Feb. 14, 1967 L. J. JANECEK 3,303,619

INDUSTRIAL OVEN WALL CONSTRUCTION

Filed Dec. 21, 1962 2 Sheets-Sheet 1

FIG. 3

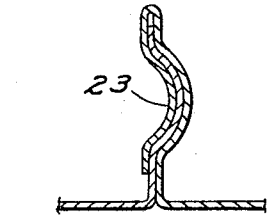
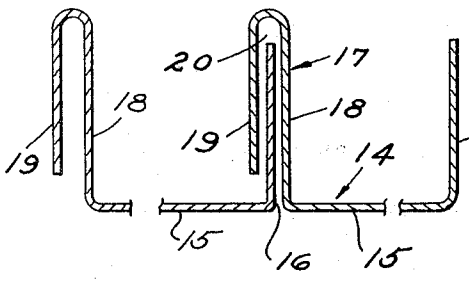


FIG. 2



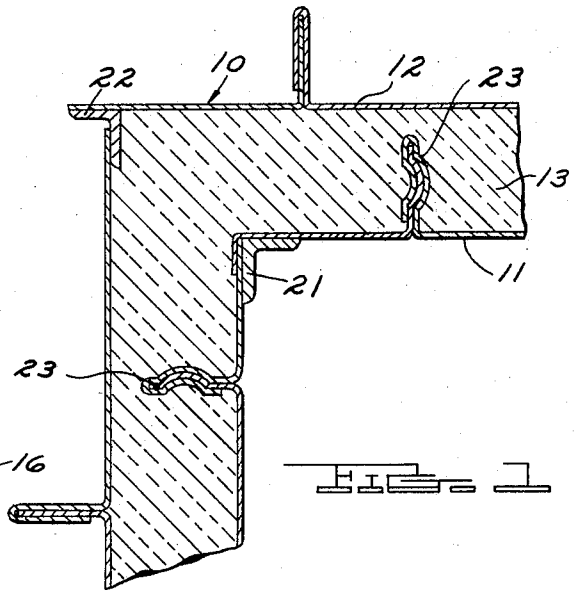
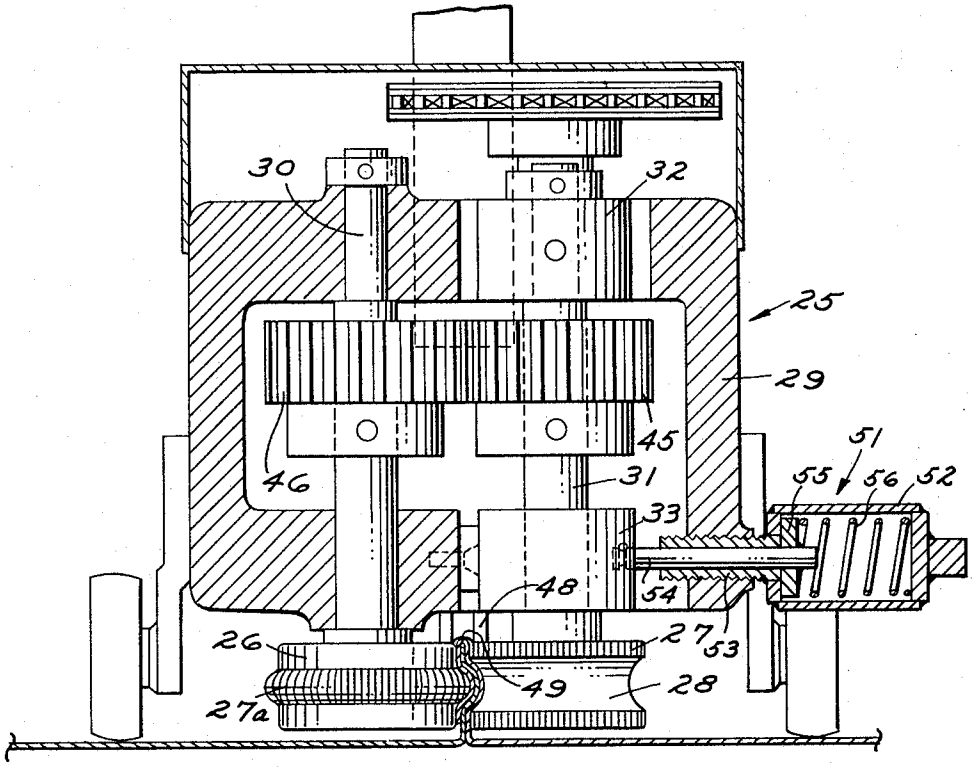


FIG. 1



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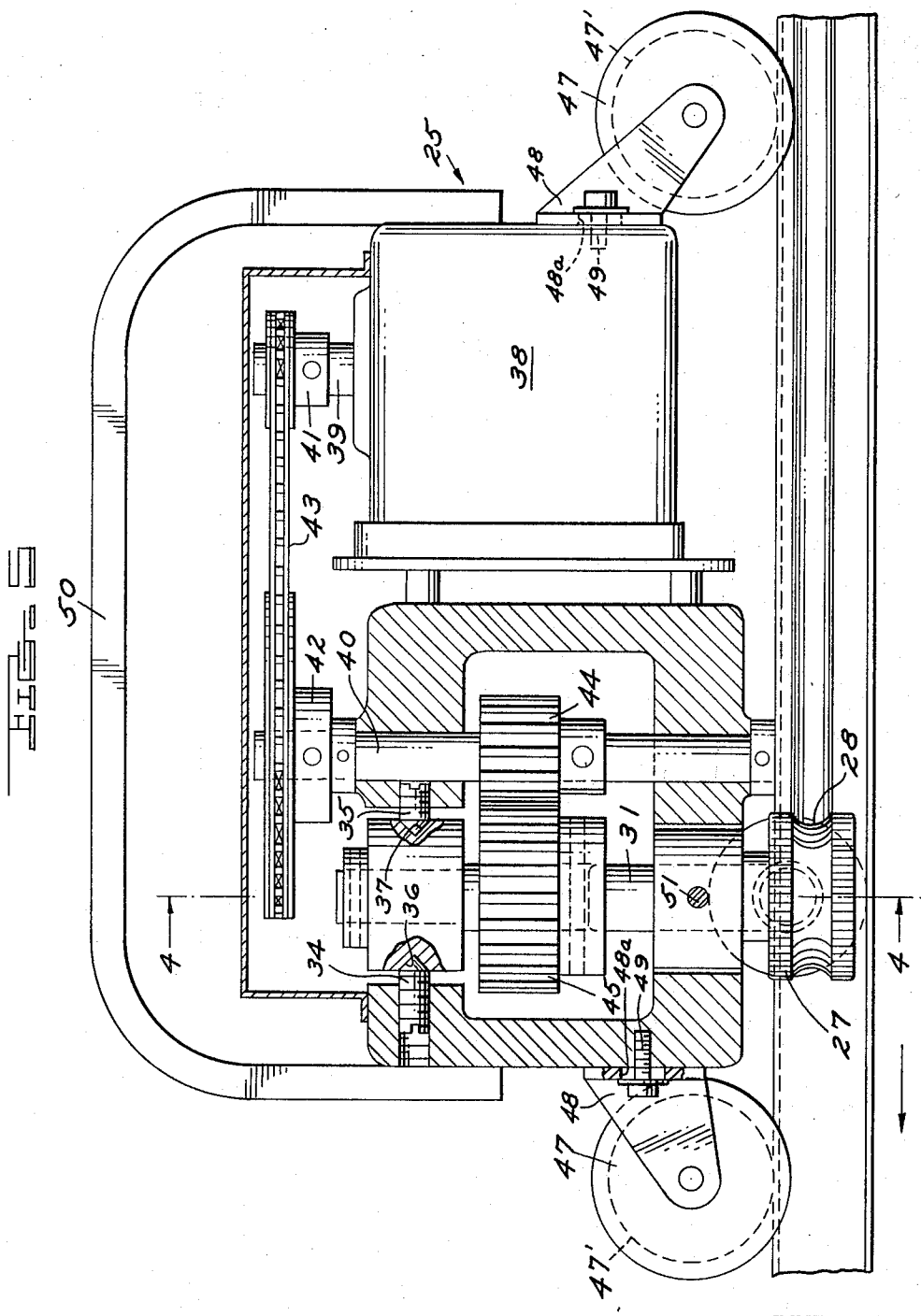
FIG. 4

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INDUSTRIAL OVEN WALL CONSTRUCTION

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2 Claims. (Cl. 52—303)

This invention relates to industrial oven wall construction and particularly to such a construction and the method and apparatus for producing the same.

In the manufacture of industrial ovens, a major problem is the permeation of vapor through the oven wall.

It is an object of this invention to provide an improved oven wall construction which is vapor impermeable.

It is a further object of the invention to provide a novel oven wall construction which is relatively inexpensive utilizing prefabricated sheet metal panels.

It is a further object of the invention to provide a novel oven wall construction using such panels wherein the vapor impervious joint is provided on the job during erection of the oven wall.

It is a further object of the invention to provide a novel method of providing a vapor impervious joint in an oven wall construction.

It is a further object of the invention to provide a novel apparatus for providing a vapor impervious joint in oven walls.

It is a further object of the invention to provide a novel vapor impervious joint.

It is a further object of the invention to provide a novel method of providing a vapor impervious joint.

It is a further object of the invention to provide a novel apparatus for providing a vapor impervious joint.

Basically, the invention comprises utilizing prefabricated sheet metal panels which have a flange along one side edge thereof and a reversely bent portion along the other side edge thereof which interengages the flange of the adjacent panel. In the novel oven wall construction, an inner wall is produced with such interengaging panels with the joint extending outwardly. The interengaging joints of the inner wall are then longitudinally crimped between rollers which are caused to travel along the length thereof on the wall and thereby provide the vapor impervious joint. The crimping is achieved by a novel apparatus which engages the joint and travels along the joint to crimp the joint. Insulating material is then provided along the outer surface of the inner wall and an outer wall of similar interengaging panels is erected.

In the drawings:

FIG. 1 is a fragmentary sectional view through a corner of an industrial oven embodying the invention.

FIG. 2 is a fragmentary sectional view showing the interengaging panels that are used.

FIG. 3 is a fragmentary sectional view showing the vapor impervious joint formed in the oven wall in FIG. 1.

FIG. 4 is a transverse sectional view of an apparatus taken along the line **4—4** in FIG. 5 for providing the vapor impervious joint showing the apparatus in operative position.

FIG. 5 is a longitudinal sectional view of the apparatus shown in FIG. 4.

Referring to FIG. 1, the oven **10** embodies an oven wall construction which includes an inner wall **11**, an outer wall **12** and insulating material **13** interposed between and outer walls **11, 12.**

The inner and outer walls **11, 12** are formed of identical interengaging sheet metal panels **14** each of which includes a central portion **15** which is generally flat and of uniform width throughout, a flange **16** bent at a right angle from the plane of the portion **15** along one longitudinal side edge of the panel **14** and a reversely bent portion **17** bent in the same direction as the flange **16** along the other longitudinal side edge of the portion **14.** The reversely bent portion **17** includes an outwardly extending flange **18** and a spaced inwardly extending flange **19** defining a space **20** into which the flange **16** of the adjacent panel extends (FIG. 2).

In assembling the oven wall, the inner wall **11** is first erected with the portions of the joint interengaging, as shown in FIG. 2, the insulating material **13** is then applied to the outer surface of the inner wall **11** and the outer wall **12** is then erected in position. It should be understood that braces are provided along the wall as may be required. This is shown, for example, at **21, 22,** in FIG. 1.

Before the insulation **13** is applied and the outer wall **12** is erected, the joints of the inner wall as defined by the interengaging flange **16** and reversely bent portions **17** are continuously longitudinally crimped intermediate their edges as at **23** (FIG. 3). This cold works the material and provides a vapor impervious joint. The crimping is achieved by the use of crimping rolls which have complementary surfaces in order to deform the material.

As shown in FIG. 4, the apparatus **25** for performing the crimping action in situ on the oven wall comprises complementary rolls **26, 27.** Roll **26** includes an annular bead **27***a* and roll **27** includes a complementary groove **28.** The rolls **26, 27** are driven in opposite directions and thereby cause the apparatus **25** to travel along the joint and crimp the joint.

As shown in FIGS. 4 and 5, apparatus **25** comprises a hollow frame **29.** A shaft **30** is journalled in the frame **29** and roll **26** is fixed on the lower end thereof. A shaft **31** is also mounted in the frame **29.** As shown, the shaft **31** is journalled in an upper journal **32** and a lower journal **33.** The upper journal **32** is, in turn, held in position by adjustable screws **34, 35** which engage conical depressions **36, 37** in the journal **32** to pivot shaft **31** in the frame.

The shafts **30, 31** are driven from an electric motor **38.** The shaft **39** of the electric motor is connected to an intermediate shaft **40** through sprockets **41, 42** and a chain **43.** The intermediate shaft **40** is coupled to the shaft **31** by a gear **44** on the intermediate shaft **40** which meshes with a gear **46** on the shaft **31.** Gear **46** on the shaft, **31,** in turn, meshes with a gear **45** on the shaft **30.**

In order to guide the movement of the apparatus **25** along the joint, guide rollers **47** are mounted on brackets **48** fixed on the ends of the frame **29.** The guide rollers are provided with grooves **47'** which engage the peak or crest of the joint and guide the apparatus along the joint. Each bracket **48** is provided with a slot **48***a* through which a screw **49** extends into frame **29** so that each roller is vertically adjustable. The brackets are preferably adjusted such that the angle of the axes of the shafts **30, 31** are inclined such that the rolls **26, 27** tend to travel inwardly toward the plane of the oven wall. This assists the apparatus in retaining the grip on the joint when it is used on a vertical as contrasted to a horizontal wall of the oven.

The apparatus is also preferably provided with a handle **50** which facilitates the placing of the apparatus into and out of position.

A spring loaded pressure screw assembly **51** is threaded into frame **29** and engages the lower journal **33** of shaft **31** to yieldingly urge the roll **27** against roll **26.** As shown in FIG. 4, screw assembly **51** comprises a housing **52** having a portion **53** threaded into frame **29.** A pressure member **54** is mounted within portion **53** and has a collar **55** thereon. A spring **56** is compressed between collar **55** and housing **52.** By this arrangement, if rollers **26, 27** encounter any discontinuity along flange **16** and

portion **17**, the rollers will pass over without breakage or bending of the apparatus.

When it is desired to use the apparatus **25**, it is brought into position and then the threaded shaft **31** is rotated to bring the roll **27** inwardly toward the roll **26**. As previously pointed out, the guide rollers are adjusted relative to the frame **29** preferably such that the planes of the rolls **26**, **27** extend downwardly toward the plane of the oven wall slightly in the direction of movement of the apparatus so that the rolls **26**, **27**, in effect, tend to "dig in."

It can thus be seen that there has been provided a novel oven wall construction, a novel method and apparatus for making the oven wall construction.

It can be appreciated that although the invention has particular utility when applied to an oven wall, it is also used in other wall constructions. It is believed that a novel feature of the invention is the provision of a wall by the use of pre-fabricated sheet metal panels and the making of the impervious joint in situ after the wall is erected.

I claim:

1. In an industrial oven wall, the combination comprising

an inner wall,

an outer wall spaced from the inner wall,

an insulating material interposed between the inner and outer wall,

each said wall comprising prefabricated panels of sheet metal including a central portion having longitudinal side edges,

a longitudinally extending flange bent from and extending along one side edge of the central portion,

and a reversely bent portion bent from and extending along the other side edge of the central portion into which the flange of the adjacent panel extends to define a joint,

the interengaging joints of the inner wall having a continuous uninterrupted longitudinal crimp intermediate the bend and the free longitudinal edge of the joint which is formed by continuously longitudinally crimping in place after the outer wall is assembled to cold work the interengaging flange and reversely bent portions and thereby provide a vapor impervious seal at the joints of the inner wall,

said joints of the outer wall being uncrimped to permit vapor to pass therethrough.

2. In a wall, the combination comprising

an inner wall,

an outer wall spaced from the inner wall,

an insulating material interposed between the inner and outer wall,

each said wall comprising prefabricated panels of sheet metal including a central portion having longitudinal side edges,

a longitudinally extending flange bent from and extending along one side edge of the central portion,

and a reversely bent portion bent from and extending along the other side edge of the central portion into which the flange of the adjacent panel extends to define a joint,

each said joint extending outwardly in the same direction, the interengaging joints of the inner wall having a continuous uninterrupted longitudinal crimp intermediate the bend and the free longitudinal edge of the joint which is formed by continuously longitudinally crimping in place after the inner wall is assembled to cold work the interengaging flange and reversely bent portions and thereby provide a vapor impervious seal at the joint of the inner wall,

said joints of the outer wall being uncrimped to permit vapor to penetrate therethrough.

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