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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *of inventorship (Rule 4.17(iv))*

[Continued on next page]

(54) Title: CONTROLLING A HEATING/COOLING SYSTEM

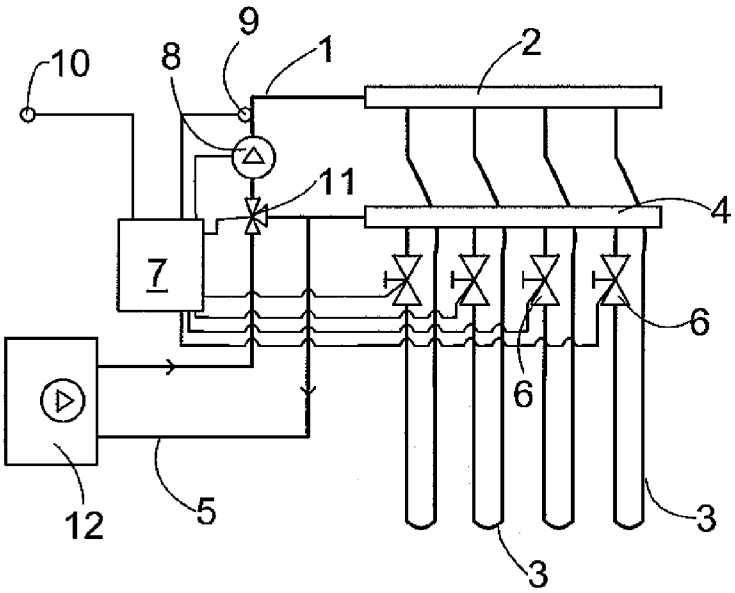

FIG. 1

(57) Abstract: The invention relates to a hydronic heating/cooling system. In the system, liquid is led along a main supply pipe (1) to a supply manifold (2) and distributed in the manifold into heating loops (3). The heating loops (3) return to return manifold (4). At least one of the manifolds (2, 4) has actuators (6) for controlling the flow in the heating loops (3). At least one loop is designated to be a bypass loop. The actuators (6) in the loops (3) are monitored and it is ensured that the actuator (6) of the bypass loop is open if all the other actuators (6) are closed.

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B. FIELDS SEARCHED

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

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 10 2006 052124 A1 (DANFOSS AS [DK]) 15 May 2008 (2008-05-15) pages 5-7; figures 1-4 -----	1-11
A	DE 37 08 449 A1 (BECHEM & POST GMBH & CO KG [DE]) 29 September 1988 (1988-09-29) the whole document -----	1-11
A	DE 41 24 304 A1 (HEIMEIER GMBH METALL THEODOR [DE]) 28 January 1993 (1993-01-28) columns 4-5; figure 1 -----	1-11
A	EP 1 033 539 A2 (CASTELLETTI LUIGI [IT]) 6 September 2000 (2000-09-06) columns 2-4; figure 1 -----	1-11
A	EP 0 548 389 A1 (FIEDRICH JOACHIM [US]) 30 June 1993 (1993-06-30) columns 8-18; figures 1-5 -----	1-11

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102006052124 A1	15-05-2008	DE 102006052124 A1	15-05-2008
		EP 2087291 A1	12-08-2009
		WO 2008055498 A1	15-05-2008
DE 3708449 A1	29-09-1988	NONE	
DE 4124304 A1	28-01-1993	NONE	
EP 1033539 A2	06-09-2000	AT 324559 T	15-05-2006
		DE 60027497 T2	07-09-2006
		EP 1033539 A2	06-09-2000
		ES 2259582 T3	16-10-2006
		IT VR990023 A1	04-09-2000
EP 0548389 A1	30-06-1993	AT 156582 T	15-08-1997
		DE 69127203 D1	11-09-1997
		DE 69127203 T2	26-02-1998
		EP 0548389 A1	30-06-1993