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[45] Patented **Jan. 12, 1971**

[56] **References Cited**

**UNITED STATES PATENTS**

1,144,896	6/1915	Fosbraey .....	34/155X
2,488,937	11/1949	Roberts .....	263/3X
3,271,016	9/1966	Marks .....	263/3

**FOREIGN PATENTS**

522,654	6/1940	Great Britain .....	263/3
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Primary Examiner—Charles J. Myhre  
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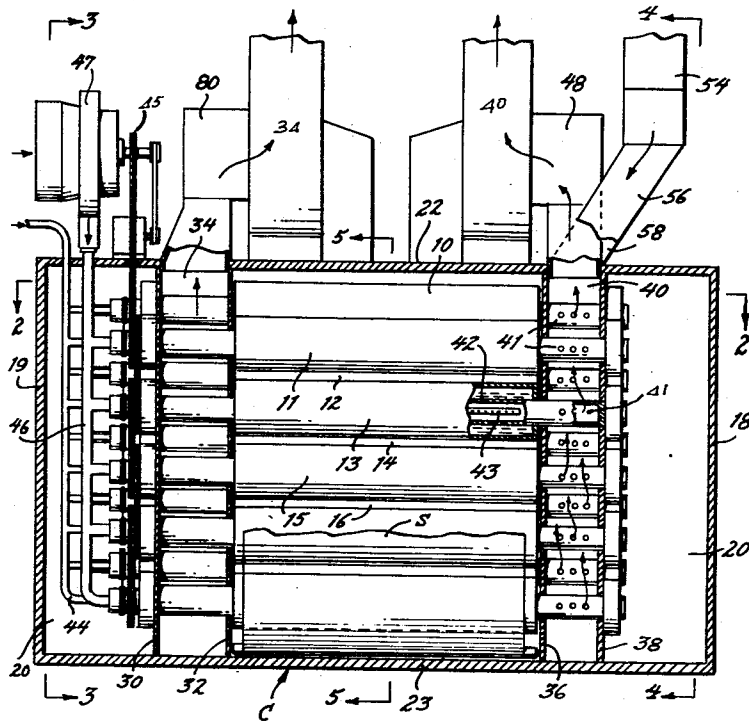
[54] **MACHINE FOR HEAT TREATING SHEET MATERIAL**  
 5 Claims, 8 Drawing Figs.

[52] U.S. Cl. .... 263/3,  
 34/155

[51] Int. Cl. .... F27b 9/28

[50] Field of Search..... 263/3, 6C;  
 34/155, 159

**ABSTRACT:** A plurality of heated, rotary rolls over which the sheet material to be treated passes; a casing enclosing said rolls; an exhaust system for the gaseous products of combustion, and a separate exhaust system for the fumes generated by the application of heat to the sheet material as it moves through said casing.



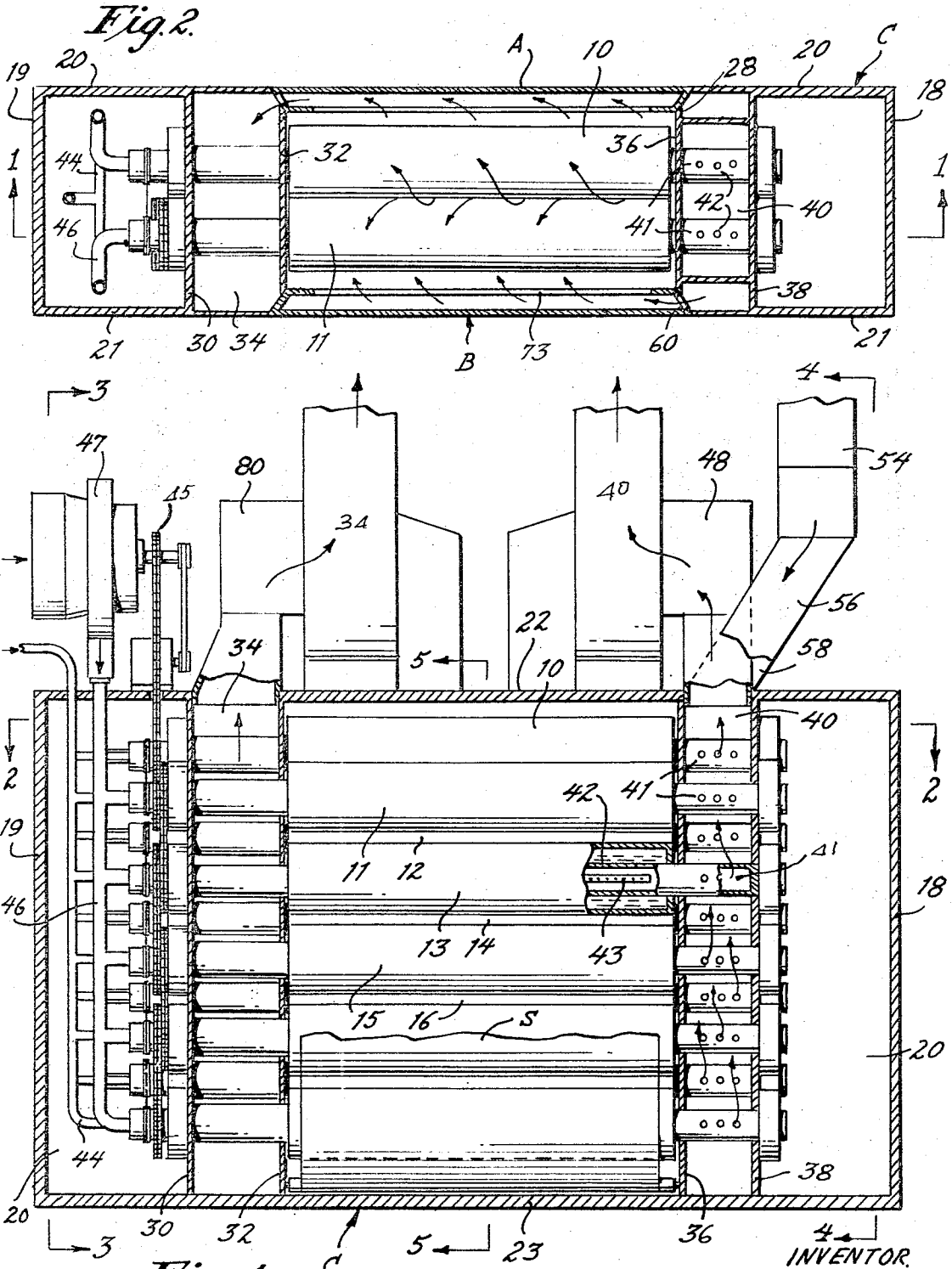


Fig. 1.

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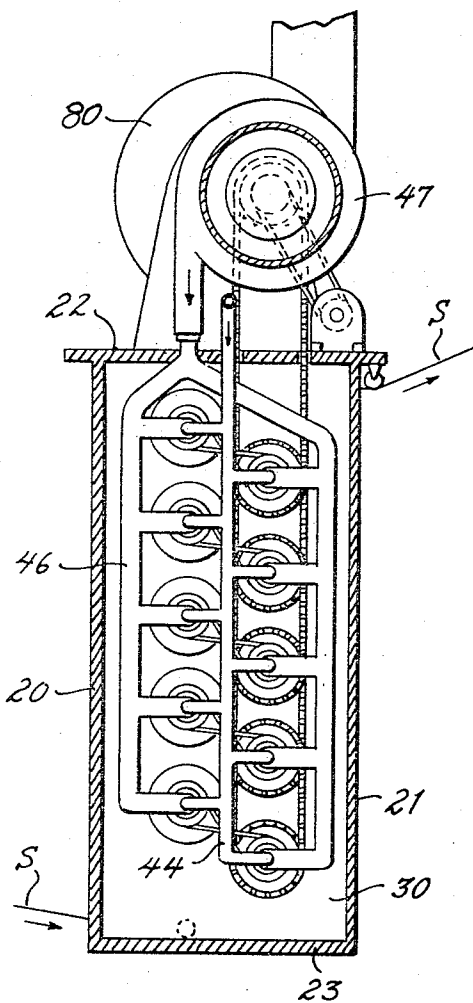


Fig. 3.

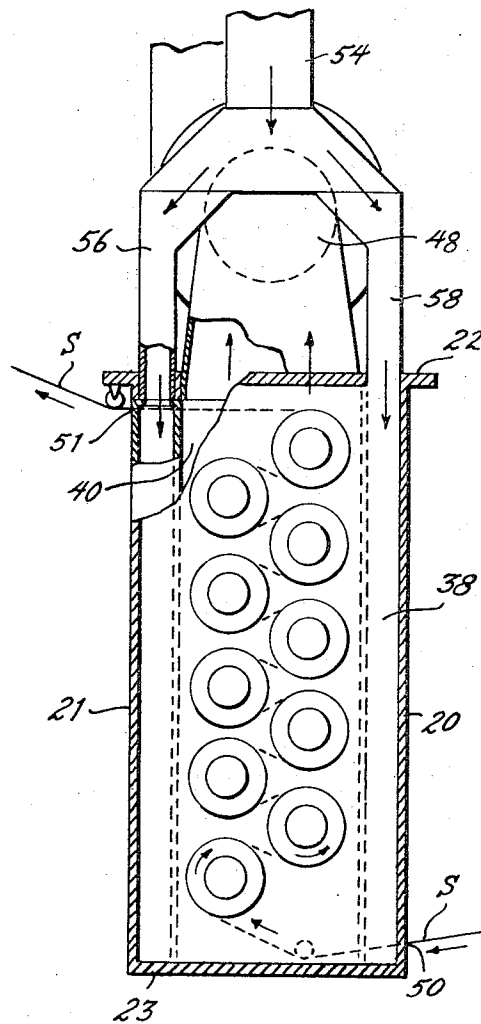


Fig. 4.

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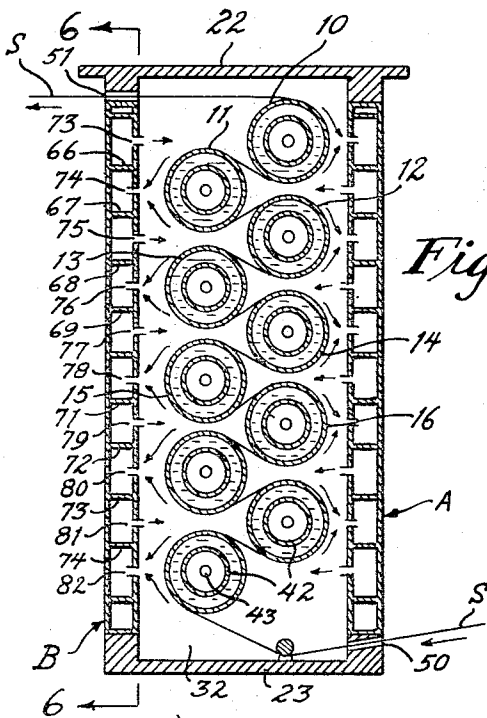


Fig. 5.

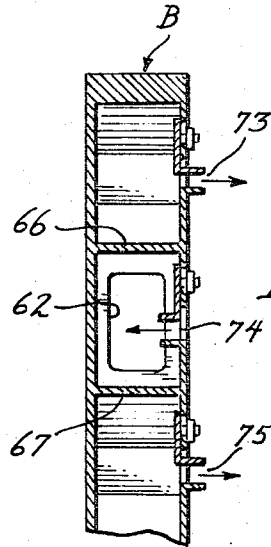


Fig. 7.

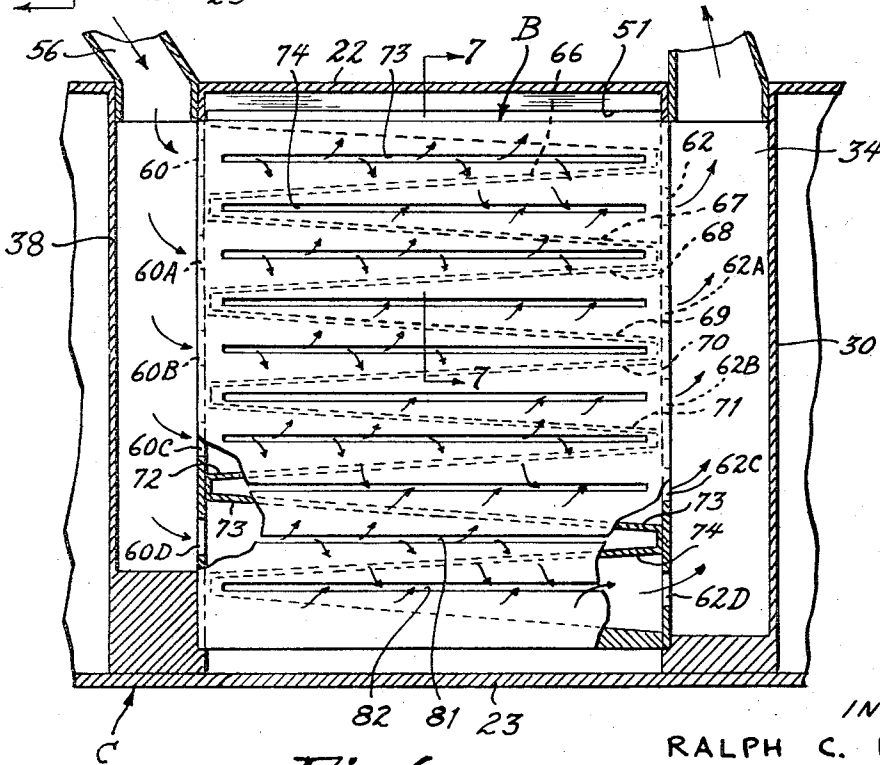
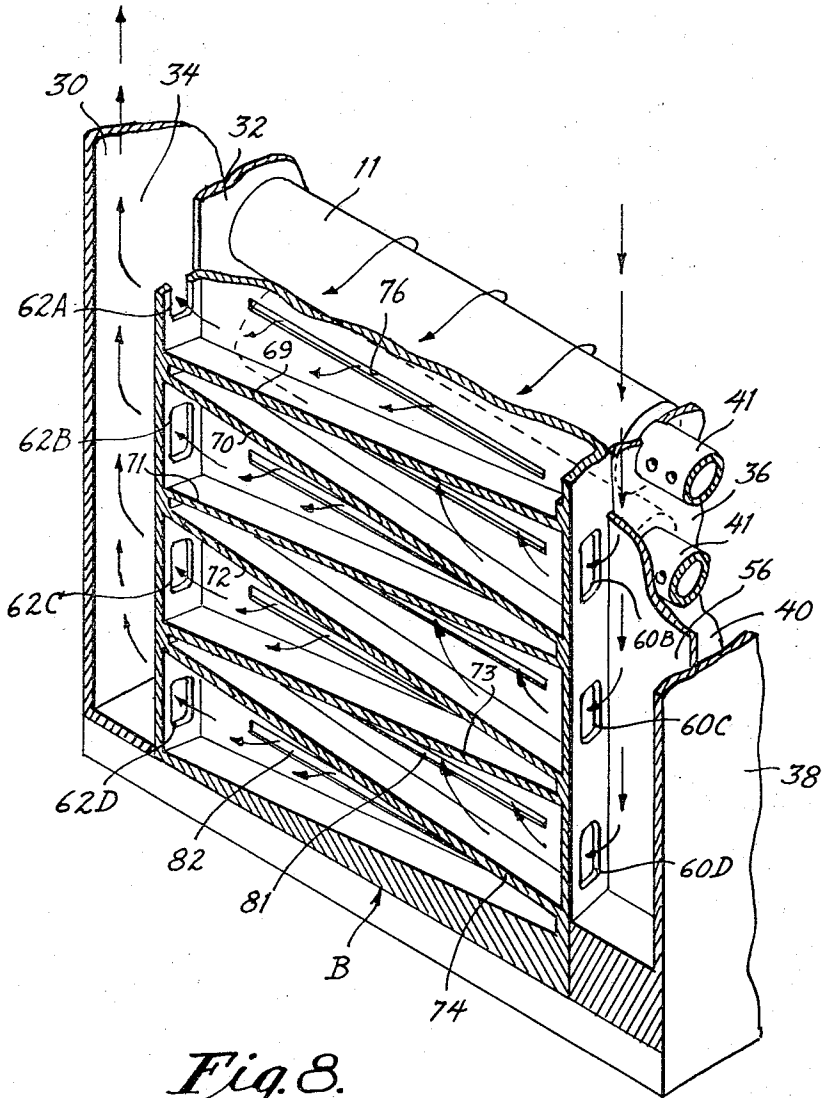


Fig. 6.

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*Fig. 8.*

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## MACHINE FOR HEAT TREATING SHEET MATERIAL

## THE BACKGROUND

Synthetic sheet material or natural sheet material treated with synthetic compositions, has to be dried and/or "set," or cured, or otherwise processed, in the presence of heat. This can be done by moving the sheet material in contact with one or more heated rolls such, for example, as the rolls shown in Roberts Pat. No. 2,488,937. The rolls are enclosed in a casing to conserve heat and to prevent dissemination of the fumes which are generated during the processing of the material.

## THE INVENTION

The invention resides in providing two improved, separate, exhaust systems: one for the gaseous products of combustion and one for the chemical fumes, and in introducing fresh air into the second system to dilute and to purge the fumes.

## IN THE DRAWINGS

FIG. 1 is a view, partly in elevation and partly in section, of a machine embodying the invention, the view being taken on line 1-1 on FIG. 2.

FIG. 2 is a horizontal sectional view looking in the direction of line 2-2 on FIG. 1.

FIG. 3 is a sectional view looking in the direction of line 3-3 on FIG. 1.

FIG. 4 is a sectional view looking in the direction of line 4-4 on FIG. 1.

FIG. 5 is a sectional view looking in the direction of line 5-5 on FIG. 1.

FIG. 6 is a sectional view looking in the direction of line 6-6 on FIG. 5.

FIG. 7 is a sectional view looking in the direction of line 7-7 on FIG. 6.

FIG. 8 is a fragmentary and somewhat diagrammatic, perspective view, showing details of construction.

As best shown in FIGS. 2, 4, and 5, the machine includes rolls 10, 11, 12, 13, 14, 15, 16, etc., which are enclosed in a casing C formed of end walls 18 and 19; sidewalls 20 and 21; and top and bottom walls 22 and 23. It will be noted that the inner ends of sidewalls 20 define a central opening which is closed by a removable subassembly A, and that the inner ends of sidewalls 21 define a similar opening which is closed by a similar removable subassembly B, FIG. 2. Subassemblies A and B are constructed to serve as part of the exhaust, as hereinafter described. At this point, it need only be noted that, they are removably mounted and that, when removed, subassemblies A and B provide access to the rolls and other internal surfaces. For this reason, and for brevity, they are hereinafter referred to as doors. It will be seen from FIG. 2 that the edges of doors A and B are beveled so as to fit tightly against beveled seats, as at 28.

At one end thereof, casing C is internally divided by partitions 30 and 32 which coact with adjacent walls 20 and 21 to form a vertical duct 34 which will be referred to further. At its opposite end, casing C is similarly divided by partitions 36 and 38 to form a duct 40 which encloses the perforated discharge ends 41 of the sleeves 42 which enclose burners 43 which heat the rolls. Burners 43 are supplied with gaseous fuel through manifold 44, and with combustion air through manifold 46 which is supplied by blower 47. Duct 40 is kept under negative pressure by means of a suction fan 48, or its equivalent. By this arrangement, the products of combustion, which are discharged into duct 40 are constantly evacuated to a point of disposal.

The sheet material S to be treated enters the casing as at 50 and, after travelling in contact with the rolls, it emerges as at 51, FIG. 4. The rolls are rotated about their axes by any suitable means such as the motor and sprocket chain drive 45 which is diagrammatically shown in FIG. 3.

In order to evacuate the fumes which are generated within the casing, I provide a duct 54 which, as shown in FIG. 4, divides to form two branch ducts 56 and 58. In the embodiment

illustrated, branch 56 communicates with the interior of door B, and branch 58 communicates with the interior of door A. Since the internal structure of the doors, and the manner in which they communicate with branch ducts 56 and 58 are the same, only one of them need be described in detail.

From FIGS. 4, 6, and 8, it will be seen that duct 56 communicates with the interior of door B through vertically spaced openings 60, 60A, 60B, 60C, and 60D, and that door B is provided with internal baffles 66, 67, 68, 69, 70, 71, 72, 73, and 74, which slant in opposite directions, as clearly shown in FIG. 8. By this arrangement, oppositely facing V-shaped compartments are formed with the mouths of the V facing openings 60, 60A, 60B, etc. For example, baffles 69 and 70 coact to form a V compartment with the mouth of the V facing opening 60B, and so on.

At its other end, door B communicates with duct 34 through openings 62, 62B, 62C, 62D. At this end, too, the baffles define oppositely flaring compartments, the mouths of which face in the direction of openings 62, 62A, 62B, 62C, etc. For example, baffles 70 and 71 form a V compartment, the mouth of which faces opening 62B and so on.

The compartments formed by the baffles as described, communicate with the interior of the casing through slots 73, 74, 75, 76, 77, 78, 79, 80, 81 and 82, which alternately conduct air into and out of the interior of the casing. For example, air from branch 56 entering through the lowermost opening 60D in FIGS. 6 and 8, will flow through slot 81 into the interior of the casing and will flow out of the casing through slot 82 to pass through adjacent openings 62D into duct 34 which is placed under negative pressure by suction fan 80.

It will be noted that "doors" A and B are in the nature of preassembled panels which, when in place, constitute the sides of the casing and establish a flow path between intake ducts 56 and 58 and exhaust duct 34.

I claim:

1. A machine for treating sheet material, said machine including:

- a casing having a sidewall;
- a heated rotary roll disposed in said casing for heat treating fume generating sheet material brought into contact therewith;
- said sidewall being hollow and having passages establishing communication between its interior and the interior of said casing;
- an air intake duct communicating with the interior of said sidewall at one end thereof; and
- an air exhaust duct communicating with the interior of said sidewall at the other end thereof, for withdrawing air and fumes from said casing.

2. The machine of claim 1 wherein said sidewall is detachably mounted so as to afford access to the interior of the casing.

3. The machine of claim 1 and means for creating negative pressure in said exhaust duct.

4. The machine of claim 1 wherein the interior of said sidewall is divided into compartments, each having a passage leading to the interior of the casing, and wherein said compartments are connected individually and in alternate order, with the air intake duct at one end thereof, and with the air exhaust duct at the other end thereof.

5. A machine for treating sheet material, said machine including:

- a casing having aligning openings therein;
- rotary rolls disposed in said casing for heat treating fume generating sheet material brought into contact therewith;
- sidewalls for closing said openings;
- said sidewall being hollow and being internally partitioned to form separate compartments;
- each compartment having a passage establishing communication between its interior and the interior of said casing;
- an air intake duct communicating with the interior of each of said sidewalls at one end thereof;

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a first air exhaust duct communicating with the interiors of said sidewalls at the other end thereof, for withdrawing air and fumes from said casing;

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combustion means for heating said rolls; and a second exhaust duct for removing the gaseous products of combustion.

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