Feb. 14, 1939. W. H. WILBUR 2,147,475

AIR CONDITIONING APPARATUS

Filed April 9, 1937 2 Sheets-Sheet 1

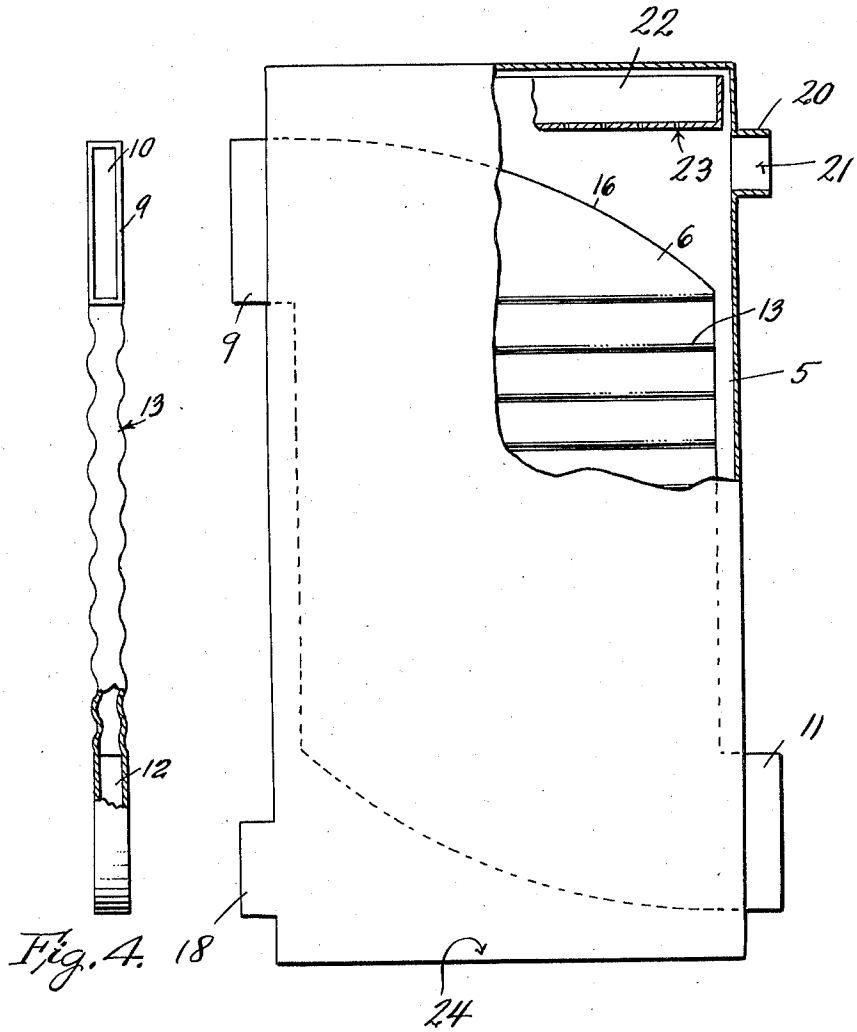


Fig. 4.

Fig. 1.

Inventor

W. H. Wilbur

By Clarence O'Brien
Hyman Berman

Attorneys

Feb. 14, 1939. W. H. WILBUR 2,147,475

AIR CONDITIONING APPARATUS

Filed April 9, 1937 2 Sheets-Sheet 2

Fig. 3.

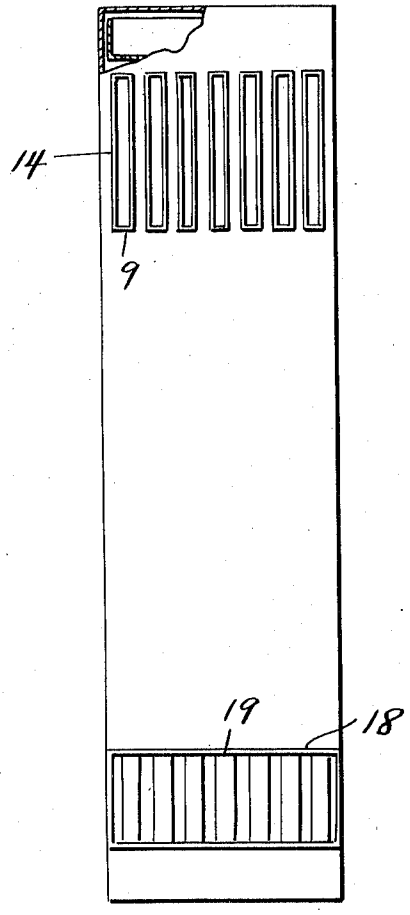
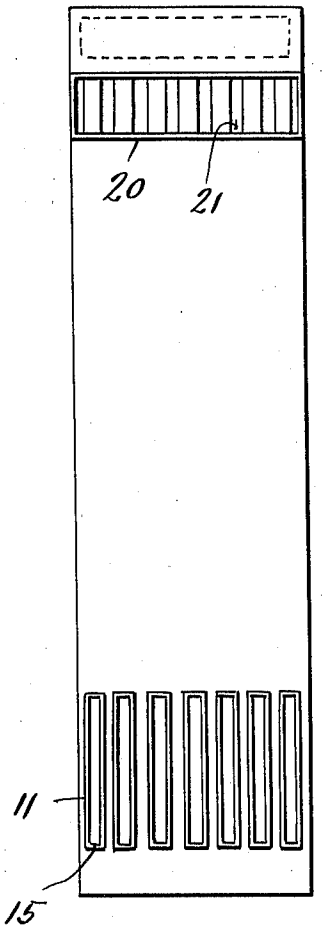


Fig. 2.



Inventor

W. H. Wilbur

By Clarence A. O'Brien
Hyman Berman

Attorneys

Patented Feb. 14, 1939

2,147,475

UNITED STATES PATENT OFFICE

2,147,475

AIR CONDITIONING APPARATUS

Walter H. Wilbur, Mesa, Ariz.

Application April 9, 1937, Serial No. 135,991

4 Claims. (Cl. 62—139)

The present invention relates to air conditioning apparatus designed particularly for use in cooling rooms or buildings and embodies a casing enclosing a plurality of spaced air ducts having inlet and discharge ports for admitting air into the room or building together with means for precipitating cooling fluid over the outside walls of each of the ducts and also for forcing air along the outside walls of each of the ducts and in a direction oppositely from the precipitating cooling fluid to set up a rapid evaporation and cooling of the fluid and the walls of the ducts over which the same passes.

A further object is to provide an apparatus of this character of simple and practical construction, relatively inexpensive to manufacture and maintain in operation and otherwise well adapted for the purposes for which the same was intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout and in which:

Figure 1 is a side elevational view of the apparatus with parts broken away and shown in section.

Figure 2 is an elevational view of the intake end of the casing.

Figure 3 is a similar view of the discharge end thereof, and

Figure 4 is an edge elevational view thereof.

Referring now to the drawings in detail, wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention the numeral 5 designates a substantially rectangular casing within which is arranged a plurality of substantially flat air ducts 6 in spaced parallel relation, said air ducts embodying a top section 7 and bottom section 8, the top section having a lateral extension 9 provided with an opening 10 at the vertical side edge of the duct and the bottom section 8 having a similar extension 11 opening at 12 and in the relatively opposite vertical side wall of the duct, said upper opening 10 constituting an air intake port and the lower opening 12 constituting an air discharge port. The walls of the duct between the upper and lower sections 7 and 8 are corrugated horizontally as shown at 13, the corrugations of the respective opposite walls of the ducts being substantially parallel as is more clearly illustrated in Fig. 5 of the drawings.

The upper lateral extension 9 of the ducts are projected through openings 14 in the side walls of the casing 5 and the lower lateral extensions 11 of the ducts are projected through openings 15 in the opposite side wall of the casing.

The top and bottom edges of the ducts recede as shown at 16 and 17 respectively toward the side of the duct oppositely from the respective intake and discharge ports 10 and 12.

The side of the casing 5 provided with the air intake ports 10 is also provided at its lower portion with an air intake extension 18 having an elongated horizontally extending air intake port 19 and the side of the casing provided with the air discharge ports 12 is provided at its upper portion with a lateral extension 20 having an elongated horizontally extending air discharge opening 21 therein.

The upper and lower sections 7 and 9 may be corrugated horizontally and the upper and lower edges of the ducts may be parallel with the top and bottom of the casing. The section 8 may be reversed, if desired, so that the intake and discharge ports are on the same or opposite sides of the ducts. Also the direction of the passage of the air through the ducts may be reversed, if desired, thus making 12 the intake and 10 the outlet. The direction of flow of air through said ducts depending upon whether or not the fluid being discharged has or has not been pre-cooled.

Mounted within the casing above the ducts 6 is a fluid pan or reservoir 22 having discharge perforations 23 in its bottom for discharging cooling fluid upon the upper edges of the ducts for dripping over the outer corrugated surfaces thereof, the fluid being collected in the bottom 24 of the casing.

With the parts assembled in the manner illustrated in Figs. 1 to 3 of the drawings water or other cooling fluid will drip continuously from the reservoir 22 over the vertical side walls of the ducts in the spaces between said ducts and at the same time air is forced or drawn through the casing through the lower opening 19 upwardly in a direction oppositely to the flow of the cooling fluid, the velocity of the air serving to break up the dripping or falling water or other cooling fluid and force contact thereof with all portions of the side walls of the ducts as well as to enhance evaporation of the water or said fluid, thus cooling the opposed walls of the several ducts. Air drawn or forced into the upper intake ports of the ducts travels downwardly contacting all portions of the side walls which are being cooled and will be discharged from the lower discharge ports in a dry and cool condition.

It will be understood that any suitable means may be provided for forcing or drawing the air through the casing and through the ducts and a suitable pump mechanism may also be provided for returning the cooling fluid from the bottom 24 of the casing to the reservoir 22 or other suitable distributive medium to provide a continuous evenly distributed flow of the cooling fluid over the walls of the ducts.

Furthermore any suitable provision may be made for connecting the intake ports 14 of the ducts and 19 of the casing to draw outside air therethrough and providing a suitable connection for discharging the air from the ports 15 into the room or building and for discharging the wet air from the port 21 into the atmosphere.

It is believed the details of construction and operation of the device will be readily understood from the foregoing without further detailed explanation.

The present embodiment of the invention has been described in considerable detail merely for the purposes of exemplification since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

What is claimed is:—

1. An air conditioning apparatus comprising a casing, a plurality of individual air ducts mounted in the casing in spaced parallel relation, each of said air ducts comprising spaced apart horizontally corrugated vertical side walls of subtantially rectangular shape connected at their side and top and bottom edges, intake and discharge ports at opposite corners of the ducts projecting outwardly of the casing, said casing having a lower air intake port and an upper air discharge port to provide for the circulation of air upwardly along the outer surfaces of the ducts and means for precipitating a cooling fluid over the walls of the ducts in contact with air passing through the casing.

2. An air conditioning apparatus comprising a substantially rectangular casing, a plurality of substantially flat individual air ducts mounted in spaced relation in the casing, each of said air ducts comprising spaced apart horizontally corrugated vertical side walls of substantially rectangular shape connected at their side, top and bottom edges and provided with individual air intake ports at their upper portions and air discharge ports at relatively opposite sides at their lower portions each of said ports projecting outwardly of the casing, said casing having an air intake port at its lower portion and an air discharge port at a relatively opposite side at the upper portion of the casing for circulating air between the opposed walls of the respective ducts and means for discharging fluid over the outer walls of the ducts and in contact with the air circulating through the casing.

3. An air conditioning apparatus comprising a substantially rectangular casing, a plurality of substantially flat rectangular air ducts each of said air ducts comprising spaced apart horizontally corrugated vertical side walls connected at their side, top and bottom edges and provided with individual air intake ports at their lower portions and air discharge ports at a relatively opposite side of their upper portion, each of said ports projecting outwardly of the casing said casing having an air intake port at its lower portion and an air discharge port at a relatively opposite side of its upper portion for circulating air between the opposed walls of the respective ducts and means for discharging fluid over the outer walls of the ducts in contact with the air circulating through the casing.

4. An air conditioning apparatus comprising a substantially rectangular casing containing a plurality of substantially flat rectangular air ducts arranged in spaced parallel relation within the casing each of said air ducts comprising spaced apart horizontally corrugated vertical side walls connected at their side, top and bottom edges and provided with individual air intake ports and air outlet ports at diametrically opposite corners projecting outwardly of the casing and through which air may be forced or drawn in either direction, means for precipitating cooling fluid over and between said ducts, means for circulating air along the walls of the ducts in contact with and in a direction opposite to that of the fluid, said horizontally corrugated vertical side walls of the ducts being set in spaced parallel position forming a series of tortuous passages through which the air and fluid when passing is constantly changing direction to enhance evaporation of the fluid.

WALTER H. WILBUR.