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(54) **COOLING FIN**

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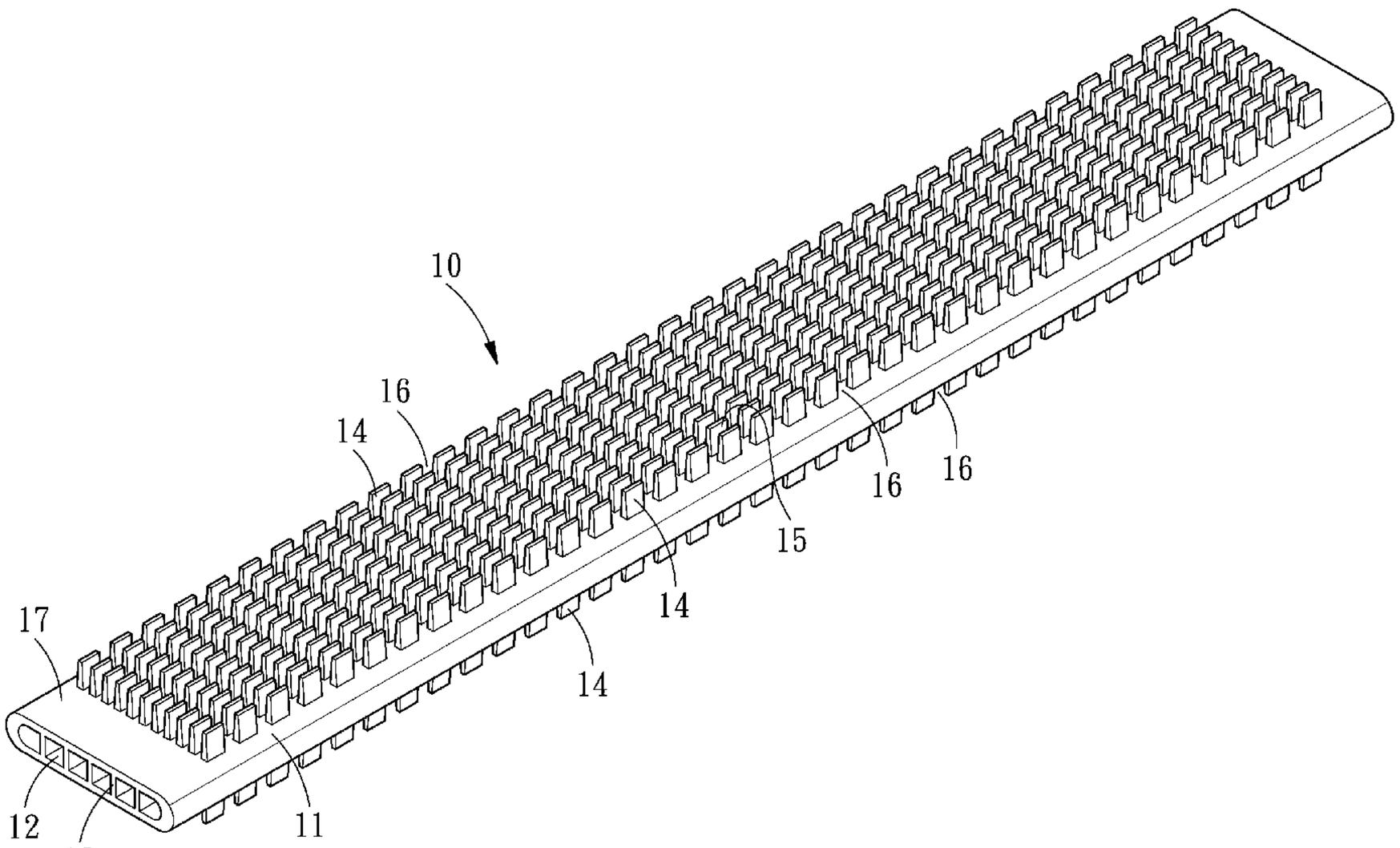
(57) **ABSTRACT**

A cooling fin is integrally formed and comprises a board body, a passage penetrating the board body, and plural heat dissipating portions located outside the board body in the direction along the passage. Between each two neighboring portions is defined a heat dissipating space. By such arrangements, the cooling fin has the advantages such as better heat dissipation effect, easy to assemble and simple structure without any assembling operations and procedures.



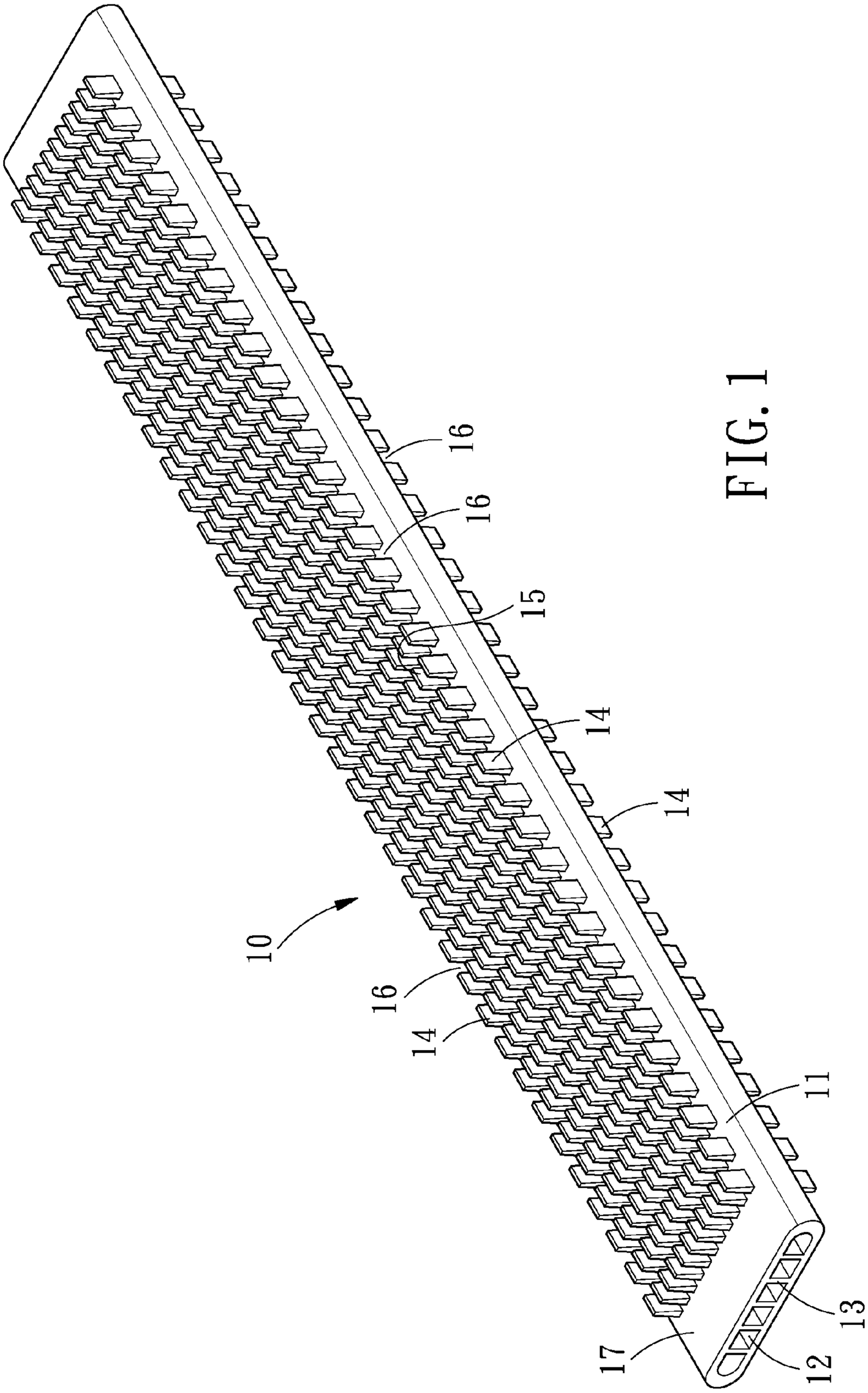


FIG. 1

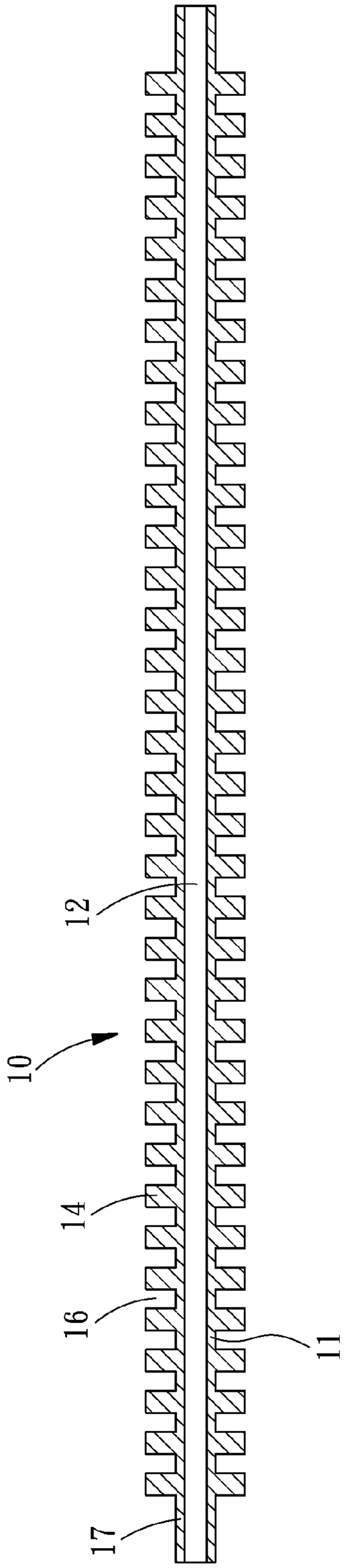


FIG. 2

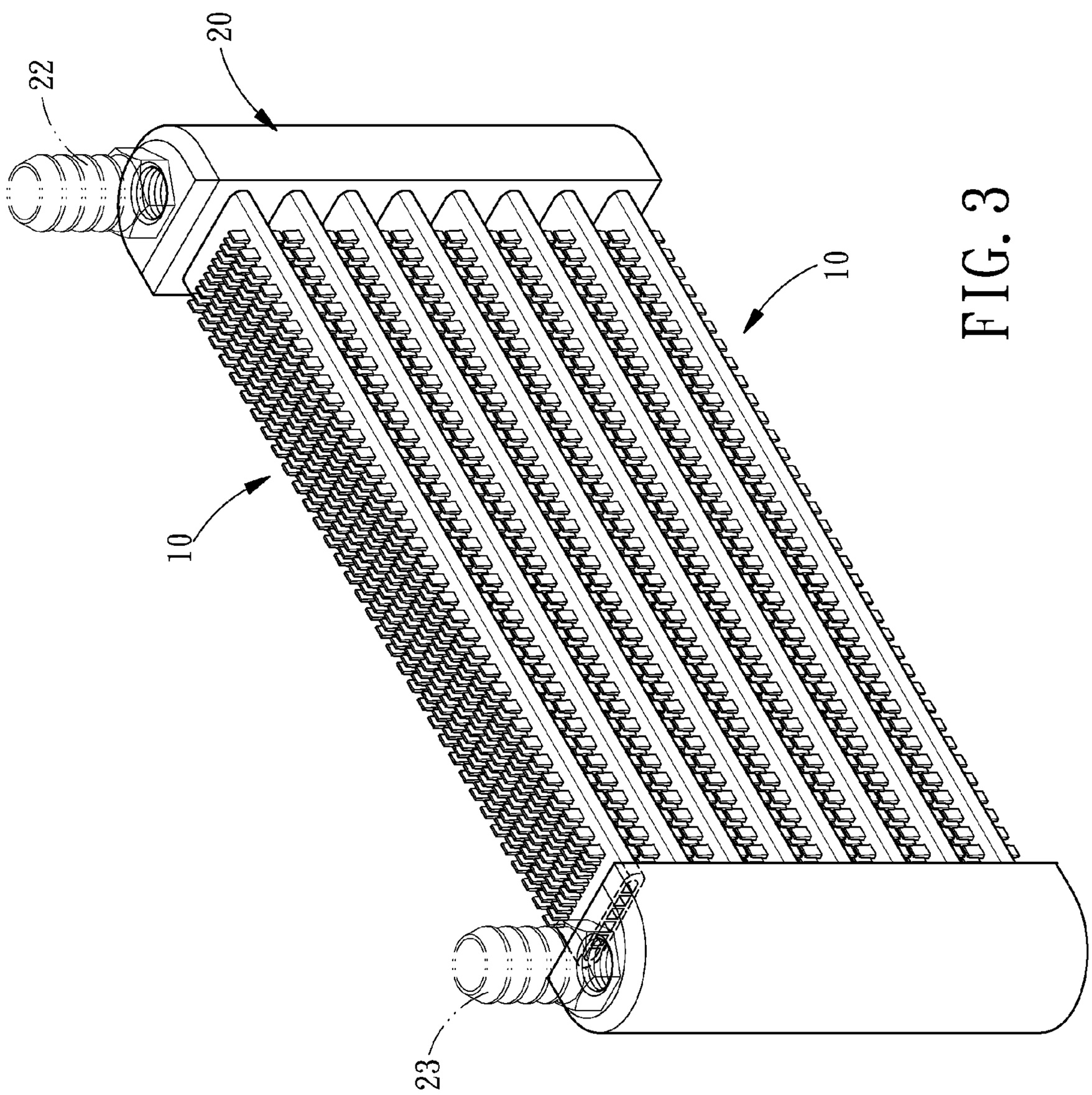


FIG. 3

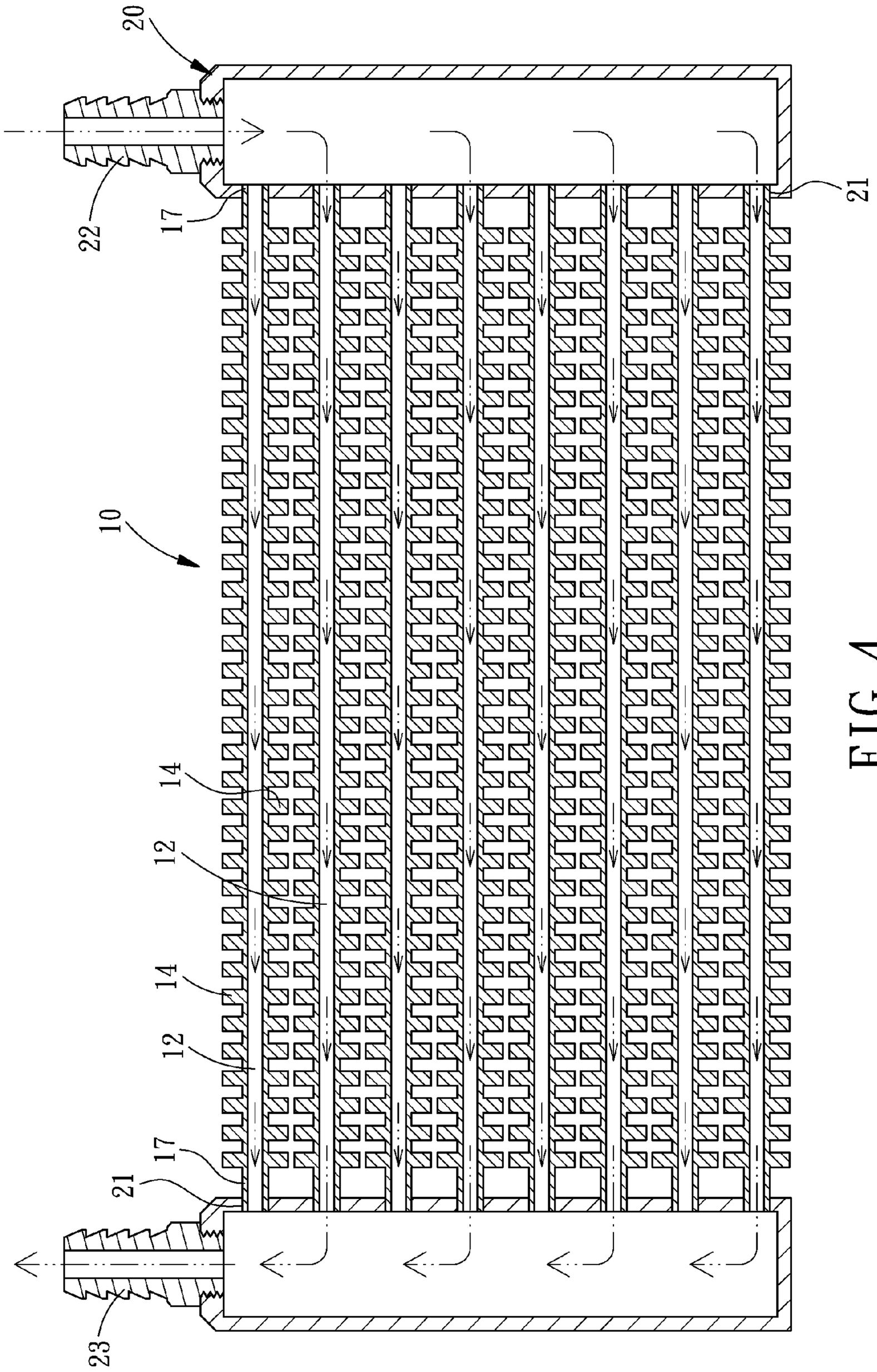


FIG. 4

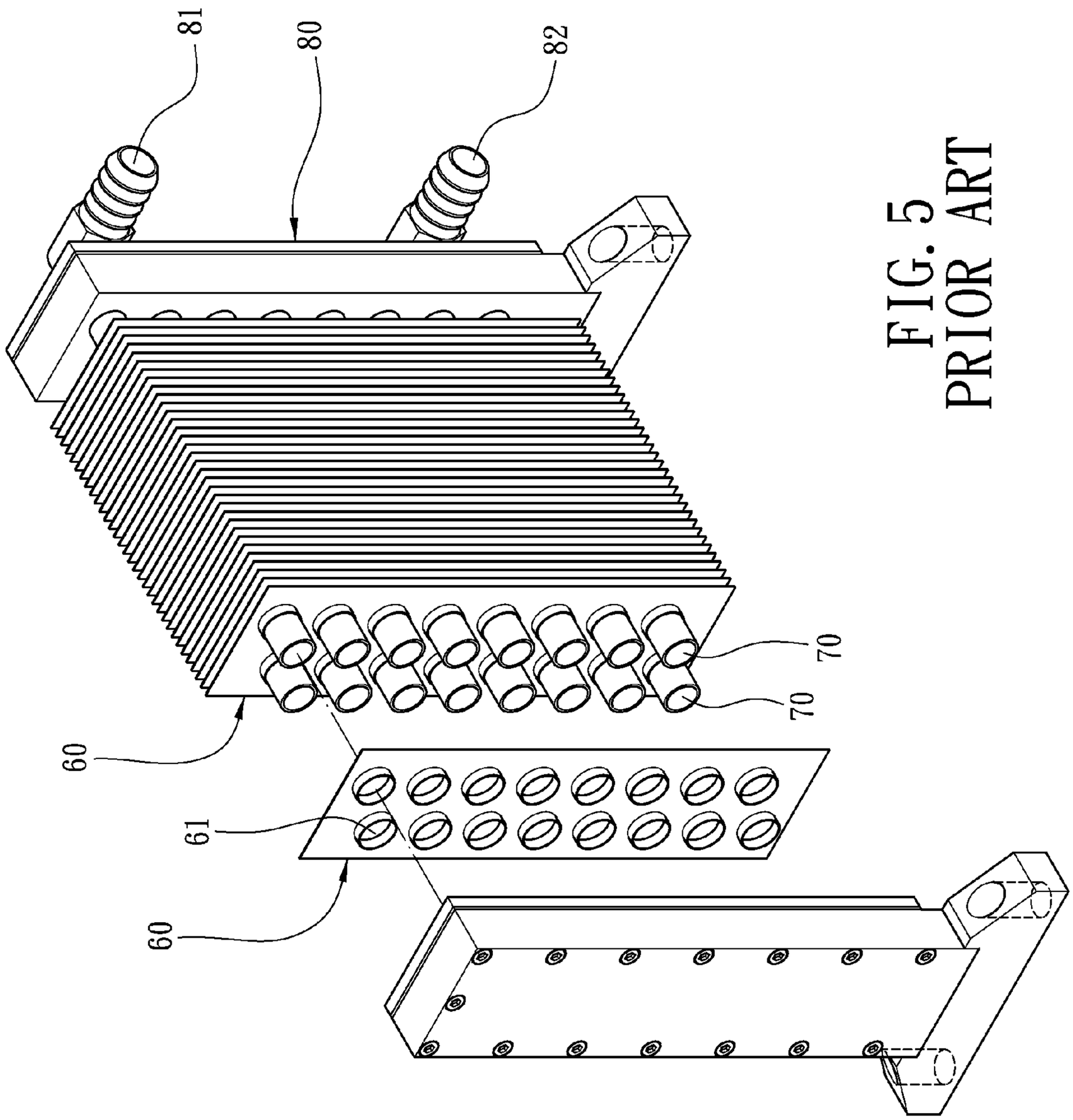


FIG. 5
PRIOR ART

COOLING FIN

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a cooling fin structure for mechanical equipments, which can solve the high temperature problem caused during the running process by cooperating with liquid to absorb the heat quickly to reduce the temperature.

[0003] 2. Description of the Prior Art

[0004] Most of equipments, such as cars or motobicycles, are likely to generate heat during running process, which will cause high temperature and damage the inner components of the equipments, thus leading to the unsmooth operation. In order to ensure smooth operation of the equipments, a cooling fin structure capable of dissipating heat quickly was developed on the market. As shown in FIG. **5**, a common conventional cooling fin structure comprises plural cooling fins **60**, plural liquid pipes **70** and a liquid base assembly **80**. The respective cooling fins **60** are sheet-shaped members formed by stamping and punched to have plural through holes **61** in a surface thereof. The respective liquid pipes **70** are fitted in the through holes **61**. The liquid base assembly **80** is provided for mounting the respective liquid pipes **70** and includes an inlet **81** and an outlet **82**.

[0005] By such arrangements, after the respective cooling fins **60** are parallely spacedly assembled, the liquid pipes **70** will penetrate the respective through holes **61** and then fixed therein by means of adhesive, heat sink paste or welding. Next, the liquid base assembly **80** will be combined to both ends of the respective liquid pipes **70** in such a manner that gas or liquid can flow in and out of the respective liquid pipes **70** through the inlet **81** and the outlet **82**, respectively. When the gas or the liquid flows through the respective cooling fins **60**, the heat in the gas or the liquid can be absorbed by the respective cooling fins **60** and then dissipated into the air to cool down the gas or the liquid that flows through the respective liquid pipes **70**.

[0006] The above conventional structure suffers from the following disadvantages: since the cooling fins **60** are independent from the liquid pipes **70**, there must be a clearance between the respective cooling fins **60** and the respective liquid pipes **70**, thus causing poor heat conductivity, in addition, in order to improve the poor heat conductivity caused by the clearance, after penetrating the through holes **61** of the cooling fins **60**, the respective liquid pipes **70** must be bonded to the respective cooling fins **60** by means of adhesive, heat sink paste or welding, so that it can be found that the conventional structure is complicated in assembly and has various components, furthermore, even through the cooling fins **60** are bonded to the liquid pipes **70** by means of adhesive, heat sink paste or welding, they are still independent from each other and unable to exert the optimal cooling effect.

[0007] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY OF THE INVENTION

[0008] The technical problems to be solved:

[0009] As for the conventional cooling fin structure, since the heat sinks and the liquid pipes are independent form each other, the heat conductivity is poor, and since the heat sinks are bonded to the respective liquid pipes by means of adhesive, heat sink paste or welding, the conventional cooling fin further has the disadvantages of complicated in assembly and various components.

[0010] In order to solve the above technical problems, a cooling fin in accordance with the present invention is integrally formed and comprises a board body, a passage penetrating the board body and plural heat dissipating portions located outside the board body in the direction along the passage. Between each two neighboring heat dissipating portions is defined a heat dissipating space.

[0011] As compared to the conventional cooling fin structure, the cooling fin of the present invention has the following advantages:

[0012] The primary objective of the present invention is to provide a cooling fin, since the cooling fin is integrally formed and all the structures are integrally connected, so that the cooling fin in accordance with the present invention has the advantages such as better heat dissipation effect, without any assembling operations and procedures, easy to assemble and simple structure.

[0013] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiments in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1** is a perspective view of a cooling fin in accordance with the present invention;

[0015] FIG. **2** is a side cross-sectional view of the cooling fin in accordance with the present invention;

[0016] FIG. **3** is a perspective assembly view illustrating an operating state of the cooling fin in accordance with the present invention;

[0017] FIG. **4** is a cross-sectional view illustrating how a liquid flows through the cooling fin in accordance with the present invention; and

[0018] FIG. **5** is an exploded view of a conventional cooling fin.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] Referring to FIGS. **1-2**, a cooling fin **10** in accordance with a preferred embodiment of the present invention is integrally formed by aluminum extruding. The cooling fin **10** comprises a board body **11**, and a passage **12** penetrating the board body **11**. The passage **12** is divided into at least two equal parts by at least one division plate **13**. When being provided with three division plates **13**, the passage **12** will be divided into four equal parts. In addition, the cooling fin **10** is further provided with plural heat dissipating portions **14** outside the board body **11** in a direction along the passage **12**. Between each two neighboring heat dissipating portions **14** is defined a heat dissipating space **15**. The respective heat dissipating portions **14** are defined with plural vertical notches **16** to increase the surface area thereof. The board body **11** of the cooling fin **10** is further provided with an assembling segment **17** at each of two opposite ends thereof in the direction along the passage **12**.

[0020] As shown in FIG. **3**, which illustrates an operation method of the cooling fin **10** of the present invention, plural cooling fins **10** cooperate with a liquid base assembly **20** which is defined with plural inner assembling holes **21**. Fur-

ther, the liquid base assembly **20** is provided with an inlet **22** and an outlet **23** that are in communication with the assembling holes **21**. The assembling segments **17** at both ends of the respective cooling fins **10** are disposed between two corresponding assembling holes **21** of the liquid base assembly **20** in such a manner that the passage **12** is in communication with the outlet **23** and the inlet **22**. By such arrangements, all the assembling holes **21** of the liquid base assembly **20** are connected to one another in a circulation manner. Further as shown FIG. **4**, when entering the inlet **22** of the liquid base assembly **20**, the liquid will flow into one end of the passage **12**, and then flow through the whole passage **12** of the cooling fin **10** to the other end of the passage **12**, and finally flow out of outlet **23** of the liquid base assembly **20**.

[0021] With the above operation method of the cooling fin **10**, when the liquid flows through the passage **12** of the cooling fin **10**, the heat in the liquid will be directly conducted to the board body **11** and the heat dissipating portions **14**, so that the heat will be dissipated into the air by the heat dissipating portions **14** to cool down the liquid that flows through the cooling fin **10**.

[0022] With the above structures in the preferred embodiment, the present invention has the following advantages: since the entire cooling fin **10** is integrally formed, and all the structures are integrally connected, the cooling fin **10** of the present invention has the advantages of better heat dissipation effect and further without welding or adhesive bonding means; and since a single cooling fin **10** comprises a board body **11**, a passage **12**, plural heat dissipating portions **14** and plural heat dissipating spaces **15**, there is no need for any assembling operations and procedures, thus having the advantages of easy to assemble and simple structure. The cooling fin **10** has various applications such as the cooling fin **10** can be used singly or plural cooling fins **10** are used in a cooperation manner. Further, when being used in the cooperation manner, the plural cooling fins **10** can be assembled to one another in a lapping manner as desired.

[0023] While we have shown and described various embodiments in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A cooling fin being integrally formed and comprising a board body, and a passage defined in the board body; wherein the board body is provided with an assembling segment at each of two opposite ends thereof in a direction along the passage, and plural heat dissipating portions outside thereof, between each two neighboring portions is defined a heat dissipating space.

2. The cooling fin as claimed in claim **1**, wherein the plural heat dissipating portions outside the board body are formed in the direction along the passage.

3. The cooling fin as claimed in claim **1**, wherein the cooling fin is integrally formed by aluminum extruding.

4. The cooling fin as claimed in claim **1**, wherein the passage is provided with at least one division plate.

5. The cooling fin as claimed in claim **1**, wherein the respective heat dissipating portions are defined with plural notches in a vertical direction thereof.

6. The cooling fin as claimed in claim **1**, wherein plural cooling fins are used and cooperate with a liquid base assembly, the liquid base assembly is provided with plural spaced inner assembling holes, an inlet and an outlet, the inlet and the outlet are in communication with the respective assembling hole, both ends of the respective cooling fins are disposed between two corresponding assembling holes of the liquid base assembly to make the passage communicate with the inlet and the outlet, so that all the assembling holes are connected in a circulation manner by the respective cooling fins.

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