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(54) **WATER COOLING FAN WITH MULTIPLE AIR OUTLETS**

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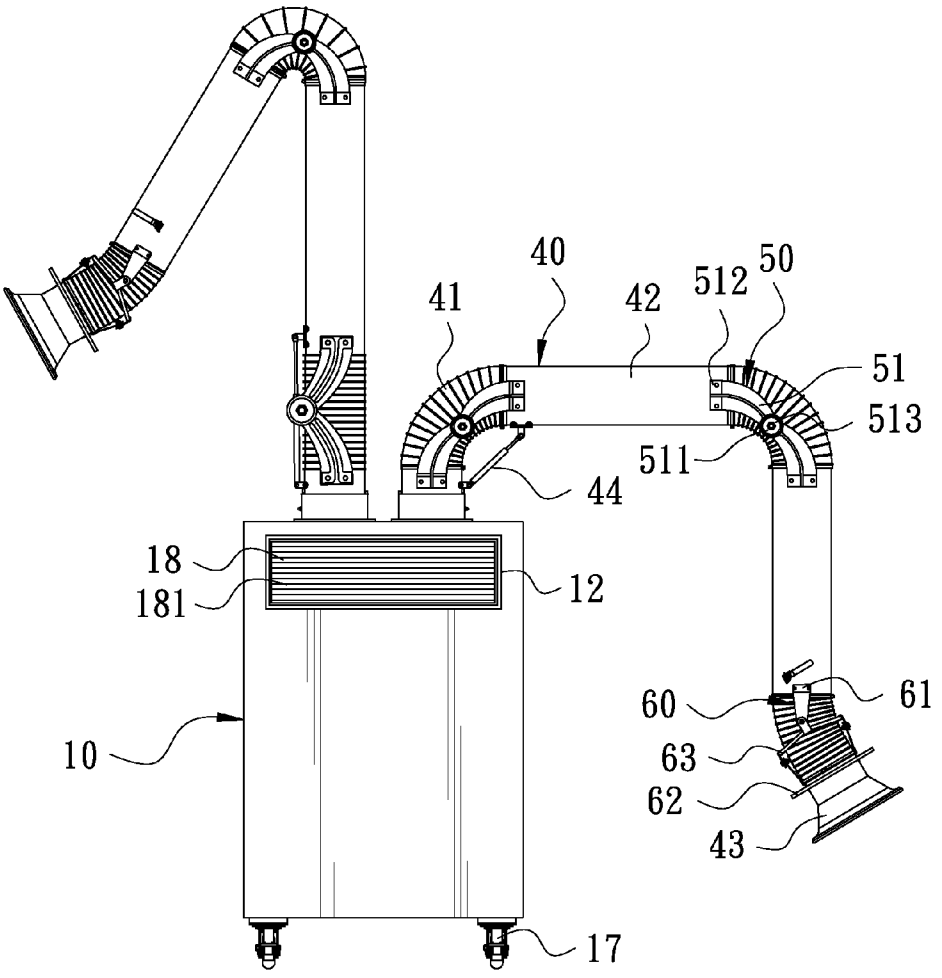
(57) **ABSTRACT**

A water cooling fan with multiple air outlets includes a housing having two opposite sides respectively formed with an air inlet and a first air outlet, and its topside bored with at least one second air outlet. An evaporative cooling pad is provided in the interior of the housing and an air discharge tube is installed at the location of the second air outlet of the housing. Thus, the water cooling fan of this invention can carry out cooling and temperature modulation to a designated region via the first air outlet and simultaneously can make use of the air discharge tube to carry out heat dissipation to respective mechanical equipment or a person. Therefore, the water cooling fan with multiple air outlets of this invention is excellent in heat dissipation speed and cooling effect, able to enhance efficiency of mechanical equipment in factory and efficacy of energy saving.



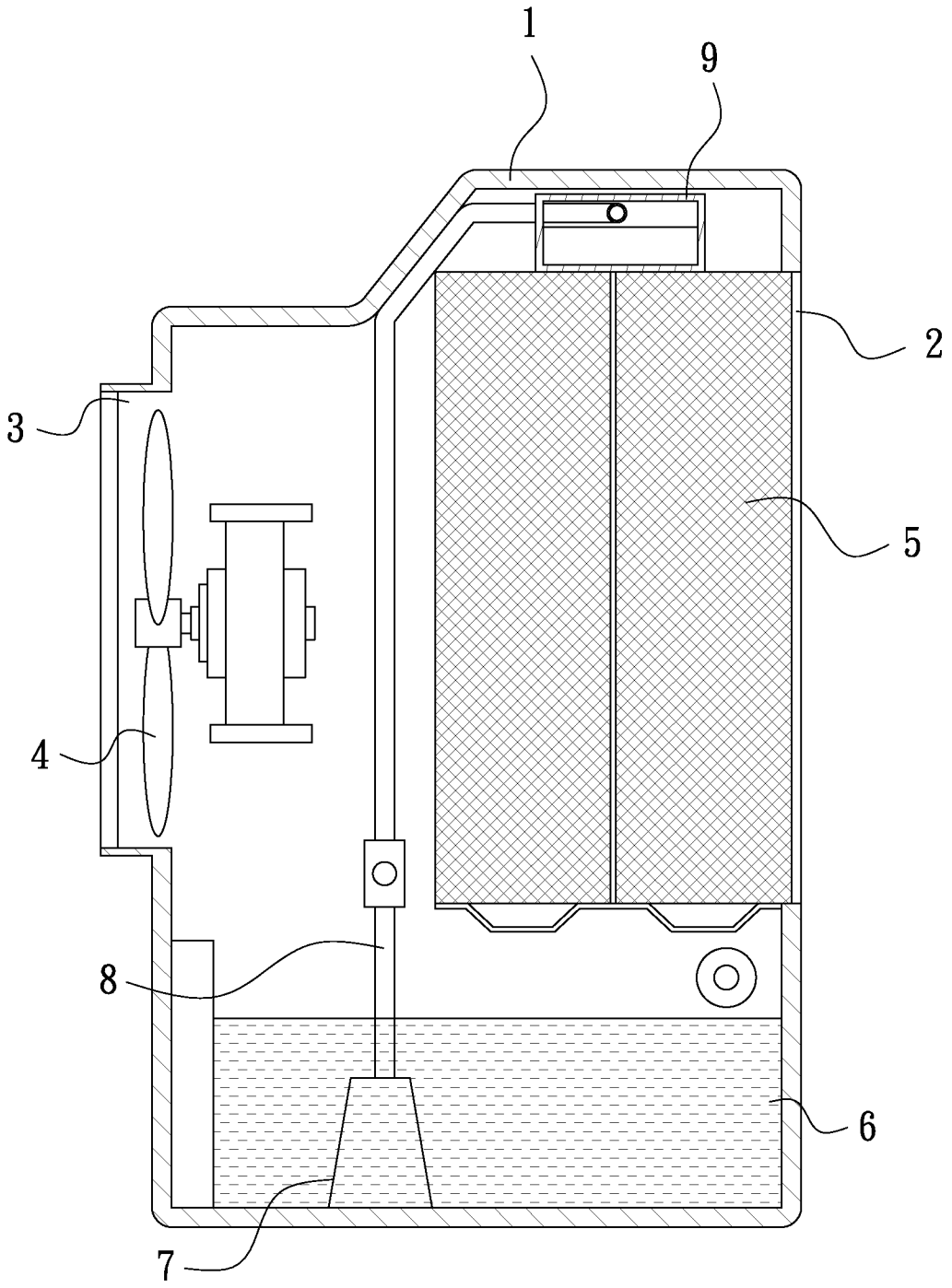


FIG. 1
PRIOR ART

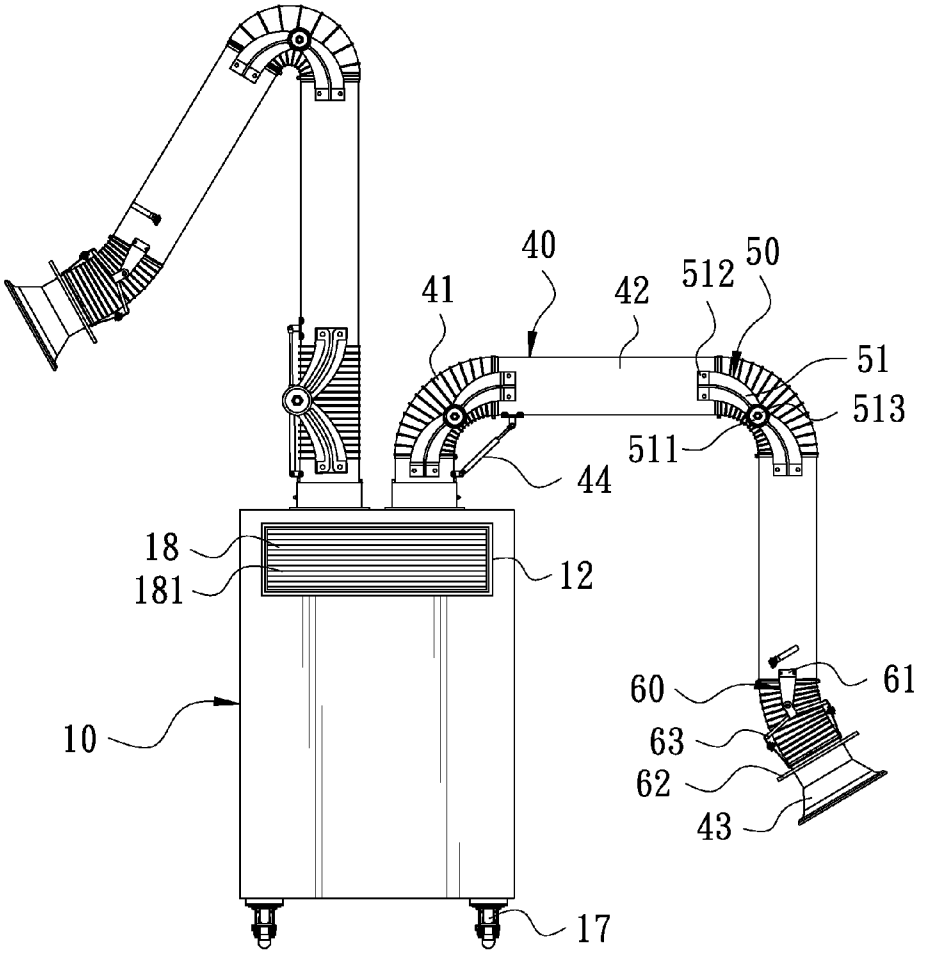


FIG. 2

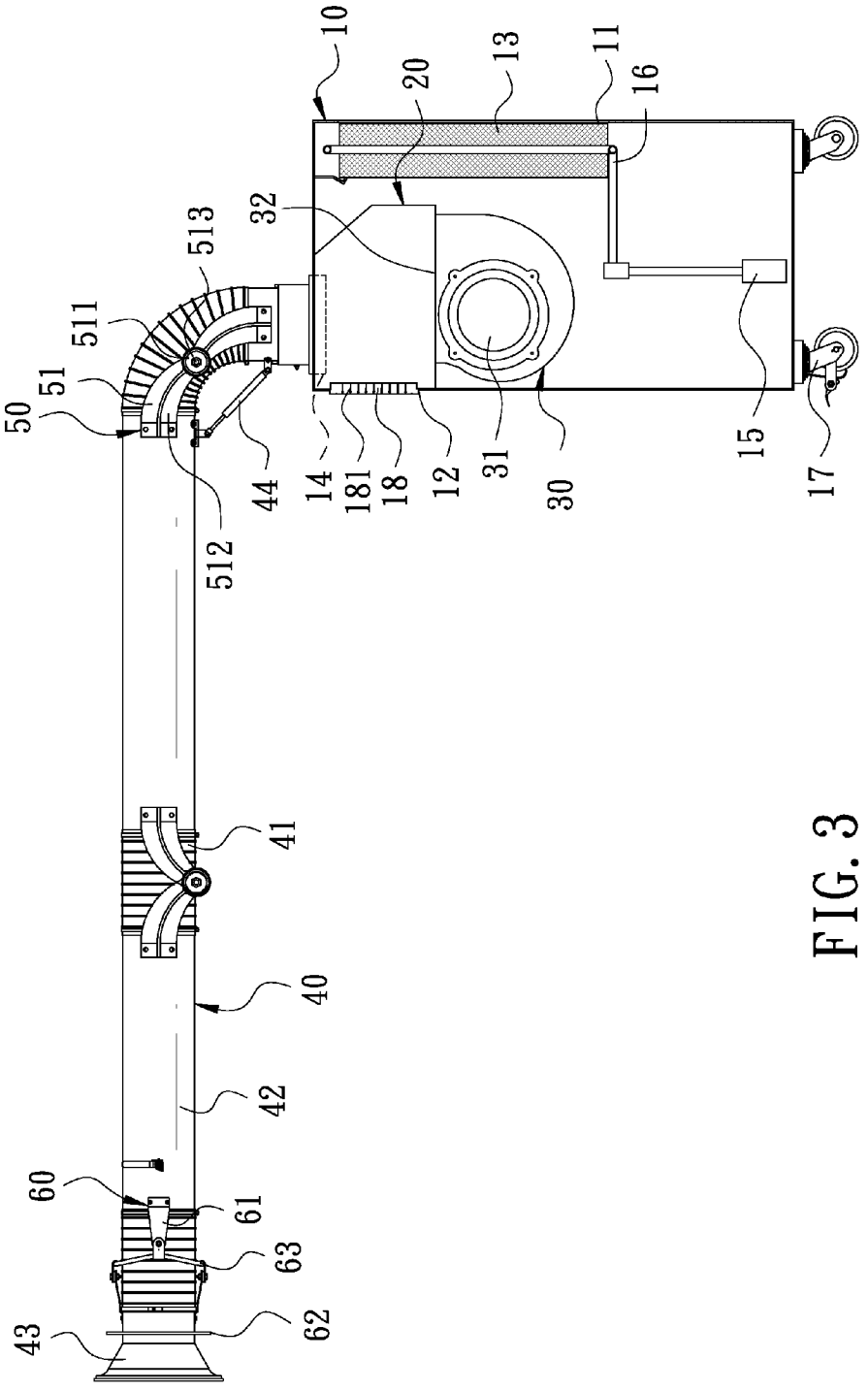

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FIG. 3

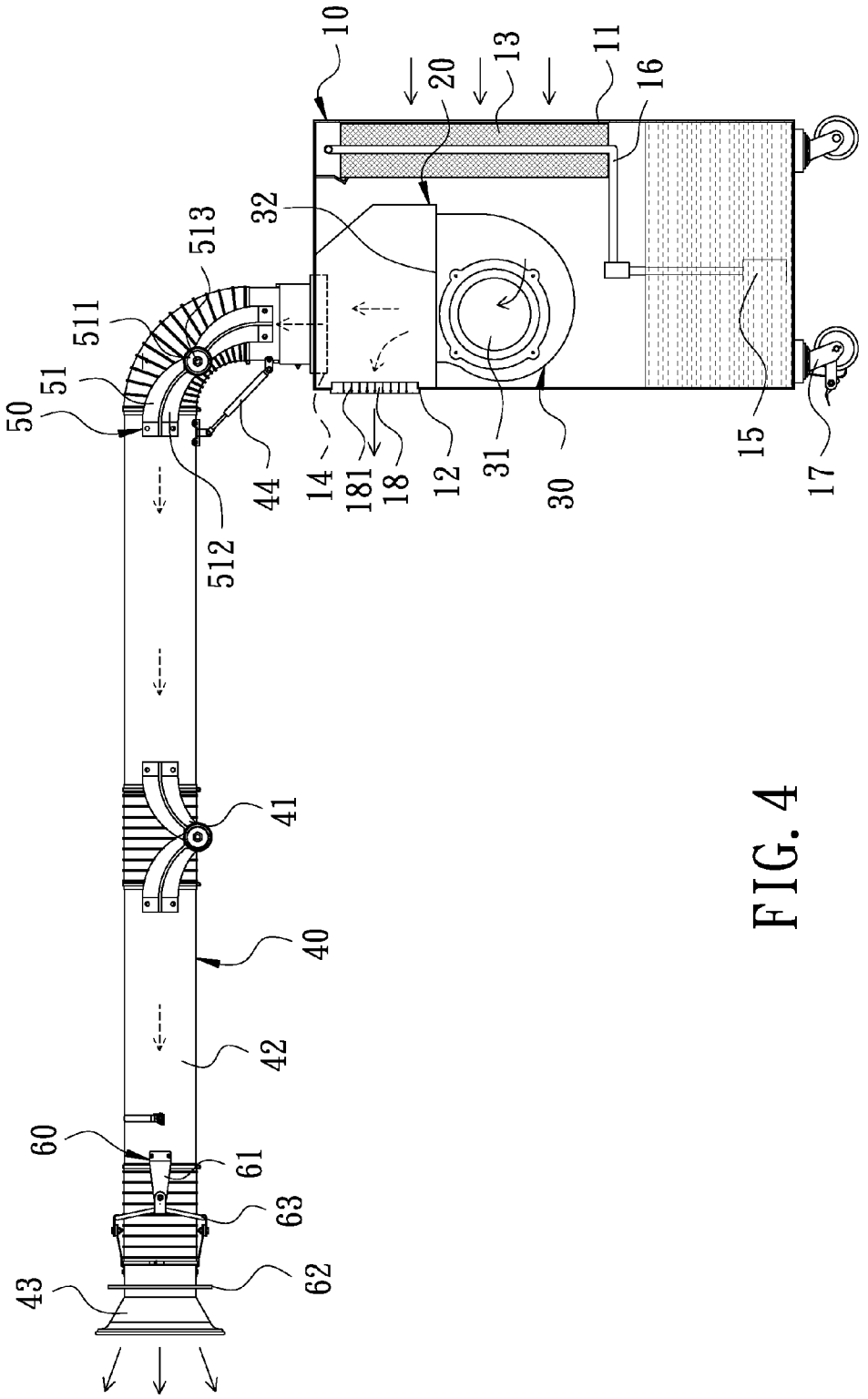
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FIG. 4

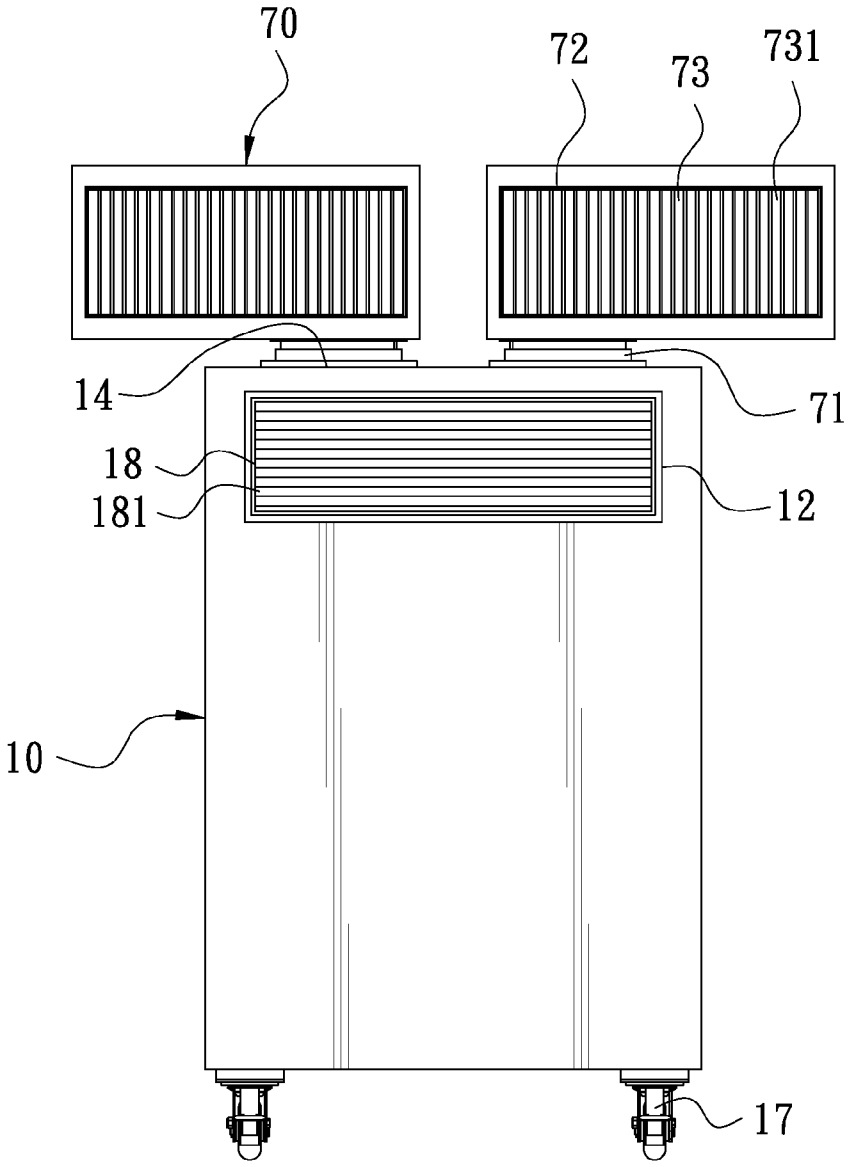

FIG. 5

WATER COOLING FAN WITH MULTIPLE AIR OUTLETS

[0001] The current application claims a foreign priority to application number 103214181 filed on Aug. 8, 2014 in Taiwan.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to a water cooling fan, particularly to one provided with multiple air outlets.

[0004] 2. Description of the Prior Art

[0005] Generally, most of factories are in operation day and night and the machines in the factory will produce high temperature when they are in an operating state and as a result, the working environment in the factory becomes extremely hot with great discomfort; therefore, cooling fans are developed and used for modulating working temperature in the factory. A conventional cooling fan, as shown in FIG. **1**, includes a housing **1** having two sides respectively bored with an air intake **2** and an air outlet **3** and its interior provided with a fan unit **4** and an evaporative cooling pad **5**, which is a structure formed of plural wavy sheets or a honeycomb-shaped structure. The housing **1** is further provided in the interior with a water storage box **6** having one side installed with a pump **7** connected with a water tube **8**, which has another end connected with a water discharge device **9** positioned on the evaporative cooling pad **5**. Thus, when the pump **7** is stared to pump water from the water storage box **6** to have the water conveyed to the water discharge device **9** and simultaneously, the water discharge device **9** will discharge water to have the water sprinkled on the evaporative cooling pad **5** and then, the water will flow back to the water storage box **6** to form a circulation. Subsequently, the fan unit **4** is started to have outside hot air getting into the housing **1** through the air intake **2** and continuously passing through the evaporative cooling pad **5**. At this time, the hot air will carry out heat exchange at the evaporative cooling pad **5** to have the air that passes through the evaporative cooling pad **5** turned into cold air and finally, the cold air is exhausted out through the air outlet **3** via the fan unit **4**.

[0006] However, the above-mentioned conventional cooling fan has the following defects:

[0007] 1. Since the conventional cooling fan is provided with only one air outlet, and the mechanical equipment in the factory building produces heat source incessantly; therefore, although the conventional cooling fan can lower the temperature of the factory building, yet the effect is limited in temperature modulation, much less carrying out cooling and temperature modulation to many people, machines or regions. Thus, heat dissipation effect of mechanical equipment is imperfect and hence likely to result in energy consumption and cause damage.

[0008] 2. The whole volume of the conventional cooling fan is comparatively large so it needs to take a lot of exertion and time to move the housing **1** to a specified location, thus wasting labor and time and causing much inconvenience to a user. Therefore, observing foresaid drawbacks, the inventor of this invention thinks that the conventional cooling fan is necessary to be further ameliorated and hence devises this invention.

SUMMARY OF THE INVENTION

[0009] The objective of this invention is to offer a water cooling fan with multiple air outlets, able to carry out cooling and temperature modulation to multiple designated regions, machines or persons.

[0010] The water cooling fan with multiple air outlets in the present invention includes a housing having two opposite sides respectively provided with an air inlet and a first air outlet and having its topside bored with at least one second air outlet. An evaporative cooling pad is provided at the location of the air inlet of the housing, and a water pump is installed at the bottom side of the housing and connected with a water discharge tube, which has another end extending out of the topside of the evaporative cooling pad, and the housing has its bottom side filled with cooling water. At least one air exhauster is installed at the location of the first air outlet of the housing and formed with an air suction opening and an exhaust vent, with the air suction opening communicating with the interior of the housing. An air guide casing is mounted at the location of the exhaust vent to make the exhaust vent communicate with both the first air outlet and the second air outlet. At least one air discharge tube is correspondingly disposed at the location of the second air outlet of the housing, extending outward to the outer side of the housing and able to be adjusted in air discharge position in accordance with need.

[0011] In using, the water pump is started to pump the cooling water in the housing and have the cooling water discharged via the water discharge tube and sprinkled on the evaporative cooling pad and simultaneously, the air exhauster functions to have the interior of the housing forming a negative pressure state to enable outside hot air to pass through the evaporative cooling pad and form cold air to be led into the interior of the housing. Meanwhile, the air exhauster functions to have the cold air exhausted out through the exhaust vent so that the cold air can be discharged through both the first air outlet and second air outlet. By so designing, the water cooling fan of this invention can carry out cooling and temperature modulation to a designated region via the first air outlet and can also make use of the air discharge tube to carry out temperature reduction to machines or persons. Thus, compared with the conventional cooling fan that is provided with only one air outlet, the water cooling fan with multiple air outlets of this invention is much better in heat dissipation rate and in cooling effect, able to enhance efficiency of mechanical equipment and attain efficacy of energy saving.

BRIEF DESCRIPTION OF DRAWINGS

[0012] This invention will be better understood by referring to the accompany drawings, wherein:

[0013] FIG. **1** is a cross-sectional view of a conventional cooling fan;

[0014] FIG. **2** is schematic view of a first preferred embodiment of a water cooling fan with multiple air outlets in the present invention;

[0015] FIG. **3** is a cross-sectional view of the first preferred embodiment of the water cooling fan with multiple air outlets in the present invention;

[0016] FIG. **4** is schematic view of the first preferred embodiment of the water cooling fan with multiple air outlets in a using state in the present invention; and

[0017] FIG. **5** is schematic view of a second preferred embodiment of a water cooling fan with multiple air outlets in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] A first preferred embodiment of a water cooling fan with multiple air outlets in the present invention, as shown in FIGS. **2** and **3**, includes a housing **10**, at least one air exhauster **30**, at least one air discharge tube **40**, a plurality of angle control members **50** and at least one joint component **60** combined together.

[0019] The housing **10** has two opposite sides respectively provided with an air intake **11** and a first air outlet **12**, and its topside bored with at least one second air outlet **14**. In this preferred embodiment, the housing **10** has its topside provided with two second air outlets **14**. An evaporative cooling pad **13** is mounted at the location of the air intake **11** and positioned in the housing **10**, and a water pump **15** is installed at the bottom side of the housing **10** and connected with a water discharge tube **16**, which has another end extending out of the topside of the evaporative cooling pad **13**. Further, the housing **10** has its bottom side filled with cooling water and its underside provided with a plurality of castors **17**. An air guide component **18** made of plural air-guiding vanes **181** is further provided at the location of the first air outlet **12** of the housing **10**.

[0020] The air exhauster **30** is installed at the location of the first air outlet **12**, formed with an air suction opening **31** and an exhaust vent **32**, with the air suction opening **31** communicating with the interior of the housing **10**. An air-guiding casing **20** is covered at the location of the exhaust vent **32** to make the exhaust vent **32** communicate with both the first air outlet **12** and the second air outlet **14**. In this preferred embodiment, two air exhausters **30** are installed to correspond with the two second air outlet **14** and have exhaust vents **32** of the air exhausters **30** communicating with both the first air outlet **12** and the second air outlet **14** via the air-guiding casing **20**.

[0021] The air discharge tube **40** is correspondingly provided at the location of the second air outlet **14** of the housing **10**, extending out of the housing **10** and able to be adjusted in air discharge positions according to need. In this preferred embodiment, the air discharge tube **40** is sectionally composed of plural extensible tubes **41** and plural hollow tubes **42** connected together. An air discharge cover **43** is mounted at the outer end of the air discharge tube **40**, and a support frame **44** is fixed at an inward side of the air discharge tube **40** at a location adjacent to the housing **10** for controlling bending positions of the air discharge tube **40**.

[0022] The angle control members **50** are positioned at the outer side of the extensible tubes **41**, respectively provided with two control plates **51**, which are respectively formed with a pivotal end **511** and a fixed end **512**. The pivotal ends **511** of the control plates **51** are pivotally combined together, while the fixed ends **512** of the control plates **51** are respectively secured at one side of the hollow tubes **42** so that the bending angles of the air discharge tube **40** can be fixed in place by the control plates **51**. In this preferred embodiment, the pivotal ends **511** are pivotally connected together by a shaft lever **513**.

[0023] The joint component **60** is correspondingly provided between the air discharge cover **43** and the hollow tube **42**, formed with two pivotal plates **61**, which are fixed at the circumferential side of the hollow tube **42**, and a toggle **62** is fitted around the circumferential side of the air discharge cover **43**. The pivotal plates **61** are connected with the toggle **62** by means of plural connecting rods **63**, letting the air discharge cover **43** able to be pivotally turned bias in all directions.

[0024] In using, referring to FIGS. **3** and **4**, firstly, the water pump **15** is started to pump the cooling water filled at the bottom side of the housing **10** and have the water discharge tube **16** discharging the cooling water and sprinkling the cooling water on the evaporative cooling pad **13**. Meanwhile, the cooling water passing through the evaporative cooling pad **13** will flow back to the bottom side of the housing **10** to from a circulation and hence, the water passing through the evaporative cooling pad **13** can be once more pumped to the water discharge tube **16**. Subsequently, the air exhauster **30** is started to have air in the housing **10** pumped into the air-guiding casing **20** to let the interior of the housing **10** formed into a negative pressure state to enable outside hot air to pass through the evaporative cooling pad **13** to carry out heat exchange and form cold air to get into the housing **10**. In the meantime, the air exhauster **30** functions to have the cold air pumped into the air-guiding casing **20** to enable the cold air to be discharged through the first air outlet **12** and the air discharge tube **40**. By so designing, the water cooling fan of this invention can not only carry out cooling and temperature modulation to designated regions via the first air outlet **12**, but also make use of the air discharge tube **40** to carry out temperature reduction to a single machine or person. Compared with the conventional cooling fan that is provided with only one air outlet, the water cooling fan with multiple air outlets of this invention is much better in heat dissipation speed and cooling effect, able to elevate efficiency of mechanical equipment and attain efficacy of energy saving.

[0025] Referring to FIGS. **2** and **4**, since the air discharge tube **40** is provided with the support frame **44** at an inward side adjacent to the housing **10**, and the air discharge tube **40** is made of plural extensible tubes **41** and plural hollow tubes **42** connected together; therefore, the air discharge tube **40** is flexible and bendable via the extensible tubes **41**. In addition, the angle control members **50** are fixed at the outer side of the extensible tube **41**, and the pivotal ends **511** of the control plates **51** are pivotally combined together and the fixed ends **512** of the control plates **51** are respectively secured at one side of the hollow tubes **42**; therefore, bending angles of the air discharge tube **40** can be fixed in place by means of the control plates **51**. Thus, the extensible tubes **41** and the control plates **51** provided in this invention enable a user to bend and adjust the angles of the air discharge tube **40** in accordance with practical need; therefore, the air discharge angles of the air discharge tube **40** of this invention can be adjusted in multi-direction and can carry out heat dissipation and cooling to mechanical equipment or people at different locations and hence, this invention has better practicability and convenience.

[0026] A second preferred embodiment of a water cooling fan with multiple air outlets in the present invention, as shown in FIG. **5**, is different from the first preferred embodiment in structure. In the second preferred embodiment, two air discharge boxes **70** are provided at the location of the second air outlet **14** at the upper side of the housing **10** and communicate with the second air outlet **14**. The two air discharge boxes **70** have their undersides respectively connected with a pivotal member **71** to enable the air discharge boxes **70** to turn around

pivotally. In this preferred embodiment, the air discharge box **70** has one side formed with a third air outlet **72**, and an air-guiding component **73** made of plural air-guiding blades **731** is provided at the location of the third air outlet **72**. Thus, when used, the air discharge boxes **70** can be pivotally turned around to carry out heat dissipation to a region that is expected to cool off, and the first air outlet **12** of the housing **10** can carry out cooling and temperature modulation to a designated region; therefore, the water cooling fan with multiple air outlets of this invention can attain effect of multiple air discharging, able to carry out cooling and heat dissipation for a large region.

[0027] What is worth mentioning is that the housing **10** of this invention has its underside provided with a plurality of castors **17**; therefore, a user can directly push the housing **10** and slidably move the housing **10** to a designated region that is needed to carry out cooling and temperature modulation, thus able to carry out heat dissipation and cooling for a part of regions, mechanical equipment or people. Compared with the conventional cooling fan that, during shifting, the whole conventional cooling fan must be moved and needs to take lots of exertion and waste much time, this invention has better mobility and convenience, able to avoid wasting labor and time.

[0028] While the preferred embodiments of the invention have been described above, it will be recognized and understood that various modifications may be made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.

What is claimed is:

1. A water cooling fan with multiple air outlets comprising:

a housing having two opposite sides respectively provided with an air inlet and a first air outlet, said housing having a topside bored with at least one second air outlet, an evaporative cooling pad provided at the location of said air inlet of said housing, said housing having a bottom side installed with a water pump, said water pump connected with a water discharge tube, said water discharge tube having another end extending out of an upper side of said evaporative cooling pad, said housing having bottom side filled with cooling water;

at least one air exhauster installed at a location of said first air outlet of said housing, said air exhauster formed with an air suction opening and an exhaust vent, said air suction opening communicating with an interior of said housing, an air-guiding casing covered at a location of said exhaust vent, said air-guiding casing making said exhaust vent communicate with both said first air outlet and said second air outlet; and

at least one air discharge tube correspondingly disposed at a location of said second air outlet of said housing, said air discharge tube extending out of said housing, air discharge positions of said air discharge tube able to be adjusted according to need;

Thus, said water pump started to pump said cooling water in said housing, said cooling water discharged via said water discharge tube and sprinkled on said evaporative cooling pad, said air exhauster functioning to make the interior of said housing form a negative pressure state to have outside hot air passing through said evaporative cooling pad and forming cold air to be led into said housing, simultaneously, said air exhauster functioning to have said cold air exhausting out through said exhaust vent so that said cold air can be discharged through both said first air outlet and said second air outlet, discharging positions of said cold air able to be adjusted via said air discharge tube.

2. The water cooling fan with multiple air outlets as claimed in claim **1**, wherein said air discharge tube is made of plural extensible tubes and plural hollow tubes connected together, said air discharge tube having an outer end provided with an air discharge cover, said air discharge tube having an inward side fixed with a support frame at a location adjacent to said housing for controlling bending positions of said air discharge tube.

3. The water cooling fan with multiple air outlets as claimed in claim **2**, wherein a plurality of angle control members are provided at an outside of said extensible tube, said angle control members respectively composed of two control plates, said control plates respectively formed with a pivotal end and a fixed end, said pivotal ends of said control plates pivotally combined together, said fixed ends of said control plates respectively secured at one side of said hollow tubes, bending angles of said air discharge tube able to be fixed in place by means of said control plates.

4. The water cooling fan with multiple air outlets as claimed in claim **2**, wherein at least one joint component is provided between said air discharge cover and said hollow tube, said joint component composed of two pivotal plates, said pivotal plates mounted at a circumferential side of said hollow tube, a toggle fitted around a circumferential side of said air discharge cover at a location adjacent to said air discharge tube, said pivotal plates connected with said toggle by plural connecting rods, said air discharge cover able to turn pivotally and swing bias in all directions.

5. The water cooling fan with multiple air outlets as claimed in claim **1**, wherein said housing is provided with an air-guiding component at a location of said first air outlet, said air-guiding component made of a plurality of air-guiding vanes.

6. The water cooling fan with multiple air outlets as claimed in claim **1**, wherein said housing is provided with a plurality of castors at the underside.

* * * * *