Dec. 27, 1955 W. A. ELGETI 2,728,336

ASPHALT MASTIC KETTLES

Filed April 3, 1953 2 Sheets-Sheet 1

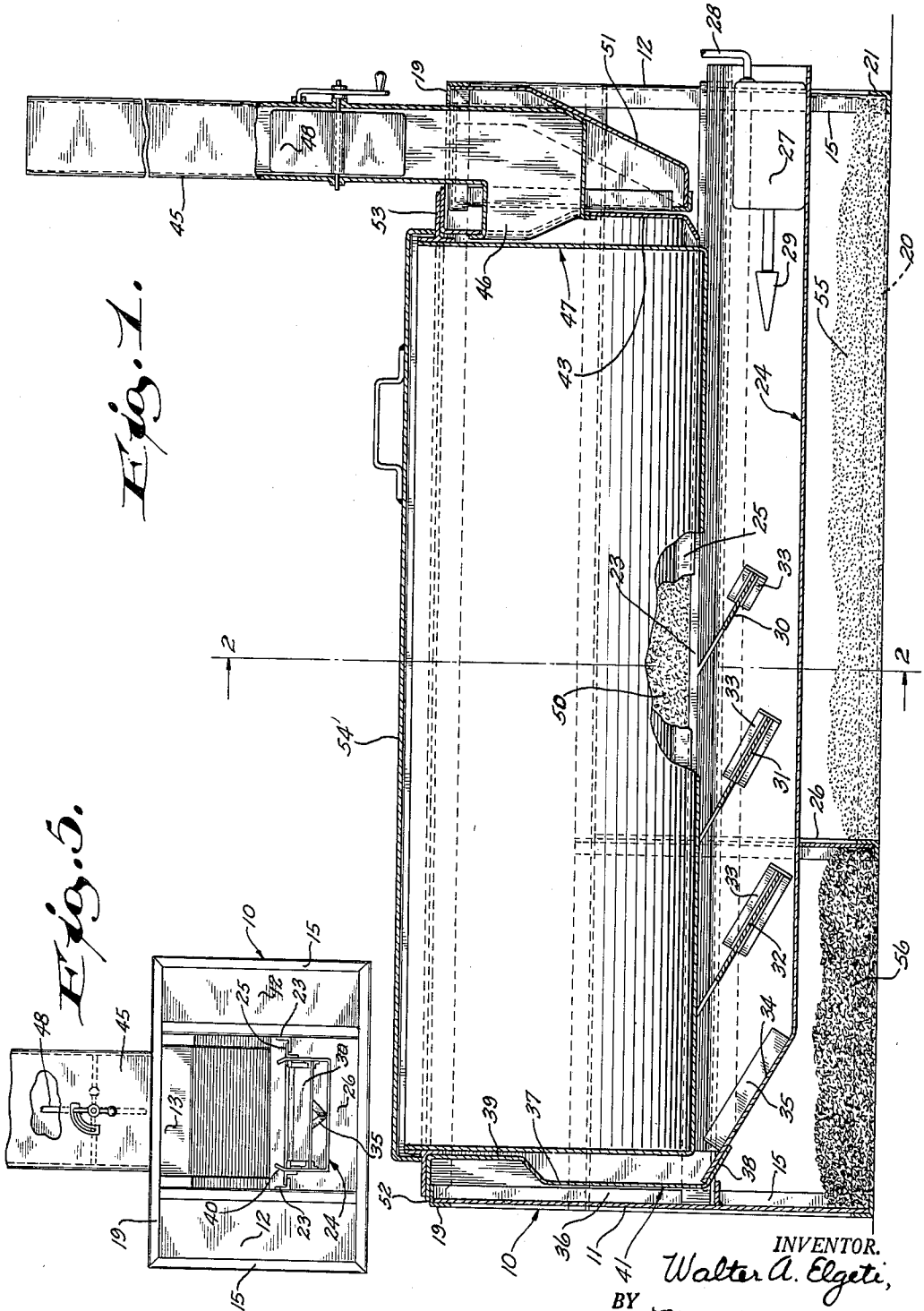


Fig. 1.

Fig. 3.

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Filed April 3, 1953 2 Sheets-Sheet 2

Fig. 2.

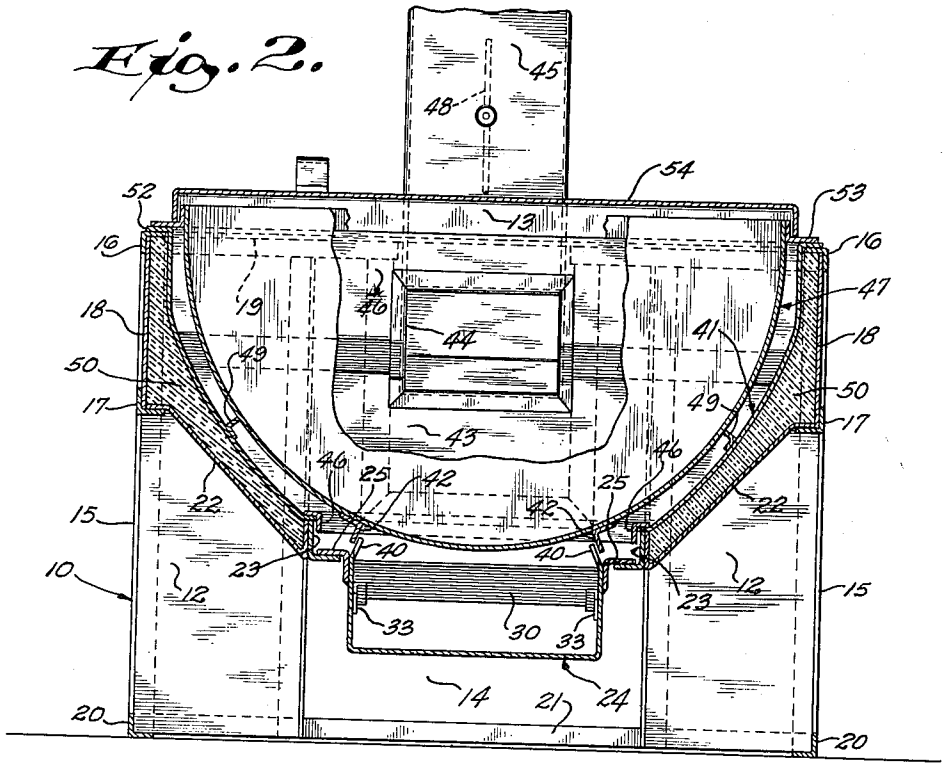


Fig. 3.

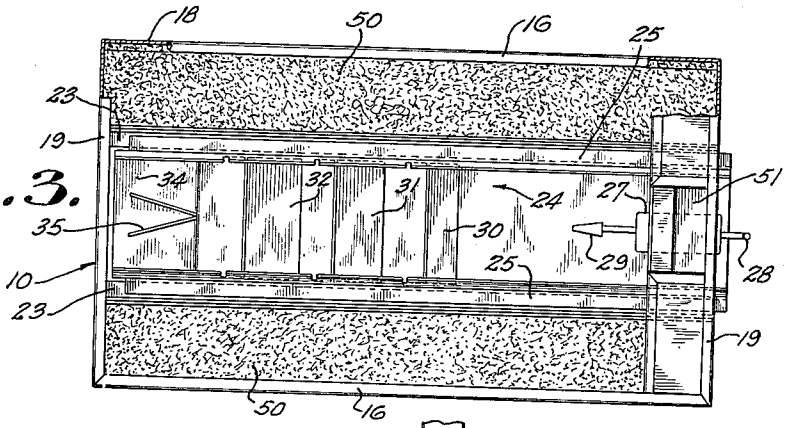
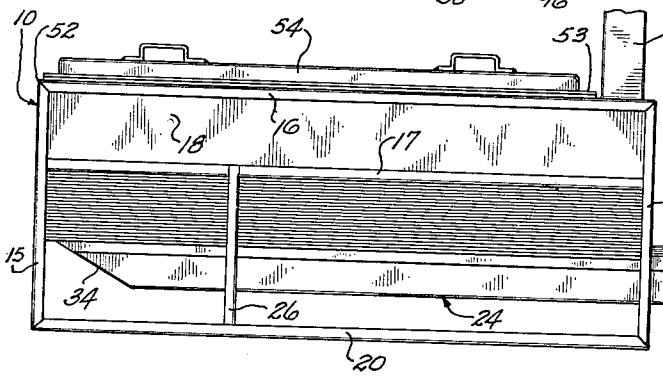


Fig. 4.



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ASPHALT MASTIC KETTLES

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6 Claims. (Cl. 126—343.5)

This invention relates to improvements in asphalt mastic kettles, and more particularly to an apparatus for efficiently and expeditiously heating into a molten, fluent condition, asphalt mastic composition ingredients preparatory to applying the same to a floor surface or the like.

According to conventional practices, in preparing a composition for a mastic floor or the like the asphalt mastic flooring material is applied to the surface and spread while the composition is in a molten fluent condition. Conventional present day practices in respect to preparing the flooring composition prior to its application are very crude and time consuming and involve the use of a heavy metal kettle ordinarily heated by a wood fire and into which the asphalt and flooring mixture are deposited and mixed and heated to a fluent condition.

It is also necessary to preheat a substantial amount of sand and granular granite which is ultimately mixed with the molten asphalt mastic material to give the latter the required body.

The present practice in respect to heating the asphalt mastic material and independently heating the sand and granite is extremely slow and time consuming, and is furthermore inefficient. Additionally, the wood fuel utilized applies heat directly to the bottom of the metal kettle with the result that the heat is localized and is not efficiently distributed to all interior surface portions of the kettle with the result that contents in the bottom portion of the conventional kettle will burn and cannot be used, and the burnt residue of the asphalt mastic composition must be periodically scraped from the bottom of a kettle.

With the above objects in mind, inherent in the conventional asphalt mastic kettles, a general object of the invention is to provide a practical and efficient type of asphalt mastic heating apparatus which eliminates the objections recited in connection with the conventional kettle by substantially reducing the heating period required, which permits the use of the entire contents of the kettle and which furthermore permits the preheating of sand and granite through the same heat source during the melting of the asphalt mastic composition.

A further object of the invention is to provide an improved asphalt mastic kettle or heater made up of a plurality of individually removable and replaceable sections, which also provide complete access to all of the parts of the assemblage for repairs, maintenance and cleaning.

A further object of the invention is to provide an asphalt mastic kettle which is heated by means of an air-oil burner, thereby affording controlled heat and which is furthermore arranged with heat confining and directing ducts, passages and baffles to efficiently distribute heat to all portions of the upper pot member which contains the asphalt and mastic composition.

A further object of the invention is to provide an asphalt mastic kettle wherein the outer walls of the main supporting and enclosing frame are separated from the inner pot and heat conducting channels by insulation to prevent the dissipation of heat to the exterior of the apparatus permitting workmen to stand adjacent the apparatus with comfort.

A further object of the invention is to provide an asphalt mastic kettle wherein the portions which are subjected to the greatest heat and are therefore susceptible of being burned out, are readily removable and replaceable.

A further object of the invention is to provide an asphalt mastic kettle which is relatively inexpensive to manufacture and operate, which is compact and provides ready accessibility to all portions thereof, which is neat and attractive in appearance, which is strong and durable, and which is well adapted for the purposes described.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a longitudinal vertical sectional view through the improved asphalt mastic kettle, with additional portions broken away;

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a plan view on a smaller scale of the kettle with the cover and pot unit removed, portions being broken away and in section;

Fig. 4 is a side view of the kettle assemblage on a smaller scale; and

Fig. 5 is an end view of the kettle assemblage with a portion of the flue or chimney broken away and with the air-oil burner removed from the lower tube, said view also being on a reduced scale.

Referring now more particularly to the drawings it will appear that the main frame of the assemblage is indicated generally by the numeral 10 and the same includes a solid end wall 11 and, at the opposite end of the structure horizontally spaced apart end wall sections 12. With respect to the latter there is a top flange 13 joining the upper portions of the end wall sections 12 but leaving therebelow a rectangular opening 14 (see Figs. 2 and 5). The side margins of the end wall 11 and the outer side margins of the end wall sections 12 are secured to vertical angle iron legs 15 to which are also affixed, on opposite sides of the main frame, upper and intermediate longitudinal angle iron rails 16 and 17 to which are welded upper side plates 18. Transversely of the main frame at the upper ends thereof are end frame angle irons 19 to which are welded the upper margins of the end plates 11 and 12. Secured to the bottoms of the upright corner posts 15 are longitudinal and transverse bottom angle iron rails 20 and 21 respectively. The lower horizontal margins of the end plates 11 and 12 are welded or otherwise secured to the bottom rails 21.

Within the main frame 10 intermediate the top and bottom thereof and extending from lower marginal portions of the side walls 18 downwardly inwardly, with their upper margins secured to and supported on said longitudinal angle iron rails 17 are walls 22 (see Fig. 2) whose adjacent inner lower margins are substantially spaced apart and are secured to inner longitudinal angle members 23 which form supporting tracks for slidably receiving the horizontal side flanges 25 on the upper side portions of a removable lower tube generally indicated by the numeral 24 and which will be described in more detail hereinafter.

At this point it may be stated, however, that said lower tube 24 which is substantially U-shaped in cross section, when in normal position closes the space between the lower inner margins of the inclined walls 22 and projects slightly outwardly of the opening in the right hand end wall (relative to Fig. 1) between the end wall sections 12.

The numeral 26 indicates a transverse partition which separates the space within the lower open portion of the main frame 10 below the lower tube 24 and inclined walls 22. The top margin of said transverse partition 26 is

angular at its upper outer margins to conform with and engage the bottom portions of the inclined walls 22, and intermediately, said partition has a U-shaped opening therein to accommodate the lower tube 24.

It will be observed from Figs. 1 and 3 that the forward end of the lower tube 24 has mounted therewithin one or more conventional air-oil burners 27 supplied with liquid fuel from any convenient source by a pipe 28. The nozzle 29 of said air-oil heater 27 projects horizontally forwardly into the interior of the U-shaped lower tube 24 and when the heater is in operation an intense flame is projected horizontally with considerable velocity within the tube 24 with the heated-air gas mixture passing below and being deflected by a series of inclined transverse baffles 30, 31 and 32 which are slidably removably engaged at their edge portions by slotted brackets 33 secured on opposite inner side wall portions of the tube 24. It will be observed, particularly from Fig. 1 that toward the inner end of the lower tube 24 the baffles 30, 31 and 32 are progressively longer with less space between the lower edges thereof and the bottom wall of the lower tube. The bottom of the inner end of the lower tube is inclined upwardly, as at 34 and carries on its inner surface a V-shaped baffle or deflector 35.

At the inner or left hand end of the interior of the main frame 10 (relative to Fig. 1) and spaced by vertical angle members 36 is the inner end wall 37 of a cradle shaped upper tube 41. Said wall 37 has a downwardly inclined transverse lower portion 38 which is overlapped by the upper edge portion of the inclined end wall 34 of the lower tube 24 when the latter is in its innermost operative position, as shown in Fig. 1. The upper portion 39 of said end wall 37 is flared inwardly, which, as will appear, restricts the upward passage of heat. The opposite or forward end wall 43 of the cradle like upper tube 41 has a relatively centrally located rectangular opening 44 therein within which is secured the angular lower end portion of an upwardly extending chimney or exhaust pipe 45. Above the chimney entrance opening 44 said end wall 43 is flared inwardly as at 46 for duct restricting purposes. The curved bottom portion of the cradle shaped upper tube 41 is formed with a longitudinal opening therein and secured along the longitudinal margins of said opening are angle iron members 46 which engage over the upper edges of the main frame carried angles 23. It should be stated that the cradlelike upper tube 41 with the attached exhaust pipe or chimney 45 is an integral unit which removably seats in the main frame 10 as shown, being spaced from certain wall portions thereof by the angle members described.

Said cradlelike upper tube 41 provides an enclosure for a removable cradle shaped pot designated generally by the numeral 47 which is normally disposed within the upper tube 41 in the manner shown in Figs. 1 and 2, so that a substantial area of the curved bottom of said pot registers with and substantially closes the rectangular opening in the bottom of the upper tube 41. Thus, the bottom of the pot is directly subjected to the hot gases flowing through the lower tube 24 and being deflected by the baffles 30, 31 and 32. On the curved bottom of said pot 47, in spaced-apart relation so as to fit exteriorly of the lower tube top flanges 40 are angle members 42. Hence, between the angle members 23 and the respective flanges 40 and angle members 42 there are defined fluid return ducts, and also between the upper peripheral body portions of the upper tube 41 and the pot 47 there are spaces which provide for the return of the heating fluid along all side portions of the pot. The returning heating fluid exhausts into the space between the forward wall 43 of the upper tube and the adjacent end wall of the pot and eventually is discharged to the atmosphere through the chimney or exhaust pipe 45 which may be controlled by a suitable damper 48 therein. The inner side wall portions of the upper tube 46 may also carry longitudinal angle members 49 which serve to maintain the spaced relation between the adjacent wall portions of the pot and upper tube. It should also be stated that the space between the adjacent side wall portions of the upper tube 41 and the wall portions 22 and 18 of the main frame is packed with insulating material 50, preferably rock wool, to prevent the dissipation of heat to the outside of the structure.

With particular reference to Fig. 3, it will be observed that the right hand end of the main frame member 10 has an inwardly extending frame structure providing a recess 51 to snugly vertically removably receive the angular lower end portion of the flue or chimney 45 which extends to the adjacent end wall 43 of the upper tube.

The upper margin of the upper tube 41 is formed with an angular flange 52 which seats on the angles 19 and 16 at the top of the main frame. Similarly the upper peripheral portion of the pot 47 is formed with a horizontally extending flange 53 which seats on the upper tube flange 52. When the kettle is in operation and the pot 47 is filled with material being cooked or melted, the open upper end of the pot may be kept closed by a removable cover 54 having downturned peripheral flanges which seat on the pot flanges 53.

The improved asphalt mastic kettle or heating apparatus is, of course, portable and may be transported by truck in either an assembled or disassembled condition to the point of operations. There, with a single source of heat the asphalt mastic flooring composition, as well as the required sand and granite can all be heated and prepared simultaneously in a fraction of the time required with the conventional metallic kettle and wood fire. The lower tube 24, which contains the air-oil burners 27 has its side and bottom wall portions exposed, and initially a large body of sand 55 is shoveled into the open framework to the right of the transverse partition 26 (relative to Fig. 1) to a degree to cover the bottom and sides of the adjacent portion of the metallic lower tube 24. Similarly on the other side of the transverse partition 26 granite 56 is shoveled into the space into contact with the exposed portions of the remaining sections of the lower tube 24. The sand and granite, as thus disposed, prevent excess dissipation of heat from the lower tube 24 and said material is thoroughly preheated by the hot gases flowing through the tube 24 when the burner 27 is in controlled operation.

Additionally, it will be evident that the cover 54 of the pot 47, when removed, permits the interior of the pot to be filled with the asphalt mastic composition which is to be cooked or heated to a fluent mixed condition. The heating of the material in the pot is accomplished extremely efficiently and relatively expeditiously because the structure provides for efficient heat transfer along all major surface portions of the confined and insulated inner pot 47. The hot heating gases are initially discharged from the nozzle 29 horizontally with considerable velocity and are projected the length of the lower tube 24, and during the course of travel the various baffles 30, 31 and 32 deflect portions of the stream into more intimate contact with the bottom portion of the pot 47 which projects through the longitudinal opening in the upper tube 41. At the left hand end of the structure relative to Figs. 1 and 3 the hot gases then rise in the duct between the wall 37 and the adjacent end wall of the pot, and then are permitted to return toward the exhaust end of the structure in the passages defined by the various angles and flanges and in the spaces between the curved side walls of the members 41 and 47 shown most clearly in Fig. 2. At the forward or exhaust end of the structure these gases then enter the space between the forward end walls of the members 41 and 47 and exhaust into the damper controlled chimney or exhaust pipe 45 through the opening 44. It, of course, will be appreciated that the degree of heat supplied by the air-oil heater 27 is subject to control.

In structures of this type wherein a high degree of heat

is required it may, eventually, be necessary to replace some of the metallic parts. In the present structure the portions which are subjected to the greatest degree of heat and which may, consequently, eventually burn out are the lower tube **24** and the baffles therein. It will readily be appreciated that the improved structure makes it extremely simple to replace such parts. It is merely necessary to slide the lower tube **24** out of the opening at the right hand end of the structure (relative to Fig. 1), whereupon the baffles may be removably disengaged from their supporting brackets **33** and replaced, or, if desired, the entire unit **24** may be replaced.

It is also evident that other portions of the assemblage are complete units in themselves susceptible of being removed for inspection, cleaning or repairs. The pot **47** may, of course, be bodily removed from the cradlelike upper tube **41** within which it is disposed, and similarly the upper tube **41** with the attached chimney or flue pipe may be bodily removed from the main supporting frame **10**. In the latter event the insulating material **50** may be readily replaced or repacked. Preferably the pot **47** and the lower tube **24** and baffles are formed of heavy boiler plate steel to resist deterioration from excessive heat.

The efficient manner in which the improved asphalt mastic heating apparatus functions results in the proper heating and cooking of the contents of the pot **47** with the result that none of the contents of the pot is likely to burn up or deteriorate during the heating process so that the entire contents of the pot may be used without waste and there will be no residue necessitating scraping of the interior wall portions of the pot. The preheating of the sand and granite is accomplished simultaneously with the heating of the asphalt mastic mixture by means of the same source of heat.

The improved asphalt mastic kettle is of simple sectional construction, is easy to use and operate, and processes the contained material with a substantial saving of time, and is well adapted for the purposes set forth.

What is claimed as the invention is:

1. A mastic cooker, comprising a main frame open along its lower side portions and having an intermediate floor therein inclined on both sides toward its longitudinal median, there being a relatively wide intermediate, longitudinally extending slot in said floor, an open top primary heating metallic conduit removably mounted below said floor and extending longitudinally thereof in registration with said slot, a fluid fuel burner discharging into said primary conduit, the space within said frame below the primary heating conduit being adapted to hold granular material to be heated by said primary conduit, an open top intermediate cradle member seated within the upper portion of said main frame and having a longitudinal opening in its bottom registering with the longitudinal opening in the frame floor and also having an exhaust opening in a wall, insulation between adjacent portions of the main frame and intermediate cradle member, and a cradle-shaped cooking pot spacedly seated within said intermediate cradle member and having its bottom in registration with the longitudinal openings in the main frame floor and intermediate cradle member, the spaces between the intermediate cradle member and pot being in communication with said primary heating conduit and said exhaust opening.

2. A flooring composition cooker, comprising a main frame having an intermediate, centrally tapered floor with a longitudinal slot in the central portion of said floor, said frame having upper side closures, a closed end and an apertured end, a primary heating conduit of U-shape in cross-section longitudinally slidably engaged with the marginal portions of said floor adjacent the opening and depending therefrom, said heating conduit being slidable through the aperture in the end wall for disengagement from the main frame, a fluid fuel burner discharging into an end portion of said primary conduit, an intermediate cradle member removably seated within the upper portion of said main frame and having a longitudinal opening in its bottom registering with the longitudinal opening in the frame floor, an exhaust pipe opening through an end wall portion of said intermediate cradle member adjacent the end of the primary heating conduit into which the burner discharges, and a cradle-shaped cooking pot removably, spacedly nested within said intermediate cradle member and having its bottom in registration with the longitudinal opening in the main frame floor and intermediate cradle member, the bottom of said pot being heated directly by heating fluid flowing through said primary heating conduit.

3. A flooring composition cooker, comprising a main frame having an intermediate, centrally tapered floor with a longitudinal slot in the central portion of said floor, said frame having upper side closures, a closed end and an apertured end, a metallic, open top primary heating conduit longitudinally slidably removably engaged with the marginal portions of said floor adjacent the opening and depending therefrom, said heating conduit being slidable through the aperture in the end wall of the main frame, baffles within said primary heating conduit, a fluid fuel burner associated with and discharging into an end portion of said primary conduit, an intermediate metallic cradle member removably seated within the upper portion of said main frame and having a longitudinal opening in its bottom registering with the longitudinal opening in the frame floor, an exhaust pipe opening through a wall portion of said intermediate cradle member, and a cradle-shaped metallic cooking pot removably nested within said intermediate cradle member and spaced from the walls thereof, the bottom of said pot registering with the longitudinal openings in the frame floor and intermediate cradle member.

4. A mastic cooker, comprising a main frame open along its lower side portions and having an intermediate floor therein inclined on both sides toward its longitudinal median, there being a relatively wide intermediate, longitudinally extending slot in said floor, an open top primary heating conduit removably mounted below said floor and extending longitudinally thereof in registration with said slot, a fluid fuel burner discharging into said primary conduit, the space within said frame below the primary heating conduit being adapted to hold granular material to be heated by said primary conduit, an open top intermediate cradle member seated within the upper portion of said main frame and having a longitudinal opening in its bottom registering with the longitudinal opening in the frame floor and also having an exhaust opening in a wall, insulation between adjacent portions of the main frame and intermediate cradle member, a cradle-shaped cooking pot spacedly seated within said intermediate cradle member and having its bottom in registration with the longitudinal openings in the main frame floor and intermediate cradle member, longitudinal ribs between adjacent wall portions of the intermediate cradle member and pot, the spaces between the intermediate cradle member and pot being in communication with said primary heating conduit and said exhaust opening, and a cover removably closing the top of said pot.

5. A flooring composition cooker, comprising a main frame having an intermediate, centrally tapered floor with a longitudinal slot in the central portion of said floor, said frame having upper side closures, a closed end and an apertured end, a primary heating conduit of U-shape in cross-section longitudinally slidably engaged with the marginal portions of said floor adjacent the opening and depending therefrom, said heating conduit being slidable through the aperture in the end wall for disengagement from the main frame, said primary heating conduit having staggered, inclined, removable baffles therein, a fluid fuel burner mounted in the end of the primary conduit adjacent the apertured end of the main

frame to discharge into said primary conduit, an intermediate cradle member removably seated within the upper portion of said main frame and having a longitudinal opening in its bottom registering with the longitudinal opening in the frame floor, an exhaust pipe opening through an end wall portion of said intermediate cradle member adjacent the end of the primary heating conduit into which the burner discharges, and a cradle-shaped cooking pot removably nested within said intermediate cradle member and spaced from side and end walls thereof, the bottom of said pot registering with the longitudinal openings in the frame floor and intermediate cradle member and being heated directly by heating fluid flowing through said primary heating conduit.

6. In an asphalt mastic cooker, a main frame having an intermediate centrally inclined floor with a longitudinal slot along its longitudinal median, tracks carried by said main frame adjacent its longitudinal slot, an open top cradle member and a cooking pot nested within the upper portion of the main frame in spaced relation so as to provide heating fluid ducts between adjacent bottom and side wall portions of the cradle and pot, a U-shaped elongated primary heating conduit formed with flanges along its upper longitudinal margins, said flanges being

engaged by the main frame tracks whereby said heating conduit is slidably depended from the main frame below the opening therein, said heating conduit also containing a source of heat, the bottom of the cradle having a longitudinal opening therein registering with the opening in the main frame which opening is covered by the bottom portion of the pot to subject said portion of the pot to direct contact with heating fluid passing through the primary conduit.

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