July 4, 1961 E. C. CAUFIELD 2,990,755

HEATED ASPHALT ROLLER DEVICE

Filed Jan. 26, 1959 2 Sheets-Sheet 1

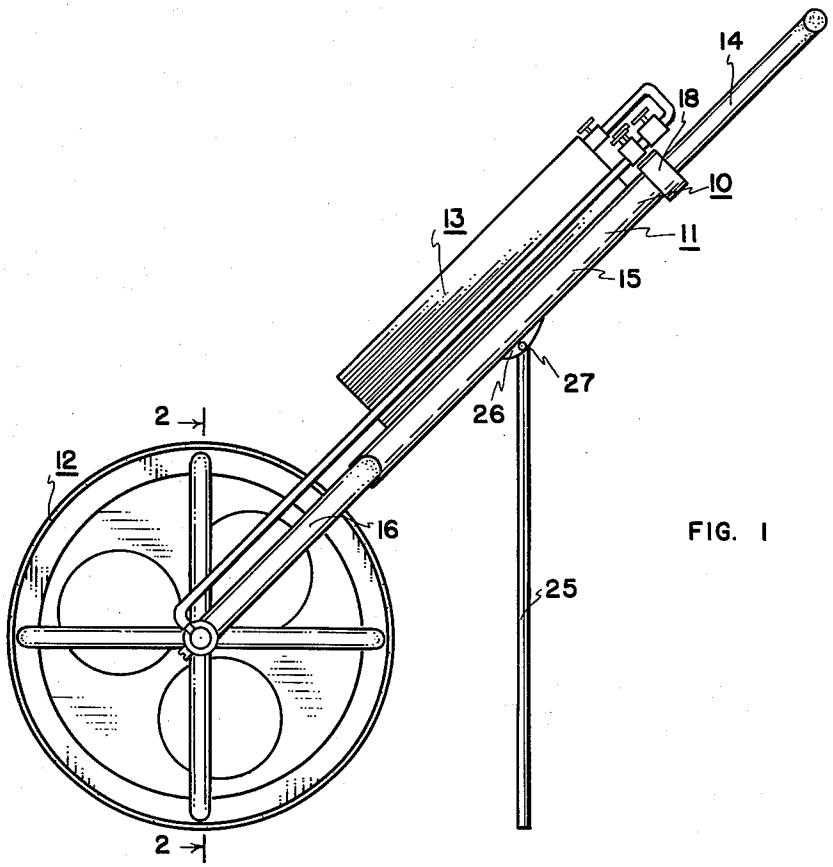


FIG. 1

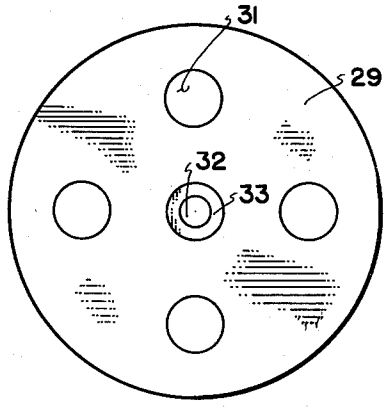


FIG. 3

INVENTOR.
EDWARD C. CAUFIELD
BY M. Ralph Shaffer
HIS ATTORNEY

July 4, 1961 E. C. CAUFIELD 2,990,755

HEATED ASPHALT ROLLER DEVICE

Filed Jan. 26, 1959 2 Sheets-Sheet 2

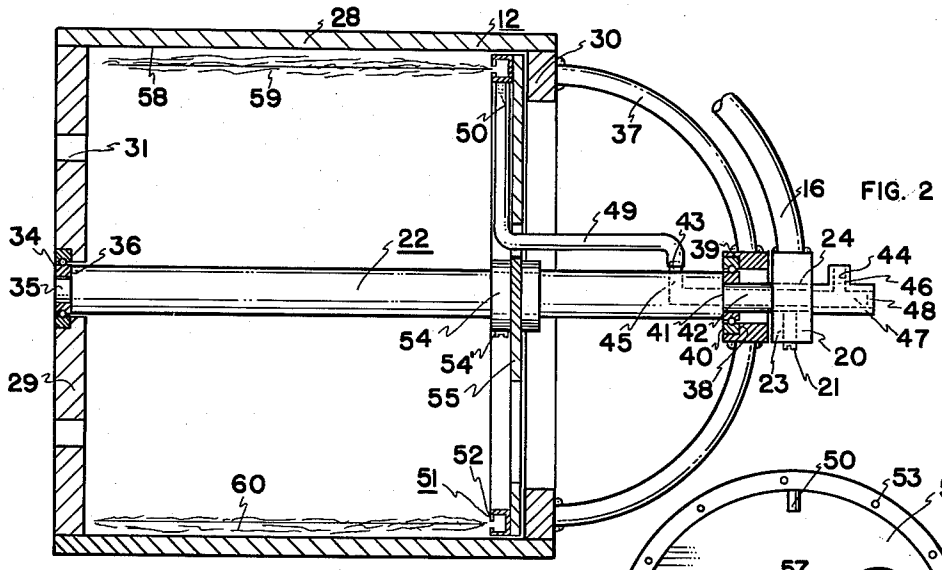


FIG. 2

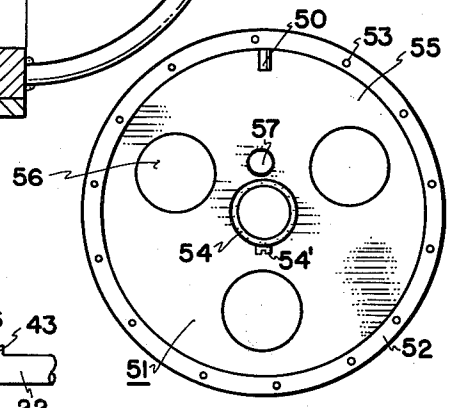


FIG. 4

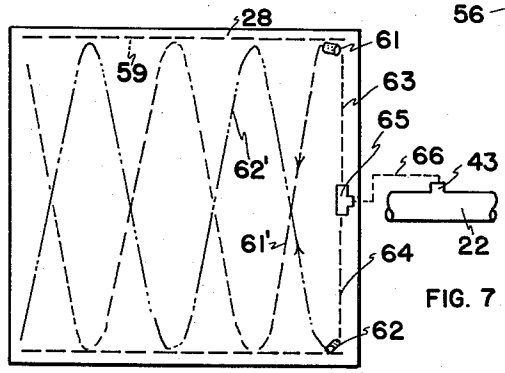


FIG. 7

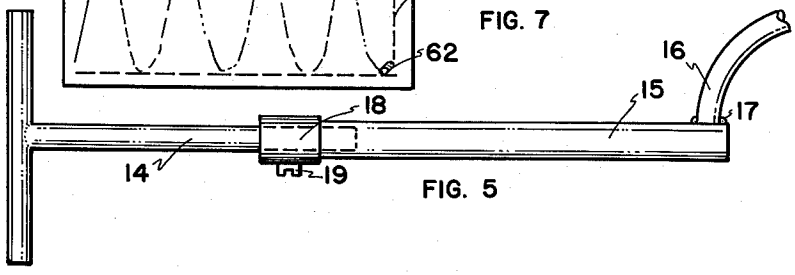


FIG. 5

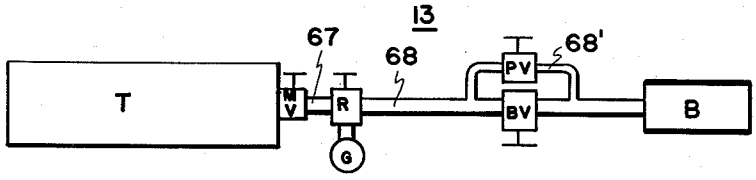


FIG. 6

INVENTOR.

EDWARD C. CAUFIELD

BY M. Ralph Shaffer

HIS ATTORNEY

United States Patent Office 2,990,755 Patented July 4, 1961

2,990,755

HEATED ASPHALT ROLLER DEVICE

Edward C. Caufield, 125 T St., Salt Lake City, Utah

Filed Jan. 26, 1959, Ser. No. 789,165
1 Claim. (Cl. 94—50)

This invention relates to heated asphalt roller devices which are hand operated and, more particularly, to a new and improved heated asphalt roller which, by virtue of its uniformly heated roller exterior, exhibits uniform and constantly satisfactory performance, much more so than that possible by the use of machines hitherto devised.

In the past, many attempts have been made to provide a satisfactory, heated hand roller for rolling asphalt surfaces. Most of the rollers now in use of which the inventor is aware employ as fuel some type of kerosene-and-air mixture, with the same being fed to one or more burners directed to small and limited portions of the roller interior. This results in "hot spots" in the roller exterior and cold surfaces, also. This non-uniformity in roller temperature often results in a quite unsatisfactory surfacing of asphalt areas.

Therefore, an object of the present invention is to provide an improved heated asphalt roller in which the heating of the roller interior is made more or less substantially uniform throughout, so as to avoid appreciable temperature gradients in the roller exterior.

A further object of the present invention is to provide a new and improved, heated asphalt roller of the type described which is adapted for the use of propane, butane, or natural gas as fuel for the same, so as to enable the production of flames of sufficient length to accomplish the intended function.

According to the present invention, a heated asphalt roller includes a handle, a uniquely configured axle and a roller, with heating apparatus suitably disposed within the roller so as to produce a flame which travels directly along the interior roller surfaces (and thus the jets are angulated relative to planes lying normal to the roller axle) rather than assuming dispositions lateral thereto. The burner apparatus and its disposition may be such as to provide either one or more helices of flame shooting out into spirals along the roller interior or exhibit a plurality of flames which are circularly disposed within the roller area and close to the roller's inner surface. In any case, the flames will travel substantially along their entire length along the roller interior, thereby rendering the roller completely and thoroughly heated throughout.

In order to establish the appropriate flame lengths of twenty-four to perhaps thirty or thirty-six inches a gaseous fuel such as propane, butane or natural gas is used, this being in preference to the conventionally employed kerosene-and-air mixture since the latter, at realistic pressures for purposes here intended, results in flame blow-out, much waste of kerosene and undesired spewing out of the kerosene onto adjacent asphalt areas.

Suitable valves and conduits in the present apparatus supply an automatic pilot light for the equipment; further, burner pressure may be regulated as desired.

Preferably, bearings mount the roller to the axle so that the axle may be fixed in its securement to the fuel conduction system and also to the handle of the apparatus.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claim. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which:

FIGURE 1 is a side elevation of a heated asphalt roller according to the present invention.

FIGURE 2 is a view, principally in cross-section, taken along the line 2—2 in FIGURE 1.

FIGURE 3 is an elevation of the end plate of the roller.

FIGURE 4 is an elevation of one type of burner, and mounting structure therefor, which may be employed by the roller.

FIGURE 5 is an elevation of the handle of the roller when rotated 90°.

FIGURE 6 is a schematic diagram of the fuel supply system of the roller.

FIGURE 7 is an elevation in schematic form of an alternative burner system which may be employed by the roller.

In FIGURE 1 heated asphalt roller 10 includes handle member 11, roller 12 mounted thereto, burner apparatus (illustrated in FIGURES 2 and 7), and a fuel supply system 13.

As may be seen with reference to FIGURES 1, 2 and 5, the handle member 11 includes a T-bar handle 14, a handle sleeve 15 slideably receiving and containing T-bar handle 14, a lower handle portion 16 welded or otherwise affixed as at 17 to the handle sleeve 15, a collar 18 provided with T-bar handle retaining set screw 19, and a mounting sleeve 20 provided with axle retaining set screw 21. Thus, the T-bar handle 14 is slideably adjustable within handle sleeve 15 and is retained in a selected position by means of the tightening of set screw 19 in collar 18. The entire handle member 11 is securely affixed to the roller axle 22 by means of the set screw 21, the latter being threaded into aperture 23 to come in contact with axle 22 within collar mounting aperture 24.

A depending support rod 25 is pivoted between a pair of mounting ears 26 of handle sleeve 15 by means of pivot pin 27. Accordingly, when the roller is temporarily not in use, then it will assume the configuration shown in FIGURE 1.

The roller 12 itself includes a cylindrically configured roller shell 28 having end plate 29 and ring 30 sweated within, welded or otherwise affixed to the roller shell ends as shown in FIGURE 2. The end plate 29, shown with particularity in FIGURE 2, includes a plurality of vent apertures 31 and a central mounting bore 32 having recessed, counter-sunk area 33. The recessed area 33 is provided for the inclusion of bearing 34 (shown in FIGURE 2) within the structure, the inner and outer races of bearing 34 being secured as by threads, set screws, or other means to the end plate 29 and also to end portion 35 of axle 22.

As is seen in FIGURE 2, the end portion of 35 of axle 22 is of less diameter than the principal section of the axle and is formed or delineated by axle shoulder 36.

Fixedly attached to end ring 30 in FIGURE 2 are radius bars 37, the same being of a curved nature as illustrated in FIGURES 1 and 2 and being affixed at their ends to ring 30 and also to collar 38 by welds, for example. Collar 38 may be provided with an internal recess 39 to accommodate the position of bearing 40. Bearings 34 and 40 may be either of the ball type as shown in FIGURE 2 or of the cylindrical roller type, or other suitable type as desired. Shoulder 41 of axle 22 delineates the end portion 42 of the axle 22.

The axle 22, itself, is now to be examined. It is seen in FIGURE 2 that it is provided with a pair of ports 43 and 44, the same having radial apertures 45 and 46, respectively, which communicate with central aperture 47. These several axle apertures are delineated by the dotted lines in FIGURE 2. A plug 48 is inserted within the outermost end of aperture 47 to close the same. It will of course be understood that the port 44, serving as the fuel inlet port, may itself be constituted by the unplugged end of aperture 47. Port 43 serves as the fuel outlet port to which conduit 49 is affixed.

The remaining end of fuel conduit **49** is attached to port **50** of ring-configured burner **51**. This ring-configured burner is shown in elevation in FIGURE 4 and includes a hollow ring portion **52** having a plurality of fuel jets or apertures **53** and also an appropriate mounting structure such as that illustrated by the mounting collor **54** and flange **55** integral therewith. The collar **54** is provided with a set screw **54'** for securing the burner structure to the axle **22** proper. The flange **55** may include lighting and access apertures **56** and also, if a separate aperture is desired, the access aperture **57** to accommodate the positioning therewithin of fuel conduit **49**.

It will be noted that the fuel jet apertures **53** enjoy a circular pattern; this is to say, the locus of the centers of the several jets or apertures **53** define a circle which provided, in effect, a cylinder of flame concentric with cylindrically configured roller shell **28** and axle **22**. The cylindrical flame thus produced is in close proximity with the inner wall or surface **58** of roller shell **28**.

Two of the flame fingers **59** and **60** are shown in FIGURE 2. Herein lies the central feature of the invention. It will be seen with reference to FIGURE 2 that the flames generated by the burner apparatus lie, substantially along their entire length, immediately adjacent the inner wall **58** of shell **28**, thereby rendering the entire outer surface of the cylindrical shell hot and easily maintainable, as shall be hereinafter described, at a desired and uniform temperature. There will be no "hot spots" and cool areas on the outer surface of the roller.

Before describing in detail the fuel supply system of the burner device, it is well to consider a second form which the burner apparatus may take. This is illustrated, somewhat schematically, in FIGURE 7 wherein it will be seen that a pair of diametrically opposed burners **61** and **62** are disposed closely adjacent the inner surface **59** of the cylindrically configured roller shell **28** at one end thereof, the burners **61** and **62** being angulated as indicated in opposing directions, and being therefore not in the same plane with the roller axle, so that the two burners produce interlaced flames. Thus, the generation of but two flames may be employed to produce a pair of intermeshed spirals or helices of flame **61'** and **62'** so as to heat substantially the entire inner wall **59** of cylindrical shell **28**.

When the burner apparatus illustrated schematically in FIGURE 7 is used, then the burners **61** and **62** will be connected to the fuel supply by means of conduits **63** and **64** with T-connector **65** coupled thereto and conduit **66** leading to fuel outlet port **43** of axle **22**.

As in FIGURE 2, the alternate alternative form of the burner apparatus as shown in FIGURE 7 generates flames which are disposed substantially along the entire length thereof, along the inner wall **59** of shell **28**, thereby heating the entire inner surface of the roller so as to avoid "hot spots" and cold areas along the outer surface of the roller.

Turning to FIGURE 6, finally, it is seen that the fuel system includes a fuel tank T having a manually actuable valve MV attached thereto and integral therewith. Conduit **67** connects the main valve MV to regulator R, the same being provided with gauge G to indicate the pressure on preferably the high-pressure side of the regulator R. Conduit **68** connects the regulator to a manually actuatable burner valve BV which leads to burner apparatus B. As seen in FIGURE 6, the conduit **68** includes a by-pass **68'** including a manually actuatable pilot valve PV. The purpose for this by-pass conduit **68'** and pilot valve PV is to provide a self-contained pilot light for the burner apparatus. Thus, when the main valve and regulator are turned on, the burner valve BV may be closed and the pilot valve PV opened slightly so as to supply a suitable pilot flame for the burner apparatus. Hence, the burner valve may be opened as needed so as to supply the requisite flames within the roller shell of the device.

In practice, the tank should contain a gaseous fuel such as propane, butane, or natural gas at a pressure of thirty to one hundred and ninty pounds per square inch. A suitable operative pressure for the burners will be between fifteen and twenty-three pounds per square inch. Such pressure will be sufficient to generate flames twenty-four to thirty inches or so in length (see FIGURE 2).

Accordingly, it is seen that the present invention provides a new and improved asphalt roller apparatus wherein the roller is uniformly heated throughout by virtue of the flames generated therewithin being disposed lengthwise against a substantial area (eighty percent plus) of the inner wall of the roller shell.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects, and, therefore, the aim in the appended claim is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

A heated asphalt roller including, in combination, a cylindrically configured roller shell, an axle, means journalling said shell upon said axle, handle means affixed to said axle, means containing a charge of gaseous fuel in compressed condition mounted upon said handle means, means for conducting said fuel from said containing means through a portion of said axle to and within said roller shell, and burner means connected to said conducting means and fixedly disposed with respect to said axle, within and closely adjacent said cylindrically configured roller shell, for producing a plurality of flames the paths of which define substantially a cylinder of flame concentric with, interior of, and in close proximity to said roller shell, and wherein said burner means comprises a burner ring mounted to said axle at one end of said roller in concentric and proximate relation with the interior of said roller shell, said ring facing the remaining roller end and including a plurality of fuel outlet apertures the locus of the centers of which describe a circle.

References Cited in the file of this patent

UNITED STATES PATENTS

197,713	Abbott	Dec. 4, 1877
524,939	Dennison	Aug. 21, 1894
1,237,634	Gratton	Aug. 21, 1917
1,246,696	Ammann	Nov. 13, 1917
1,509,236	Greene	Sept. 23, 1924