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Remarks:
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(54) A block manifold for heat exchanger batteries fan coils

(57) The invention concerns a block manifold for fan coil battery heat exchangers having a one piece body defining an intermediate distribution chamber (14) perfectly closed around outside, a fitting (12) with fluid piping for connection to the heat exchanger battery, one, two or more branches (13)), in which all the parts of the manifold are oriented in parallel to each other in the same direction, so that the manufacturing of the block is greatly enhanced.

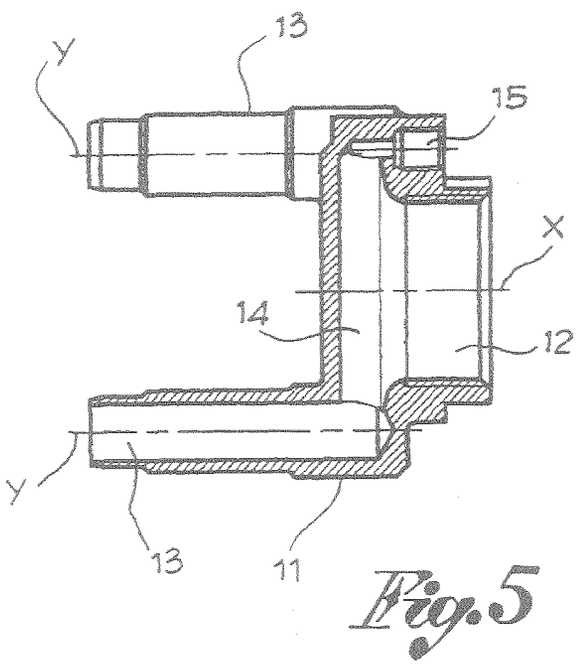

Fig. 5

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Description

[0001] This invention concerns a block manifold for fitting to heat exchanger batteries and especially for fan coils.

[0002] In fan coils the heat exchanger batteries have fluid circulation pipes the ends of which are connected to manifolds through which the fluid flow and return pipes are connected. Usually the manifolds have a block body with a part fitting to fluid piping, two, three or more branches for connection to the battery pipes and a distribution chamber between the fitting and the said branches. Generally, this cylinder is cylindrical and its geometric axis is oriented transversally to the axes of the fitting and the branches which are substantially parallel to each other.

[0003] By its presence and conformation, this chamber is already a cause of turbulence in the fluid and a loss of pressure in the system and contributes to pointlessly increasing the external dimensions of the manifold.

[0004] Moreover, due to shape and machining requirements inside the body, this intermediate cylindrical chamber is left open at one end and is only closed, with a plug, generally welded on, at the end of machining. This plug represents a critical part of the manifold.

[0005] At the same time, inserting and fixing this plug requires additional production work time and costs. Furthermore, if the welding is not homogenous it becomes a source of rejection because in this case the manifold cannot be used.

[0006] Block manifolds are known in the state of the art, as shown by documents EP-A-0758734, US 4,948,177, US 1,092,385, US 1,160,839, US 1,205,508, US 2,673,101, US 5,176,177, US 3,951,440, US 5,078,432, US 5,143,151, US 5,908,288, GB 10174, GB 897965, US 3,790,966, US 4,013,049, US 4,541,448, US 6,202,686 and US 6,237,408.

[0007] Starting from this introduction, the purpose of this invention is to create and supply a manifold for heat exchanger batteries which is new and original in conformation, capable of providing diverse advantages over manifolds of known technical merit in construction, economical and functional terms.

[0008] This aim has been reached by a manifold for the use cited above which includes a block body: here, the distribution chamber, located between the fitting and branch parts is coaxial to the fitting and on a parallel axis to the said branches.

[0009] In other words, all the parts of the manifold are oriented in parallel to each other in the same direction. This allows a reduction in the external dimensions of the body, while maintaining the technical characteristics required for its use and a reduction in the raw materials used to make it. Furthermore, the internal machining of the body to provide communication between the fitting and the branches can be performed by passing axially from the fitting without the need for lateral openings. The insertion and welding of a plug is thus eliminated and consequently also the risk of rejects and some production costs. Also, and not least, the intermediate chamber with its axis parallel to the fitting and the branches contributes to reducing if not completely eliminating, the turbulence in the fluid and the pressure losses in the supplied system.

[0010] The drawings enclosed illustrate an example of how the manifold is created, which is described in more detail as follows:

[0011] - figure 1 shows a perspective view;

[0012] - figure 2 shows a side view;

[0013] - figure 3 shows an end view of the fitting side;

[0014] - figure 4 shows a side view of the branches;

[0015] - figure 5 shows a section according to the V-V arrows in Fig. 3; and

[0016] - figure 6 shows a cross-section of a part of the body according to the VI-VI arrows in Fig. 3.

[0017] The manifold is comprised of a block body, usually made of brass. The resulting body is obtained with normal forming techniques and then machined for the finish required.

[0018] This body, when finished, has a fitting 12 with an internal thread on one end and two, three or more branches on the opposite end 13; inside there is a distribution chamber 14 which connects the fitting 12 and the branches 13.

[0019] A distribution chamber is a chamber in which the fluid passing through can be distributed between any branch of said branches 13. In other words, a distribution chamber is a chamber in which the fluid passing through can be shared with the branches.

[0020] The fitting 12 has a geometric axis X; the branches 13 are in parallel Y axes to the X axis of the union part.

[0021] As regards the internal chamber 14, this is circular and completely closed all round, coaxial with the fitting and with a radius broad enough to intersect the branches. All this to achieve the purpose and advantages described above.

[0022] In the body, on the sides of the fitting 12 seats for plug pins 15 have been made.

[0023] It is anyway evident that all the machining on the body and especially on the intermediate chamber can be performed on the same line or in parallel to the axis of the fitting, greatly simplifying the machining process.

Claims

1. A block manifold for fan coil battery heat exchangers, comprising

   - a one piece body defining an intermediate distribution chamber (14) perfectly closed around outside, with a portion having a circular cross section, said circular cross section having a

chamber axis (X-X),

- said body having first and second ends on opposite axial ends of said chamber, said block body comprising
- a fitting (12) with fluid piping for connection to the heat exchanger battery, coaxial with the intermediate chamber (14), formed at said first end of the block body and in communication with the intermediate chamber;
- one, two or more branches (13) formed at said second end of the block body, said branches being directly in communication with said intermediate chamber and each of said branch having a straight branch axis (Y-Y);

said block being **characterized by** the fact that each of said branch axis (Y-Y) is parallel to said chamber axis (X-X).

2. A block according to claim 1, in which said fitting comprises an hexagonal wrench interface for mechanically engaging a tool.

3. A block according to claim 1 or 2, in which said fitting comprising an internally thread portion.

4. A block according to claim 2 and 3, in which said thread portion is the internal portion of the hexagonal wrench interface.

5. A block according to any one of the preceding claims, in which said branches have a distal portion with a circular outer form.

6. A block according to any one of the preceding claims, in which said branches ends with a portion having an outer diameter smaller than that of the remaining portion.

7. A block according to any one of the preceding claims, in which there are three or more branches, the branch axes (Y-Y) of two branches (13) defining a geometrical plane and the branch axis (Y-Y) of the remaining branch (13) being outer of said geometrical plane.

8. A block according to claim 7, in which said branch axis of said remaining branch (13) is between the branch axes of said two branches.

9. A block according to claim 8, in which said branch axis of said remaining branch (13) is equally distal from the branch axes of said two branches.

10. A block according to any one of the preceding claims, in which said body is made of brass.

11. A block according to any one of the preceding claims, in which the portion of said intermediate chamber with which said branches directly communicate is undercut with respect to an aperture to the outside of the fitting.

12. A block according to any one of the preceding claims, in which said branches have a constant inner diameter.

13. A block according to any one of the preceding claims, comprising seats (15) for plug pins (16), in which said seats (15) are in communication with said intermediate chamber (14).

14. A block according to claim 13, in which said seats have a straight axis.

15. A block according to claim 14, in which said straight axis is parallel to said chamber axis (X-X).

16. A block according to any one of claims 13 to 15, in which said seats are formed at said first end of the block body.

17. A block according to claim 16, in which said seats are formed at diametrically opposed positions with respect said circular portion of said intermediate chamber.

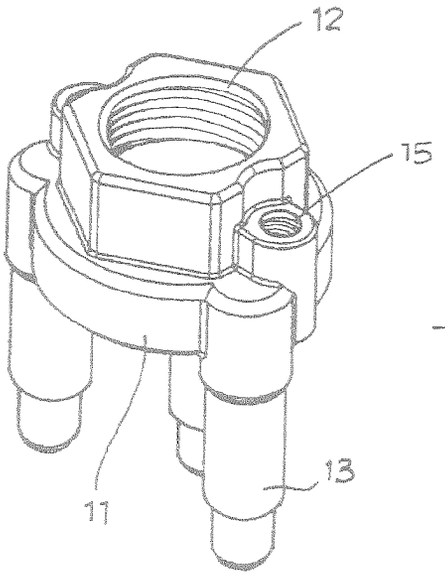

Fig.1

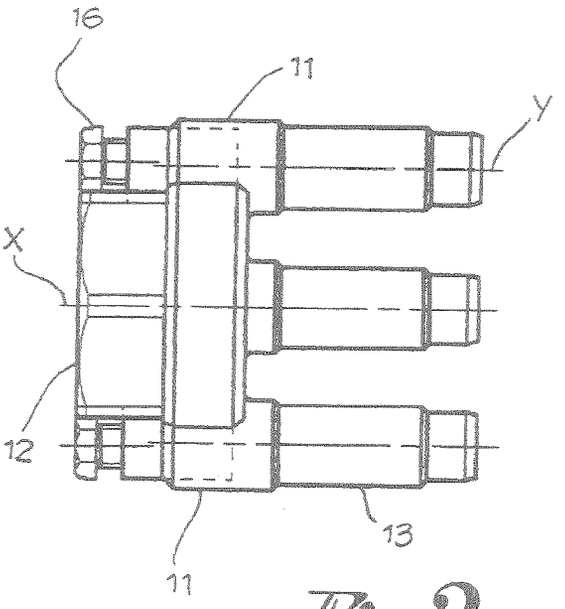

Fig.2

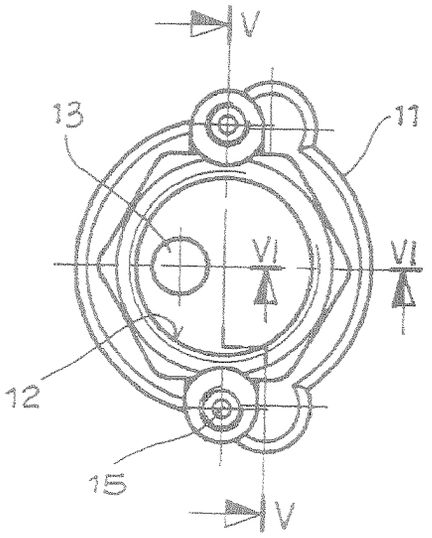

Fig.3

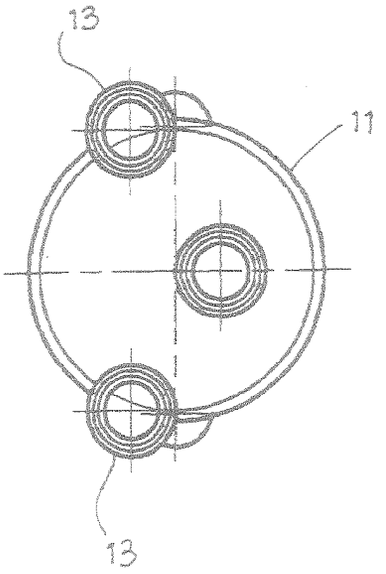

Fig.4

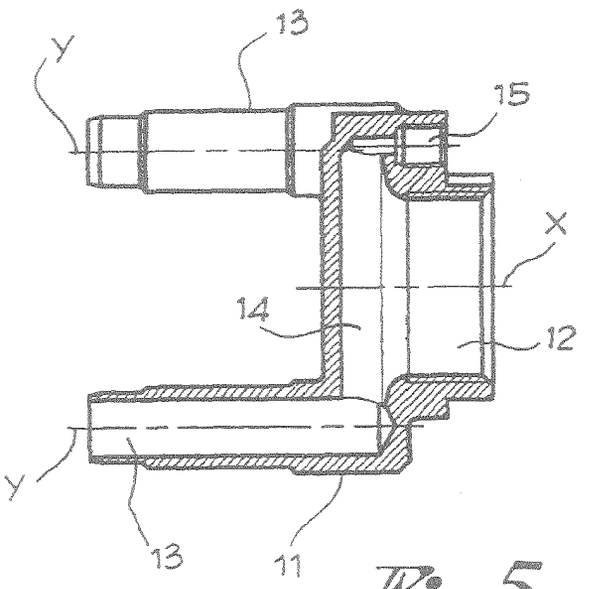

Fig.5

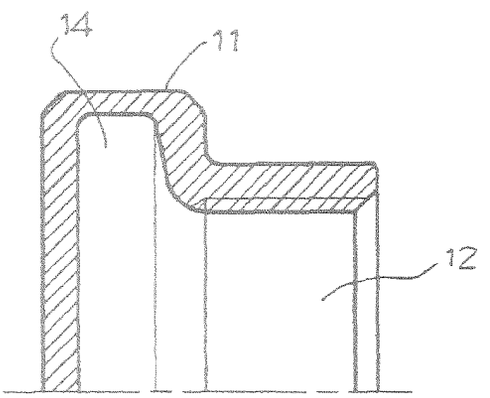

Fig.6