April 23, 1929. G. F. SCHMITT 1,710,323

HEAT TRANSFERRING DEVICE

Filed Sept. 30, 1926

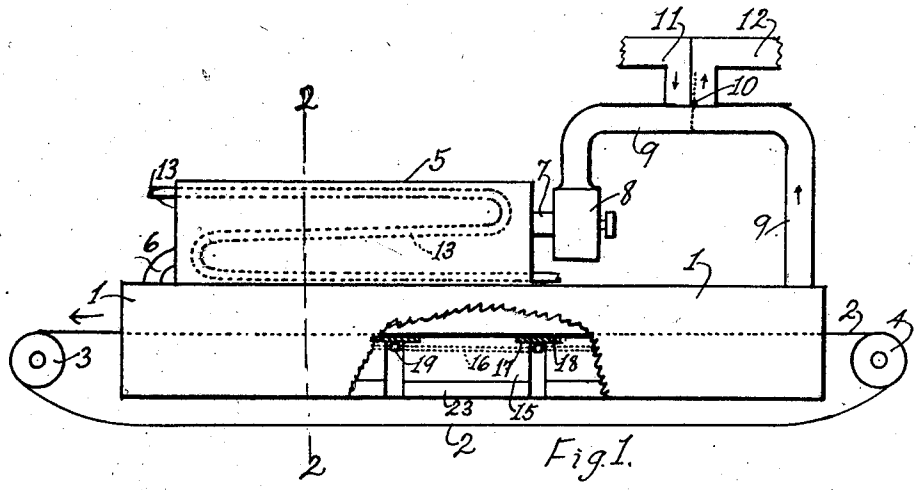


Fig. 1.

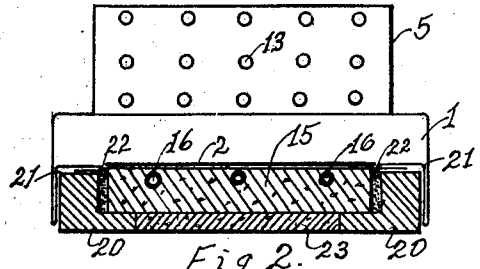


Fig. 2.

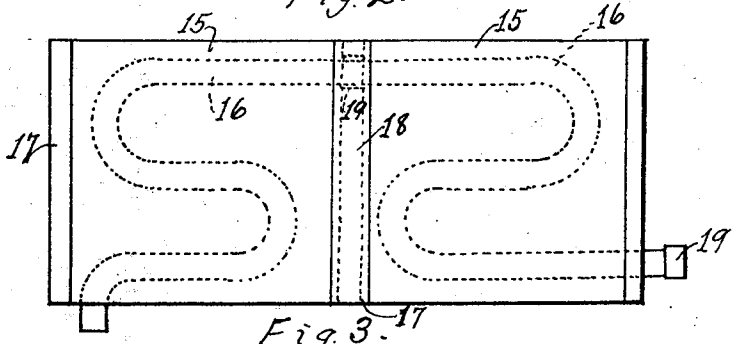


Fig. 3.

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UNITED STATES PATENT OFFICE.

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HEAT-TRANSFERRING DEVICE.

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This invention relates to a device whereby heat may be transferred to or abstracted from articles for the purpose of changing the temperature of the articles. In carrying out this invention the articles, of which the temperatures are to be changed, are placed upon a conveyor which may be in the form of a belt that passes over rollers and are carried through a housing where heat is abstracted from or transferred to the articles. The heat transfer is from or to a fluid that may be kept circulating out of contact with the articles and at the same time a gas or air may be brought into direct contact with the articles in order to aid changing the temperature thereof while it is on the conveyor in the housing.

The invention will be understood from the description in connection with the accompanying drawings in which Figure 1 is a side elevation of an illustrative embodiment of the invention partly broken away; Fig. 2 is a section along the line 2—2 of Fig. 1 and Fig. 3 is a plan view showing some of the details. In the drawings, reference character 1 indicates a casing or housing that may be made of sheet metal. A carrier or conveyor 2 consisting of a belt passes through the casing 1 and around rollers 3 and 4 on the outside of the casing, one or both of which rollers may be driven in any convenient manner. A compartment 5 is located above the casing 1 and a conduit 6 leads from one end of the compartment 5 into the upper side of the casing 1, while a conduit 7 leads from the other end of the compartment to a fan 8, from which a conduit 9 leads into the top of the casing 1 near the opposite end thereof. A valve 10 is located near the point where the air inlet 11 and air outlet 12 join the conduit 9 and can be turned, as shown in solid lines, to shut off the inlet 11 and outlet 12 to the atmosphere, while leaving the conduit 9 open, or it can be turned, as shown in dotted lines, to extend across the conduit 9 and open communication of the same to the air inlet 11 and outlet 12. A coil 13 for fluid is located in the compartment 5.

The means for changing the temperature of the article to be treated comprises a row of concrete slabs 15 that are placed end to end. Each one of these slabs has a coil 16 of pipe embedded in the same near the upper surface thereof so that heat can readily pass from the fluid in the coils to the surface, or vice versa. The slabs 15 may be spaced slightly apart at their ends and notches or recesses 17 may be provided, in which plates 18 are placed so as to make a smooth surface along the upper sides of the slabs and the spaces between the same. The coil pipes 16 may terminate in unions 19 between the slabs so that the coils in the successive slabs can be readily connected for the purpose of causing the fluid used for changing the temperatures of the articles to flow from a coil in one slab to a coil in the next slab.

The concrete slabs 15 rest upon wood supports 20 that are L-shaped in cross section and are disposed longitudinally along the edges of the slabs. These wood supports 20, not only support the concrete slabs, but also insulate the edges thereof to prevent heat from passing horizontally to or from the edges of the slabs. The sides of the casing 1 may be bent, as shown at 21, to extend along the outside edges and over the top portion of the supports 20, and heat insulating material 22 may be interposed between the edges of the slabs 15 and the bent portions 21 of the metal sheets. Heat insulating material 23, such as cork, for example, may be laid beneath the slabs 15 and between the wood supports 20 to prevent passage of heat in a vertical direction.

The operation of the device will be described in connection with cooling articles and it will be readily understood that if articles are to be heated the device can be used in a similar way, except that the fluids used will be hot instead of cold. The articles to be cooled are placed upon the conveyor 2 and carried into the casing 1 in the direction of the arrow shown in Figure 1. Cold fluid is passed through the coils 16 preferably in a countercurrent direction with respect to the travel of the articles that are to be cooled, whereupon the upper surfaces of the slabs of concrete 15 are chilled and as the conveyor 2 passes over the same in sliding contact therewith it is cooled thereby, causing the articles on the conveyor to be cooled.

At the same time cold fluid is passed through the coil 13 in the casing 5 and air is caused to be forced by means of the pump or fan 8 through the compartment 5 where it is cooled and thence into the casing 1 where it comes into contact with the articles and aids in cooling the same. In case the air coming

into contact with the articles becomes warmed above the temperature of the atmosphere, the valve 10 is turned into the dotted line position so that the warmed air will pass out through the opening 12 and fresh cool air will enter through the inlet 11 and be further cooled by means of the coil 13 in the compartment 5. If the air passing through the casing 1 does not become heated up to the temperature of the outside air, the valve 10 is kept in the solid line position, thus permitting recirculation of the cooling air.

It will be noted that with this invention the concrete slabs 15 can be readily installed and taken out, so that the number of slabs used or the size of the device can be readily altered to suit conditions. Since the cooling coils 16 are located near the upper surfaces of the slabs 15, these surfaces will be kept cold by the cold liquid in the coils, so that the device will operate satisfactorily for its intended purpose, and since the slabs are heat insulated along the edges and bottom portions, the danger of heat entering from the outside and decreasing the efficiency of the device is obviated. The upper surfaces of the slabs are smooth and therefore afford a suitable support along which the conveyor 2 can be drawn while the articles thereon are being cooled.

I claim:

1. In a device of the class described, a housing, a conveyor extending through said housing, and heat transferring means comprising concrete slabs located in said housing, said slabs having pipes embedded in the same near the upper surfaces thereof and connected in a row.

2. In a device of the class described, a housing, a conveyor extending through said housing, and heat transferring means comprising concrete slabs located in said housing, said slabs being provided with passages for a heat transferring medium and being slightly separated from each other at their ends and plates bridging the spaces between said slabs.

3. In a device of the class described, a housing, a conveyor extending through said housing, and heat transferring means comprising concrete slabs located in said housing, said slabs being provided with passages for a heat transferring medium, and heat insulating means along the edges and bottom of said slabs.

4. In a device of the class described, a housing, a conveyor extending through said housing, and heat transferring means comprising concrete slabs located in said housing, said slabs being provided with a heat transferring medium, means for changing the temperature of air and passing it through said housing and means comprising a compartment for changing the temperature of air and passing it through said compartment, a conduit connecting said compartment and housing, and a valve by which air can be caused to recirculate or fresh air can be introduced into said device.

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