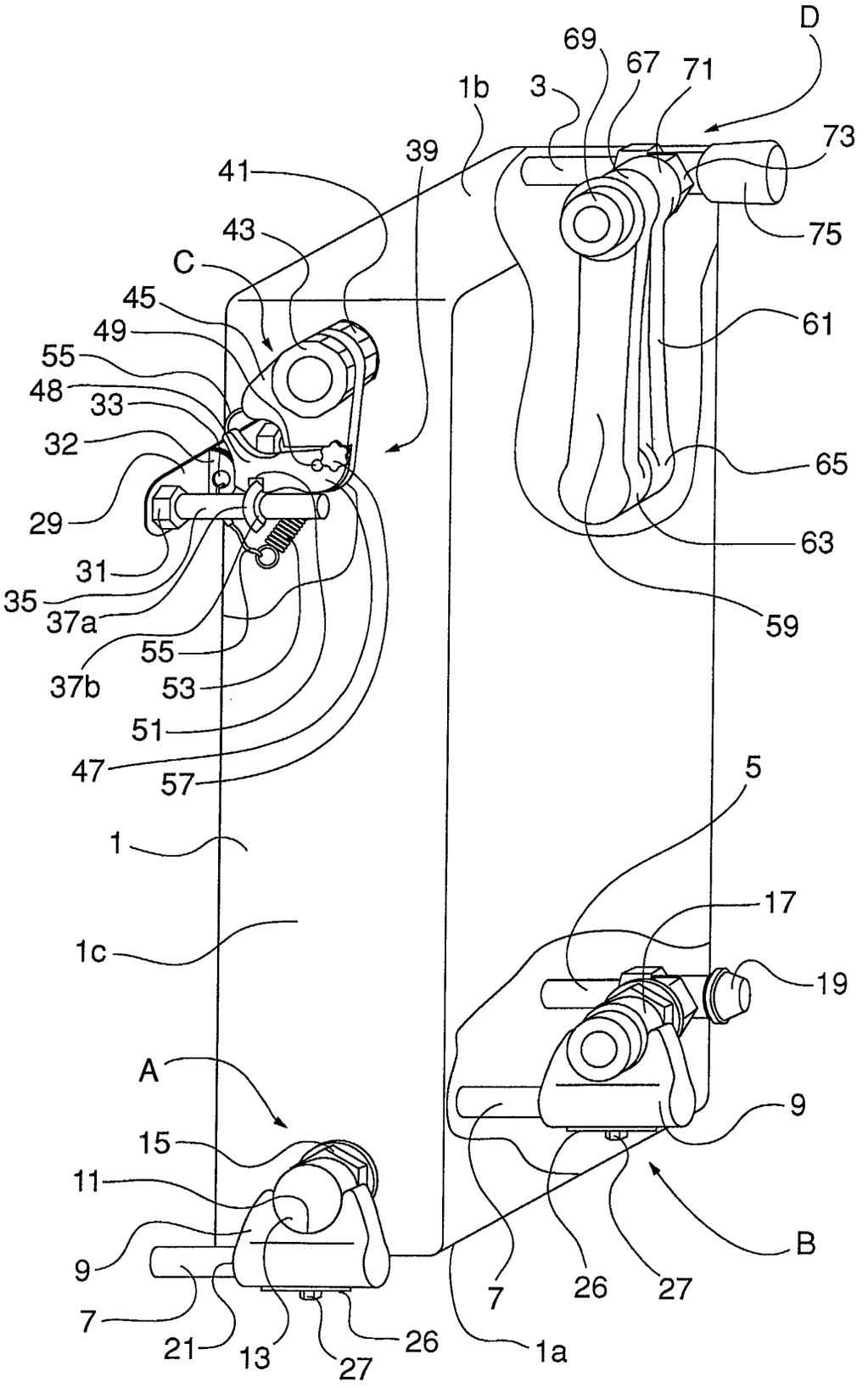
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Fig. 1a

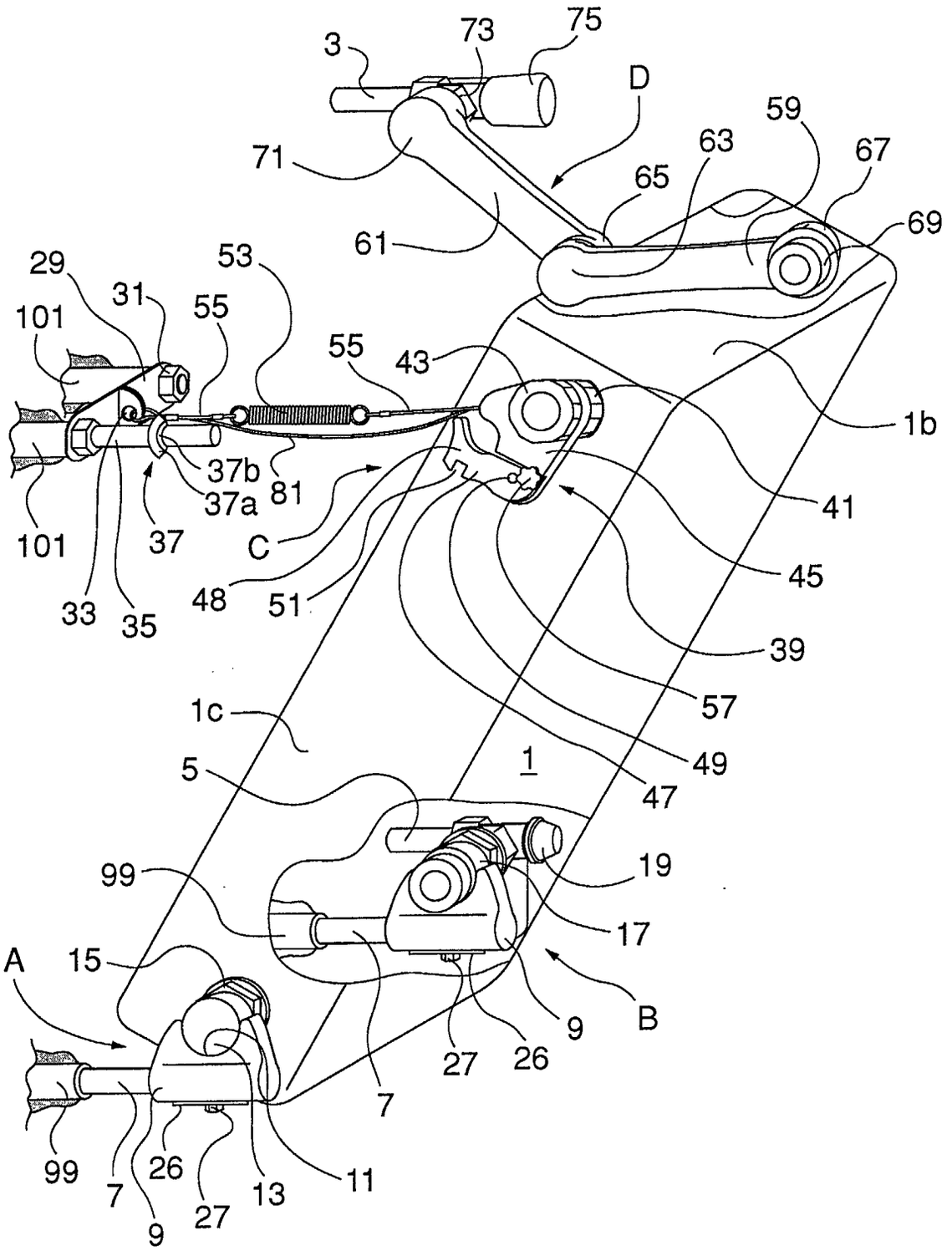
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Fig. 1b

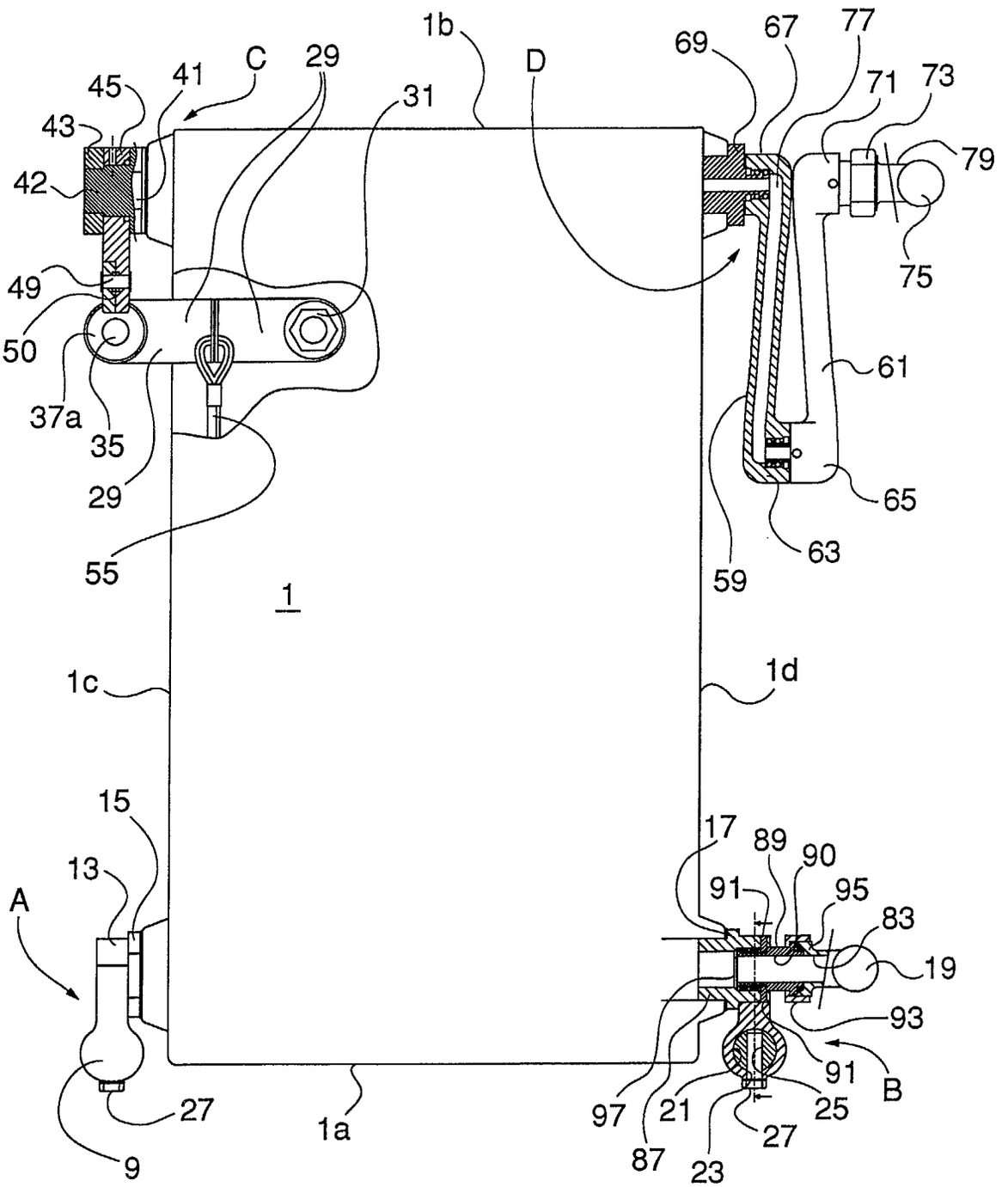
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Fig. 1c

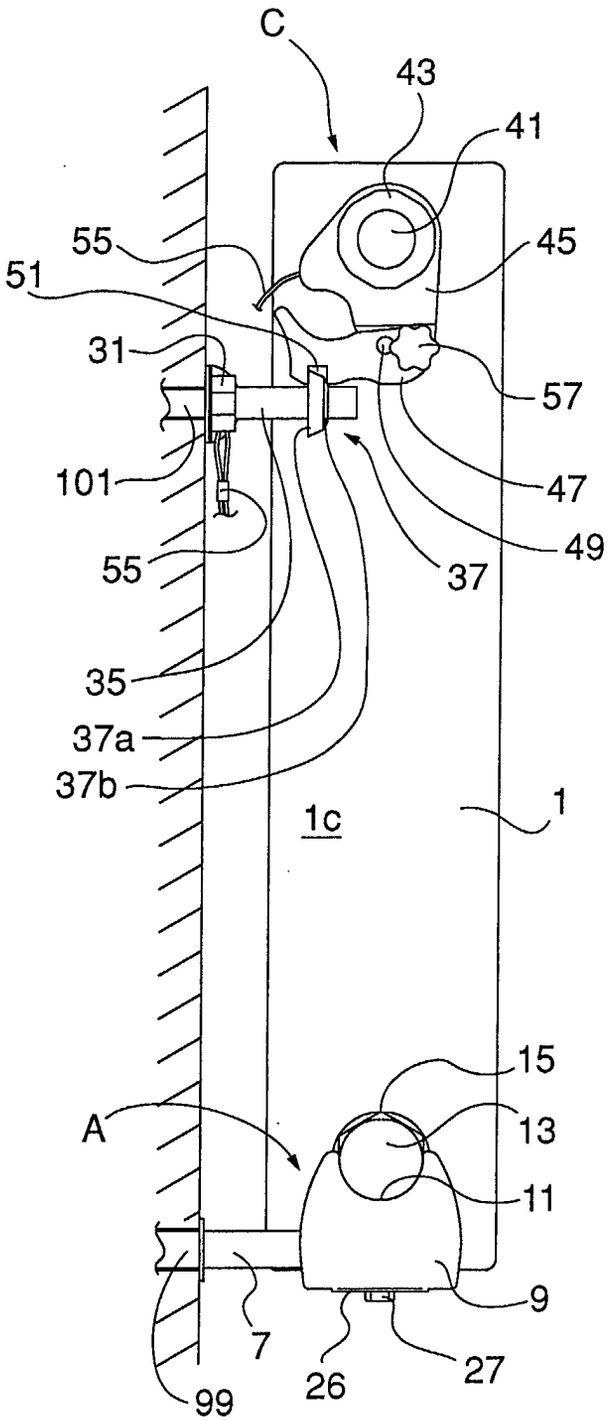
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Fig. 1d

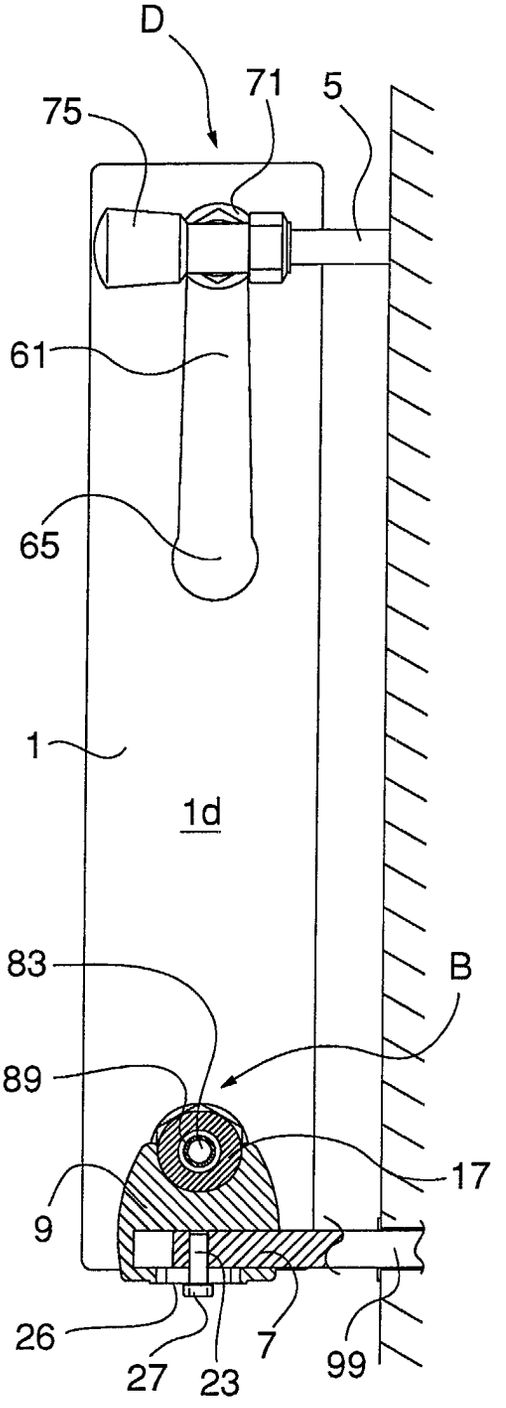
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Fig. 1e

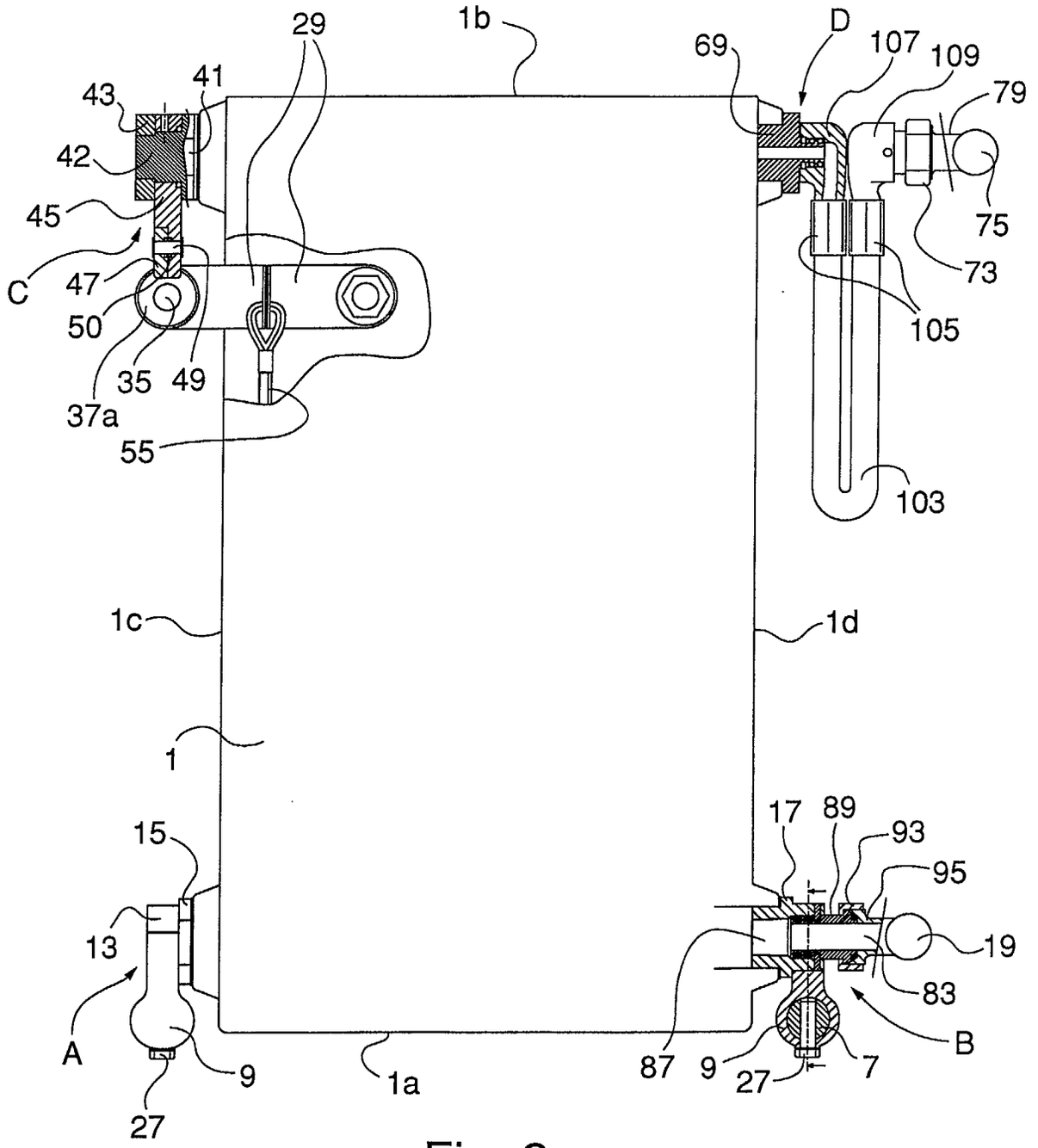
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Fig. 2a

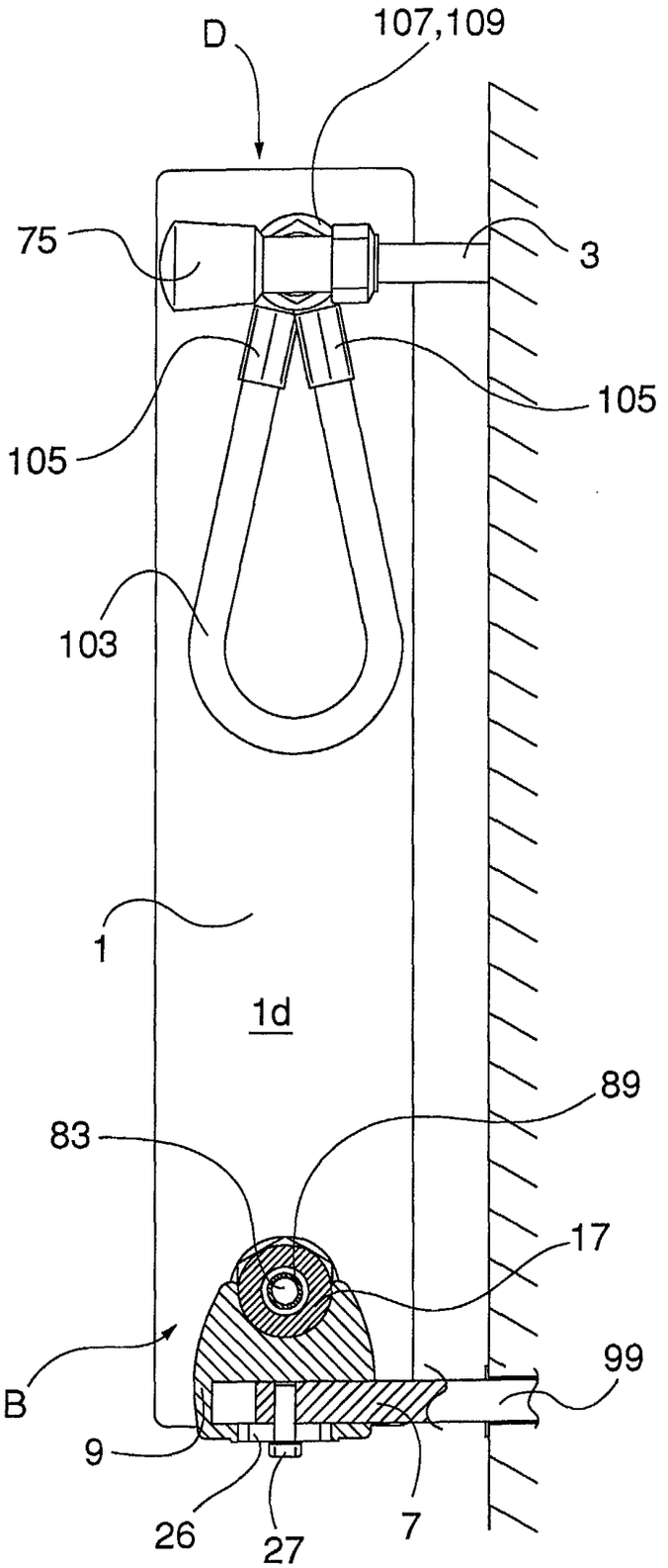

Fig. 2b

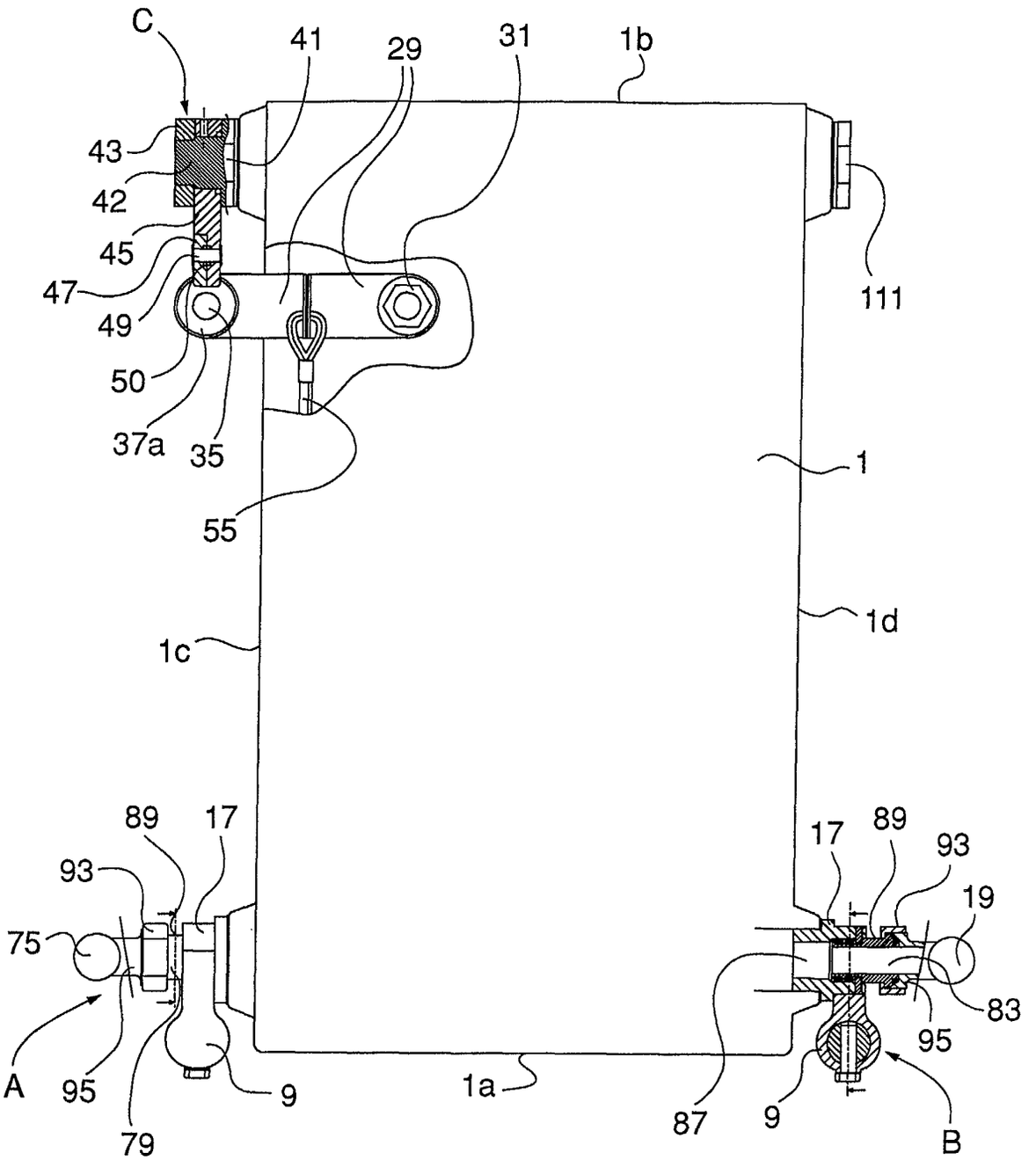
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Fig. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5476

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X Y	DE 101 55 402 A (SLG PRUEF UND ZERTIFIZIERUNGS) 2 May 2002 (2002-05-02) * the whole document * ---	1,10,13 2	F24D19/02
Y	FR 2 486 194 A (POLYVENTIONS SUISSE SA) 8 January 1982 (1982-01-08) * figure 3 * ---	2	
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X A	DE 196 33 144 A (KERMI GMBH) 19 February 1998 (1998-02-19) * column 6, line 62 - column 7, line 32 * * column 8, line 26-34; figures 1,2 * ---	1 4	
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)
F24D F24H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	9 January 2003	Leclaire, T

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