

June 25, 1963

D. SONDY
CERAMIC KILN

3,095,186

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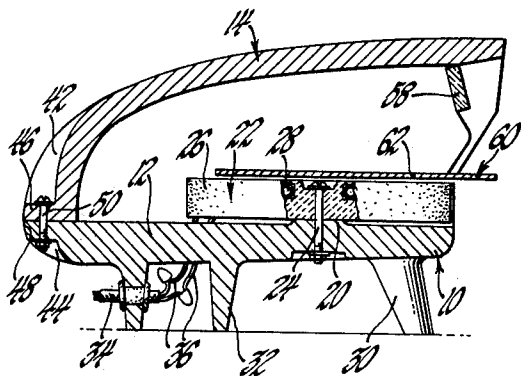


Fig. 1

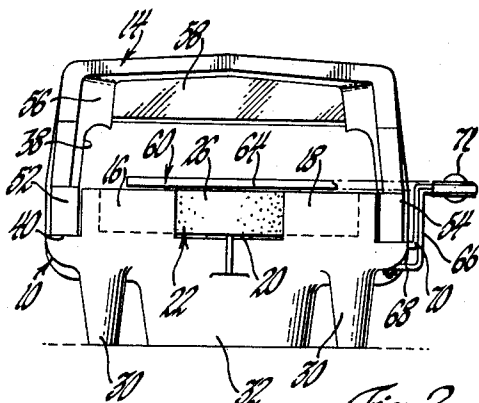


Fig. 2

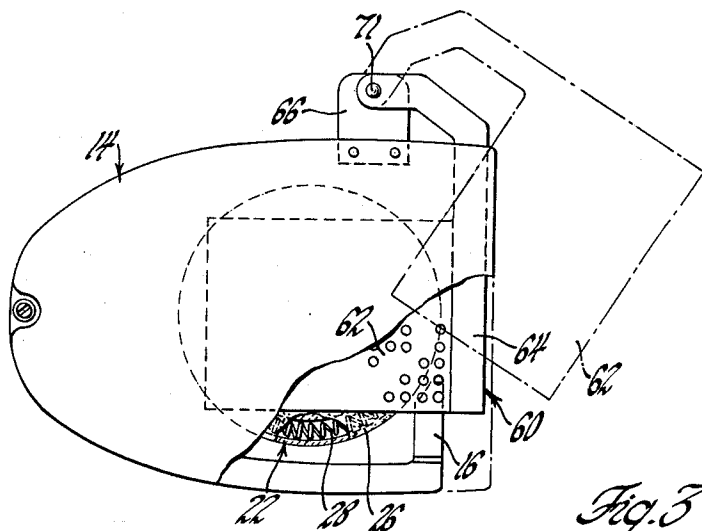


Fig. 3

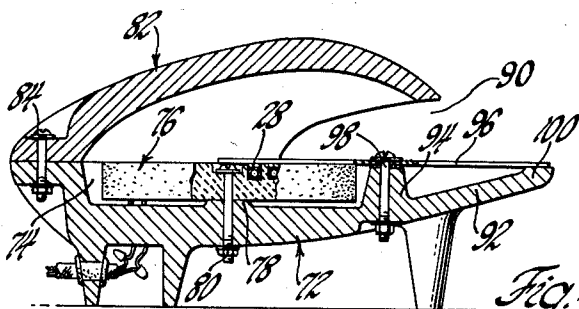


Fig. 4

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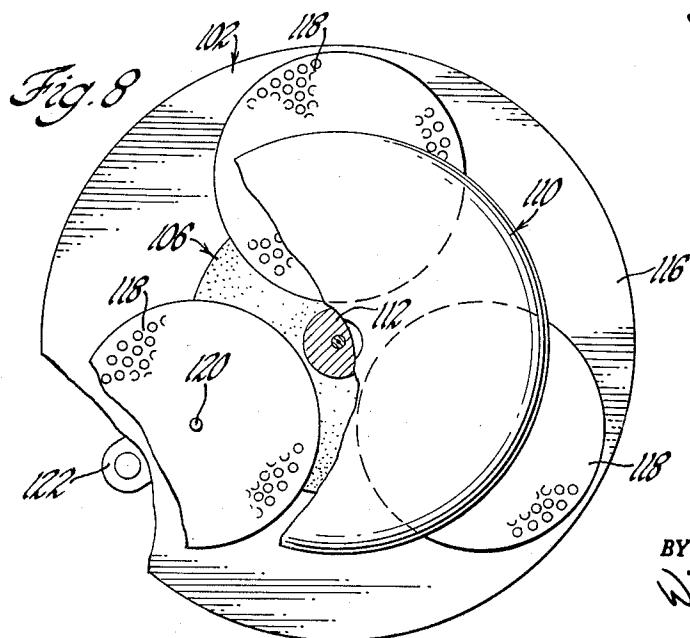
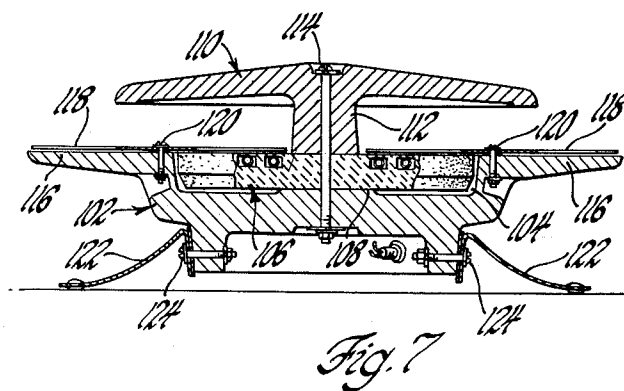
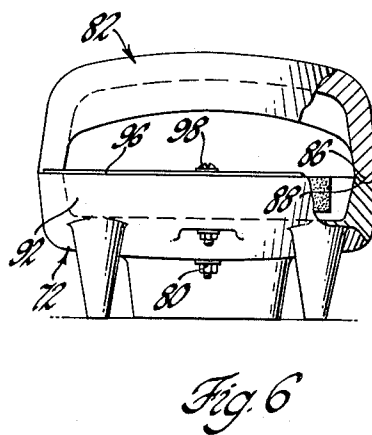
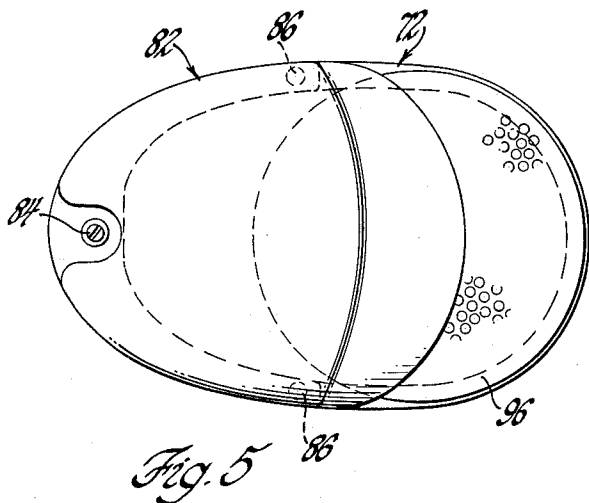
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CERAMIC KILN

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8 Claims. (Cl. 263-7)

The present invention relates to new and improved types of kilns adapted for use in firing ceramic or enamel coated objects. More specifically, the present invention relates to kilns which are constructed and arranged so as to provide more effective and less dangerous loading.

It is a further object to provide a uniquely constructed kiln which results in an attractive, easily assembled and economical design.

In the past it has been common practice with such enameling kilns for the user to insert the object within the oven by hand or to use some object to insert the same. The basic object of the present invention is to provide a kiln construction in which the objects to be fired are externally loaded on an object-carrying surface which is thereafter rotated or swung into position within the oven. In this manner, the user may work in a relatively cool, safe environment in loading and unloading the kiln.

In one form of the invention, the object supporting surface is mounted on an externally pivoted arm whereby the objects to be fired may be loaded externally and away from the heat of the oven.

In a second modification, a hooded and limitedly open front oven arrangement is combined with a turntable member such that approximately half of the turntable may be loaded and rotated into the oven for firing thereafter permitting the second half of the turntable to be loaded and rotated into firing position when the first batch of articles is finished.

A still further modification of the invention includes a centrally supported hood structure open on all sides which is adapted to coact with a plurality of turntables each of which may be externally half-loaded and rotated into position for firing.

In addition to the above general objects, it is a still further object of the present invention to provide improved structural details whereby all kiln modifications may be made simply and inexpensively.

The details as well as other objects and advantages of the present invention will be apparent from a perusal of the detailed description which follows.

In the drawings:

FIGURE 1 is a sectioned side elevation of the first modification of the subject invention;

FIGURE 2 is a front view of FIGURE 1;

FIGURE 3 is a partially broken away plan view of FIGURE 1;

FIGURES 4-6 are side, plan and front views, respectively, of a second modification of the subject invention; and

FIGURES 7 and 8 are sectioned elevational and plan views of a third modification of the subject invention.

In the past, enameling kilns have been bulky, relatively unattractive devices and somewhat hazardous to use. The present invention achieves an overall simplification of such kilns making them attractive, inexpensive and safer to operate.

The first modification is shown in FIGURES 1-3. A base member is indicated generally at 10 and includes an essentially flat upper surface 12 upon which the upper frame or hood member 14 is supported.

A pair of inwardly extending wedge-shaped locator members 16 and 18 are formed at the forward or front edge of base member 10. The wedge-shaped locating members perform two specific functions which will be described in greater detail in relation to the elements with which they coact.

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A boss member 20 is also formed on upper surface 12 of base 10 and centrally supports a heating element assembly 22 through a single stud member 24. Assembly 22 comprises a flat cylindrical casing member 26 within which heating element or elements 28 are adapted to be suitably imbedded or supported. Disposing the heating element within casing member 26 protects the same against damage or electrical shorting through dripping enamel or falling objects and at the same time provides an assembly which is easily removed for repair or replacement. If desired, element casing 26 may be air sealed to reduce oxidation of the heating elements.

Protective plate member 26 is naturally made of any suitable highly heat conductive material to insure maximum efficiency in conveying heat from the heating elements to the objects being fired.

Base member 10 is supported upon a pair of front legs 30 and a single enlarged rear leg 32. Leg 32 is hollow and is intended to provide a junction box through which a power line or wire 34 is supported for connection to heating element leads 36. Leads 36 extend from the heating element through suitable openings within base member 10.

It is to be noted that heating element assembly 22 is located toward the forward end or front of the kiln mainly for the purpose of easy viewing of the objects being fired through a window means to be subsequently described in greater detail.

Upper frame or hood member 14 is enclosed on three sides and provided with a relatively small front opening 38. Hood 14 includes a flat bottom or rim surface 40 adapted to seat upon upper surface 12 of base member 10.

Both base member 10 and hood member 14 are recessed at 42 and 44 thereof to provide flanges 46 and 48. A hole is provided through flanges 46 and 48 to receive a nut and bolt member 50 which is the sole means for securing hood 14 to base member 10.

The front portion of hood member 14 is properly aligned and prevented from swinging relative to base member 10 by having side walls 52 and 54 of the hood straddle the outer ends of locators 16 and 18. As best seen in FIGURE 2, a limited clearance is provided between the outer ends of locators 16 and 18 and hood side walls 52 and 54 to permit non-interfering expansion between the parts when the kiln is heated.

Thus, through the provision of a single nut and bolt member 50 in combination with the base locators 16 and 18 and hood side walls 52 and 54, a very simple assembly is provided which permits non-stressed expansion of the parts and at the same time permits easy disassembly of the kiln.

Referring particularly to FIGURE 1, it is to be noted that hood 14 inclines upwardly toward the front and terminates in a downwardly depending frame portion 56 which supports a Pyrex window 58. Frame 56 and window 58 are inclined rearwardly to permit the kiln user to observe the condition of the objects being fired within the oven without the necessity of periodically removing the objects and also avoiding the necessity of considerable bending.

An object supporting assembly is indicated at 60 and includes a perforated rack member 62 of a rectangular configuration as seen in FIGURE 3. Rack 62 is suitably secured at one end to an arm member 64 which is, in turn, pivoted to a bracket member 66. Bracket 66 includes a pair of angle members spaced at ends 68 and 70 to permit fastening to base 10. The other end of bracket 66 extends horizontally outwardly from base member 10 to permit arm 64 to be pivoted thereto through a pin or rivet 71. Thus rack 62 is supported as a cantilever from arm 64 and extends well within hood 14, as seen in FIGURE 1, so as to dispose the rack in superadjacent rela-

tionship to heating element assembly 22. To load or unload rack 62, arm 64 is rotated about its pivot 71 to move the rack exteriorly of the kiln permitting the user to work in a relatively cool and safe condition.

A second modification of the invention is shown in FIGURES 4 through 6. The general simplicity of the first modification is continued in the second modification and includes many of the same design features. In this case, base member 72 includes an enlarged recessed portion 74 formed in the upper surface thereof and within which heating element assembly 76 is adapted to be secured upon boss 78 through a single stud 80. Hood member 82 is similarly secured to base member 72 through a single nut and bolt member 84 at the rear ends thereof. The hood is located or positioned at the front by locator projections 86 which are adapted to extend within corresponding recesses 88 formed at the outer edge of base member 72. In this case also, hood 82 encloses three sides of the kiln leaving a relatively narrow opening 90 at the front thereof.

In this modification, the forward portion 92 of base member 72 projects beyond the forward edge of hood 82. A boss member 94 is formed in base member 72 forwardly of heating element supporting boss 78 and in turn rotatably supports a turntable 96 through a nut and bolt assembly 98. The forward portion 92 of base member 72 extends upwardly to provide a support surface or rim 100 for the exposed side of turntable 96 while the inner portion of the turntable may be slidably supported upon heating element assembly 76.

Thus, as viewed in FIGURE 4, approximately half of turntable 96 may be loaded with objects to be fired after which the turntable is rotated to position these objects within the kiln. At the same time, with half the turntable being used to position objects being fired within the kiln, the other half may be loaded with objects that may be rotated into firing position when the first batch is finished.

A third modification is shown in FIGURES 7 and 8 and provides a multiple turntable arrangement. In this instance, base member 102 includes a recessed central portion 104 within which a heating element assembly 106 is supported upon a boss member 108. A hood member 110 is centrally supported upon a depending column 112 to provide an umbrella-like hood configuration which permits access to the kiln through 360 degrees. A common nut and bolt assembly 114 is utilized to support both the heating assembly 106 as well as the hood assembly 110 to base member 102.

A turntable supporting flange 116 is formed on base member 102 and extends outwardly from the base beyond hood assembly 110. Flange 116 is adapted to rotatably support a plurality of turntables 118 thereon through stud assemblies 120. Here again, base flange 116 supports a portion of each turntable while the central heating element assembly 106 will slidably support the remaining portion thereof.

While illustrated with three turntables in FIGURES 7 and 8, it is apparent that the number of turntables actually used may be varied by varying the size of each turntable making them smaller to utilize more turntables or larger to use fewer depending upon the particular needs of the user.

A plurality of kiln supporting legs 122 are suitably secured to base member 102 through nut and bolt assemblies 124.

It is apparent that the modification of FIGURES 7 and 8 is such as to give the user maximum flexibility in simultaneously firing dissimilar objects and in fact permits more than one user to use the same kiln at the same time.

It is apparent that various structural variations may be made in the pivotal rack or turntable kilns shown within the intended scope of the hereinafter appended claims.

I claim:

1. A kiln apparatus for firing objects comprising a base member having an upper surface, a boss member formed on the upper surface of said base member, a heating element assembly, a single stud means for centrally supporting said heating element assembly upon said boss member and in substantially spaced relation to said base, a plurality of depending legs formed integrally with said base member for supporting the same, a hood assembly disposed in shielding relation over said heating element and adapted to at least partially enclose said base member, a single stud member for securing said hood member to said base member, object supporting means pivotally mounted upon said base member, said supporting means being rotatable between positions in which at least a portion thereof is disposed between said base member and said hood in heat exchanging relationship with said heating element assembly and another position in which at least a portion of said rack is disposed exteriorly of said hood member.

2. A kiln apparatus as set forth in claim 1 in which said object supporting means comprises a bracket extending laterally from the side of said base member, an arm pivotally secured at one end to said bracket member and adapted to extend across the open portion of said hood member, an elongated rack member secured at one end to the portion of said arm extending across said hood opening, said arm and rack being movable to a firing position in which said rack projects within said hood in superadjacent relation to said heating element assembly.

3. A kiln apparatus as set forth in claim 2 in which said hood assembly includes a frame portion depending from the front edge thereof to provide a partial closure for the front of said hood, and a window member mounted within said depending frame portion to permit viewing within said hood.

4. A kiln apparatus as set forth in claim 1 in which said base member includes generally vertically extending locator elements disposed at either side thereof, said hood member including side walls adapted to coact with said locator elements to align said hood member with said base member and also to prevent said hood member from being rotated relative to said base member.

5. A kiln apparatus as set forth in claim 1 in which said hood assembly coacts with said base member to provide a relatively narrow opening at the front of said kiln, said heating element assembly being disposed entirely within the space defined by said hood assembly and said base member, said base member including a portion extending beyond said kiln opening, a turntable member rotatably supported on said base member intermediate the heating element assembly and the extending portion of said base member, whereby a portion of said turntable projects exteriorly of said hood member while another portion extends within said hood member in heat exchanging relationship with said heating element assembly.

6. A kiln apparatus as set forth in claim 5 in which the extending portion of said base member includes a surface for supporting the portion of said turntable disposed exteriorly of said hood assembly, the portion of said turntable disposed within said hood assembly being slidably supported by said heating element assembly.

7. A kiln apparatus as set forth in claim 1 in which the hood assembly comprises an umbrella-like member centrally supported upon said base member, said heating element assembly being coaxially disposed in subadjacent and spaced relationship to said umbrella-like member, a single stud means for securing said umbrella-like member and said heating element assembly to said base member, and a plurality of turntable means supported upon said base member and circumferentially spaced so that portions of said turntable means are disposed beneath the umbrella-like member in heat exchanging relationship with said heating element assembly while other portions are disposed exteriorly of said umbrella-like member.

8. A kiln apparatus as set forth in claim 7 in which

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said base member includes a plurality of laterally extending flange portions extending radially beyond said umbrella-like member, said turntable means being supported upon said laterally extending flange portions of the base member.

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