July 24, 1962 R. L. HOUCK 3,045,566

MACHINE FOR GROOVING ROAD PAVING TO RECEIVE EXPANSION STRIPS

Filed Nov. 24, 1959

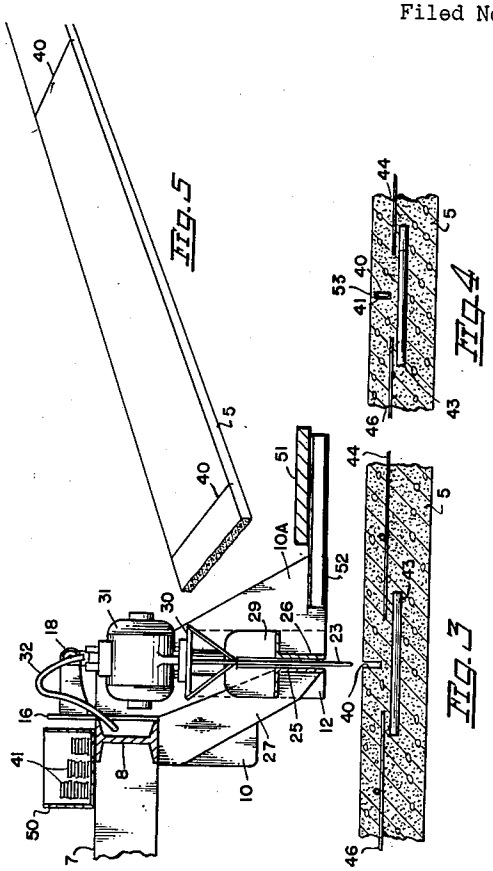


FIG. 5

FIG. 4

FIG. 3

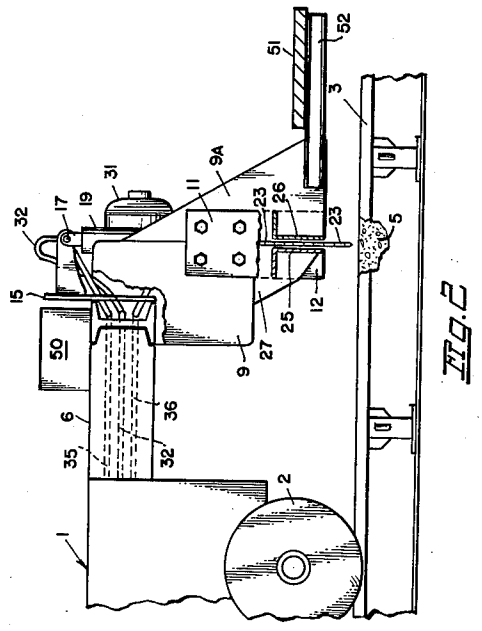


FIG. 2

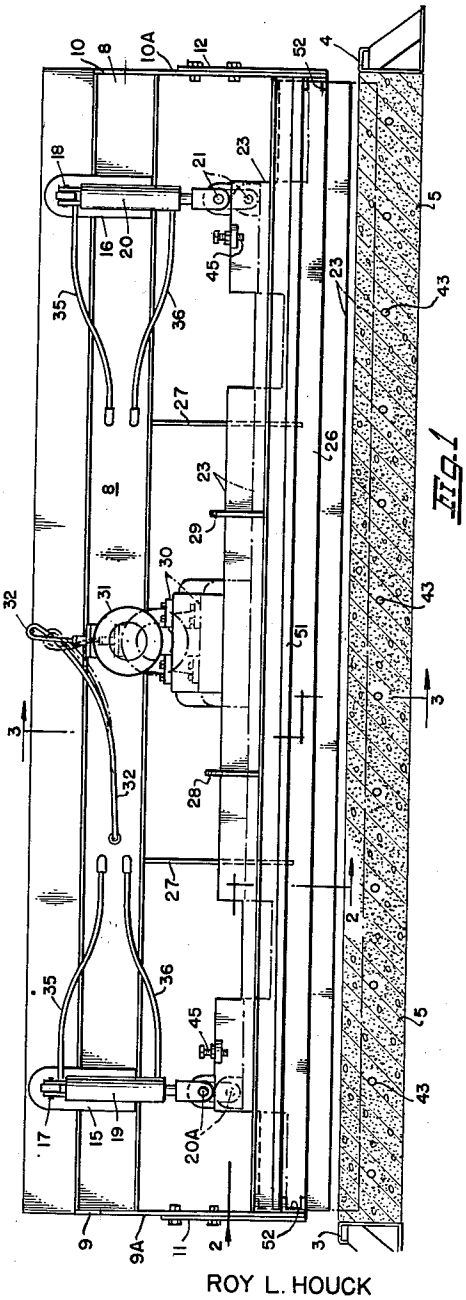


FIG. 1

ROY L. HOUCK

INVENTOR.

BY James A. Givnan

ATTY

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MACHINE FOR GROOVING ROAD PAVING TO RECEIVE EXPANSION STRIPS

Roy L. Houck, 1585 NE. 20th St., Salem, Oreg.

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1 Claim. (Cl. 94—39)

This invention relates to the construction of paved roadways and similar surfaces.

More particularly the invention relates to a machine adapted for attachment to or mounting upon one end of a conventional road paving machine movable alongside forms of a roadway under construction and being paved with cementitious material temporarily in a plastic condition.

The principal objects of the invention are:

To provide means for forming a groove of predetermined depth transversely of the paving material at predetermined intervals throughout the length of the roadway for embedding expansion strips therein.

To provide a pressure-responsive vertically reciprocal incisory blade and vibratory means associated therewith for subjecting the blade to high frequency vibration in the direction of gravitational forces to produce a well defined smooth-walled groove across the roadway. The vibratory and compacting motion set up in the mass itself increases the density of that mass.

To produce a groove with the qualifications above pointed out which, without weakening the paving when solidified, will predominate the natural cracking of the paving caused by temperature variations, frost heaving or other natural causes.

To provide a method of penetrating paving material with a blade by combined pressure and vibratory motion instead of by pressure alone.

The foregoing and other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a rear elevational view of a machine made in accordance with my invention in an operational position relative to cementitious road-paving material in a plastic state and confined between side forms of a roadway under construction.

FIGURE 2 is a side elevational view of FIGURE 1 showing the machine attached to and extending rearwardly from a concrete finisher, and with fragments broken away and partly in section along the line 2—2 of FIGURE 1.

FIGURE 3 is a sectional elevational view taken along the line 3—3 of FIGURE 1.

FIGURE 4 is a fragmentary sectional detail view showing the groove produced by the incisory blade of the machine and how the groove appears when finally smoothed over to conceal itself and an enclosed expansion strip within the paving material.

FIGURE 5 is a fragmentary perspective view on a reduced scale of a paved roadway provided with grooves produced by the incisory blade of the invention.

With continuing reference to the drawing, wherein like reference characters designate like parts, reference numeral 1 indicates generally the rearward end of a concrete finishing machine supported upon flanged wheels 2 engaged with and movable along rail-like side forms 3 and 4 of a roadway being paved with cementitious material 5. Secured to and extending rearwardly from the machine 1 are two parallel channel members 6 and 7 interconnected at their outer ends by a transverse I-beam 8. Secured to and depending from the ends of the I-beam are two pairs of side plates 9, 9A and 10, 10A. The plates

in each pair are in vertical alignment with each other as best shown in FIGURE 1, and interconnected by reinforcing plates 11 and 12 respectively.

Secured to the I-beam 8 near the ends thereof are two vertical plates 15 and 16 and pivotally supported by the plates at 17 and 18 are two fluid motor cylinders 19 and 20. The pistons (not shown) within the motor cylinders are pivotally connected as at 20A and 21 to the top edge of a vertically reciprocal incisory blade 23 near the ends thereof as shown. This blade is guided (FIGURES 2 and 3) in its reciprocal movement between the vertical flanges of angle irons 25 and 26 secured at their ends respectively to the bottom end of the reinforcing plates 11, 12, the adjacent corners of the side plates 9A, 10A, and supported intermediate their ends by brackets 27 depending from the I-beam 8. Further guidance above the guides 25, 26 is provided by vertically slotted plates 28 and 29 secured to the guides and straddling the blade.

Superimposed upon and secured to the blade 23 at the center thereof by means of a supporting platform 30 is an electric motor-driven mechanical vibrator 31 provided with electrical current through a conduit 32 from a source (not shown) carried by the machine 1.

Fluid pressure from a source (not shown) also carried by the machine 1 is supplied through suitable control valves (not shown) and conduits 35 and 36 respectively to the top and bottom interior of the motor cylinders 19 and 20.

Operation

At predetermined intervals along the roadway an upwardly opening transverse groove 40 is formed for the reception of a strip of bituminous material, or the like, 41 to provide a contraction joint above and centrally of dowels 43 embedded in the concrete in spaced apart parallel relation to each other and to the center line of the roadway. Spaced apart adjacent ends of steel reinforcing webs 44 and 46 terminate between the end portions of the dowels.

With the machine at a standstill, and the incisory blade 23 centered over the dowels, fluid pressure is applied to the top interior of the motor cylinders 19, 20 while at the same time electric current is supplied to the motor-driven vibrator 31. The blade 23, now vibrating in gyratory motion, is forced downwardly into the plastic paving material to a depth determined by the setting of blade-mounted limit stop screws 45 in relation to the guide members 25, 26.

The strip material is carried in an elongated box 50 secured in any suitable manner to the channel members 5 and 7 or to the I-beam if desired and within convenient reach of an operator standing upon a platform 51 supported upon rearwardly extending channel members 52 secured to the side plates 9A and 10A.

The completed contraction joint is finally concealed by smoothing the green concrete over the top of the groove as at 53 in FIGURE 4.

While I have shown a particular form of embodiment of my invention I am aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

A device for use in surface paving operations wherein the paving comprises cementitious material temporarily in a plastic state and confined between side rails, said device comprising a framework including a horizontally disposed supporting beam, means rigidly mounting said supporting beam to a vehicle supported upon said rails and movable therealong, side plates secured to and extending downwardly and rearwardly from said supporting beam, angle

irons coextensive in length with said supporting beam secured at their ends to said side plates in spaced relationship to each other, an incisory blade vertically slidable between said angle irons, a fluid pressure motor secured to said supporting beam at each end thereof and operatively connected to said incisory blade near each end thereof, a motor driven mechanical vibrator mounted upon said incisory blade at the center thereof, independent vertically adjustable and lockable limit stops carried by said incisory blade near the ends thereof for contacting one of said angle irons on the down stroke of said incisory blade to limit the downward thrust thereof into the paving material to thereby limit the depth of a transverse groove cut in said material by said blade and whereby simultaneous or selective operation of said motor cylinders will respectively thrust said incisory blade into said material parallel therewith or in angular relation thereto.

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