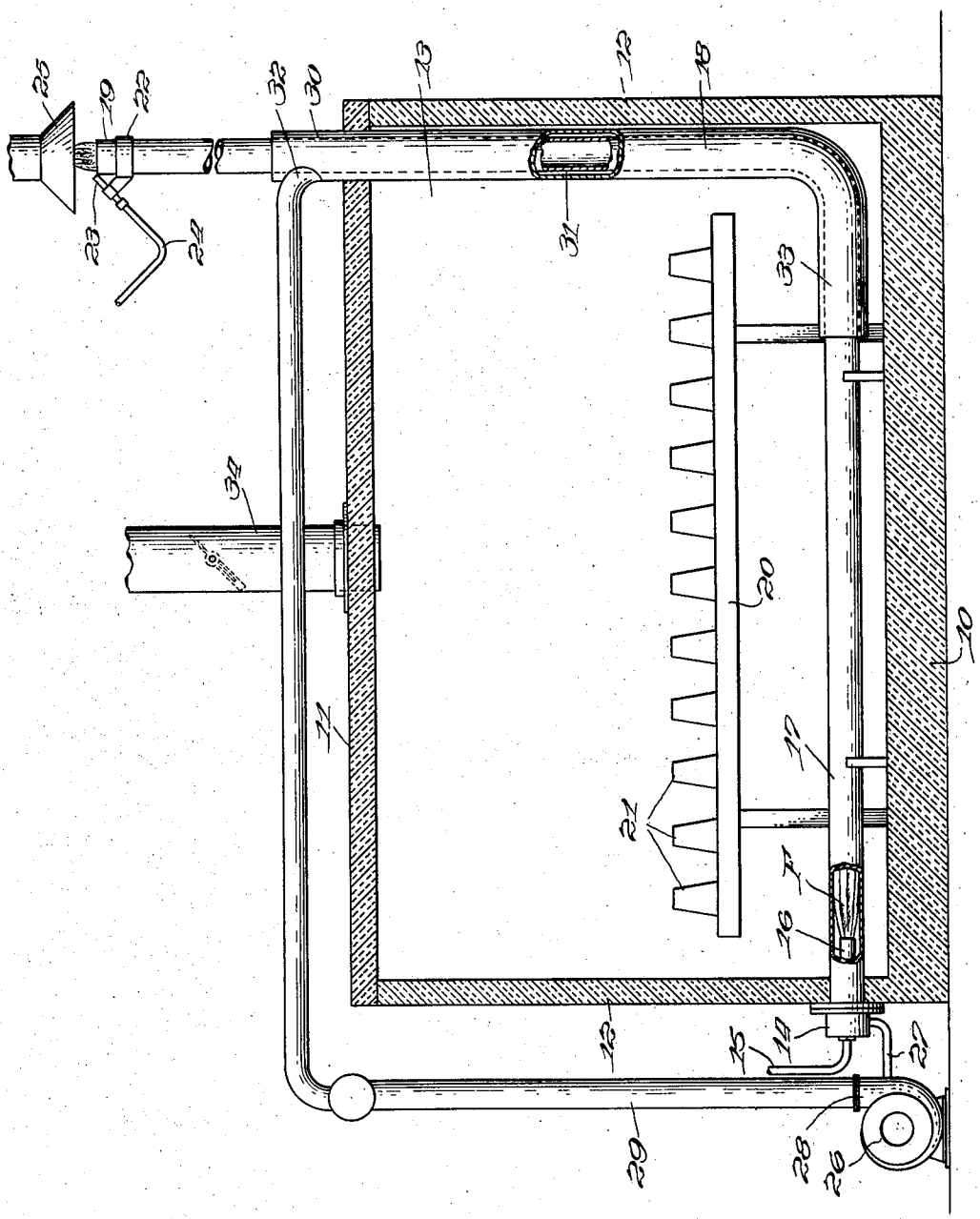
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OVEN

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Inventor:
Edward W. Cooney.
By Paul O. Pippel
Atty.

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OVEN

Edward W. Cooney, Woodstock, Ill., assignor to International Harvester Company, a corporation of New Jersey

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This invention relates to an oven, and more particularly to an oven of the type used for drying various forms of articles.

In an oven of one particular type in which the invention finds its greatest utility there is provided a chamber which is heated to provide dry heated air. Articles, such as molding cores or the like, are placed within the chamber and the temperature of the oven is brought up to the point necessary to dry or otherwise treat the articles within the chamber. In those circumstances where the particular treatment is that of drying, it is important that the drying process be performed as quickly and as efficiently as possible. To this end, then, it is important to exclude from the oven such elements as will interfere with the drying process, among the most undesirable elements of this type being moisture.

It is, accordingly, a principal object of this invention to provide an oven within which the air may be heated to the exclusion of the admission of moisture to the heating chamber.

An important object is to provide a heating means adapted to carry a flame across the drying chamber, this means serving to confine the flame against direct contact with the interior of the chamber, thus excluding from the chamber the products of fuel combustion.

Another important object is to provide a heating element which exhausts or vents outside the oven chamber.

One of the main objects of the invention is to provide means for supplying air under pressure to the oven in a manner whereby the air will be heated by the heating element in the oven.

An important object is to provide the heating means and the air-supplying means at a lower portion of the oven, so that the heated air will rise in the oven to provide an efficient drying process for articles within the oven chamber.

Another object is to provide a common blower or pressure means for supplying air to both the heating element and a jacket or heat exchanger associated with the heating element.

Still another object is to provide a pilot burner in conjunction with the exhaust end of the heating element to insure a continuous flame in the element.

The foregoing and other desirable objects and features of the invention will become apparent to those skilled in the art as the disclosure is more fully made.

The single figure in the accompanying drawing illustrates a sectional view through an oven of one particular type, in which is installed a device constructed according to the principles of the present invention.

The oven shown in the drawing comprises a bottom wall 10, a top wall 11, and a plurality of side walls 12 to form a walled oven chamber 13. The walls are constructed of suitable material, all of which is generally conventional. A fuel burner 14 is carried by a side wall 12 outside the chamber 13. This burner is connected by a conduit 15 to a source of fuel supply. The fuel may be gas of the type ordinarily used in furnace and oven operations. The burner includes a nozzle 16 which supplies or directs a continuous flame into the chamber. The flame is indicated generally at F. Means is supplied for carrying the flame across the chamber 13 adjacent the bottom wall 10, and comprises an imperforate heating element, or tube, 17 connected at one end to the burner outlet 16 and extending across the chamber 13. Adjacent one of the side walls 12, the tube 17 is provided with an integral, upwardly extending portion 18 which parallels the wall 12 and which extends out through the upper wall 11, as at 19. As previously stated, the tube 17 is imperforate and is open only to the atmosphere outside the chamber 13. Thus, the flame F is confined within the tube against direct contact with the interior of the chamber 13. The tube is located at a lower portion of the chamber, so that the heat therefrom rises in the chamber. For the purposes of illustration, the oven is shown as containing a rack 20 on which is carried a plurality of articles to be treated or dried, as at 21. These articles may be molding cores or any other articles which require a process capable of performance by the heating apparatus herein disclosed.

The portion of the tube 19 outside the oven chamber 13 carries a bracket 22 which supports a small burner element 23. This element is provided with a conduit 24 which is connected to a source of fuel supply. The conduit 24 is connected to fuel independently of the connection 15 to the burner 14, so that a continuous supply of fuel is insured to the burner 23 regardless of whether or not fuel is supplied to the burner 14. Thus, the burner 23 constitutes a pilot burner which insures ignition of the flame in the tube 17 as long as fuel is supplied to the burner outlet 16. A hood 25 is disposed above the exhaust end 19 of the tube and serves to carry off the exhaust fumes.

The numeral 26 indicates a blower means for supplying air to the burner 14 to be mixed with

the fuel 16 in the conventional manner. The blower 26 and the burner 14 are connected by a conduit 27. The blower 26 includes a second outlet 28, to which is connected a tube 29 which extends upwardly outside the left-hand wall 12 and across the oven outside the wall 11. The vertical portion 18 of the tube 17 is surrounded by means providing a heating jacket or heat exchanger 30. As shown in the portion of the tube and jacket broken away in the drawing, the disposition of the jacket 30 and the tube portion 18 provides an annular space therebetween, as indicated at 31. The air conduit 29 communicates with the jacket 30 outside the chamber 13, as at 32. Thus, the blower 26 supplies air under pressure to the jacket or exchanger 30. The jacket extends vertically downwardly about the tube portion 18 and further extends, as at 33, about a portion of the horizontal tube 17. The outlet end 33 of the jacket is thus disposed at a lower portion of the chamber 13. The air supplied by the blower through the tube 29 and jacket 30 is thus heated by the tube portions 17 and 18 and discharged at the bottom of the chamber below the rack 20. Accordingly, the chamber is heated both by the tube 17 and by the air forced into the chamber by the blower 26 through the heat exchanger jacket 30. The structure of the oven is completed by the provision of a vent 34 which vents the chamber 13.

As stated above, one important feature of the invention is the imperforate heating tube 17. Since the tube is imperforate, the flame F has no direct contact with the interior of the chamber and thus the moisture ordinarily resulting as a product of fuel combustion is precluded from entering the chamber. This arrangement insures that the air in the chamber will be both hot and dry. Furthermore, the confining of the flame within the tube eliminates the escape in the chamber of other products of fuel combustion which may have an undesirable effect on the articles treated in the oven. The provision and disposition of the heat exchanger jacket in conjunction with the blower 26 insures a constant supply of heated air at an advantageous point in the oven, so that articles placed in the oven may be quickly and efficiently treated by the combination of heat and air.

The safety features incorporated in the construction consist of the pilot burner 23, hood 25, and the vent 34, all of which contribute to the operation of the oven without hazard.

Although the foregoing description has related to an oven which is primarily useful in the treating of articles, it will be understood that the principles of the invention may be otherwise applicable in other instances. It will be further understood that only a preferred embodiment of the invention has been illustrated and described, and that numerous modifications and alterations may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A heating and drying oven comprising a walled drying chamber, a fuel burner having an outlet adapted to direct a flame into the chamber, means passing through the chamber and opening outside the chamber for confining the flame against direct contact with the interior of the chamber, means for directing air into the oven for drying purposes, and means for directing said air under pressure first alongside a portion of the first means within the chamber for heating said air within the chamber.

2. A heating and drying oven comprising a walled drying chamber, a fuel burner outside the chamber, means connected to the burner including an imperforate heating tube passing through the chamber and exhausting outside the chamber, a second tube for the inlet of drying air surrounding a portion of the heating tube inside the chamber, and means for directing incoming drying air into the second tube to be heated by the first tube.

3. A heating and drying oven comprising a walled drying chamber, a fuel burner having an outlet adapted to direct a flame into the chamber, an imperforate heating tube connected at one end to the burner outlet and having a first portion extending across the chamber and a second portion directed away from the first portion, the end of said second portion extending outside the chamber, a heating jacket surrounding the second portion of the tube and extending outside the chamber along with said second tube portion, said heating jacket opening within the chamber and means for directing air for drying purposes into the heating jacket to be heated by the second tube portion and for discharge into the chamber.

4. A heating and drying oven comprising a drying chamber, a fuel burner disposed outside the chamber and having an outlet adapted to direct a flame into the chamber, an imperforate heating tube connected to the burner outlet and extending inside and along a lower portion of the chamber, and means for forcing a current of air for drying purposes through a conduit to a lower portion of the chamber and in heat exchange relationship with said tube and an exhausting of the dry air within the oven chamber.

5. A heating and drying oven comprising a walled drying chamber, a fuel burner outside the chamber, means connected to the burner including an imperforate heating tube passing through the chamber and exhausting outside the chamber, a second tube for the inlet of drying air surrounding a portion of the heating tube inside the chamber, means for directing incoming drying air into the second tube to be heated by the first tube, and a safety pilot burner outside the chamber adjacent the exhaust end of the first-named tube, whereby if the fuel burner flame is accidentally extinguished the safety pilot will ignite the escaping fuel.

EDWARD W. COONEY.