Sept. 26, 1967 R. N. ATKINSON 3,343,470

CONCRETE JOINT FORM INSERTER

Filed May 28, 1965 2 Sheets-Sheet 1

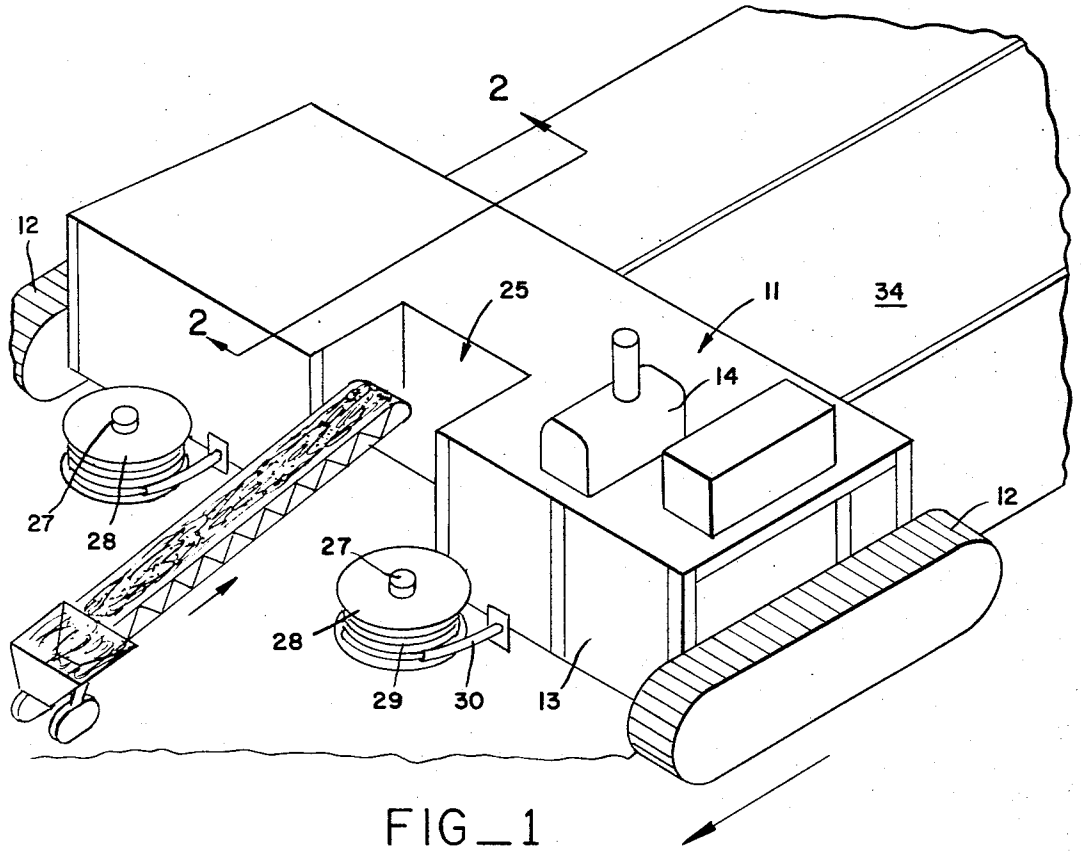



FIG_1

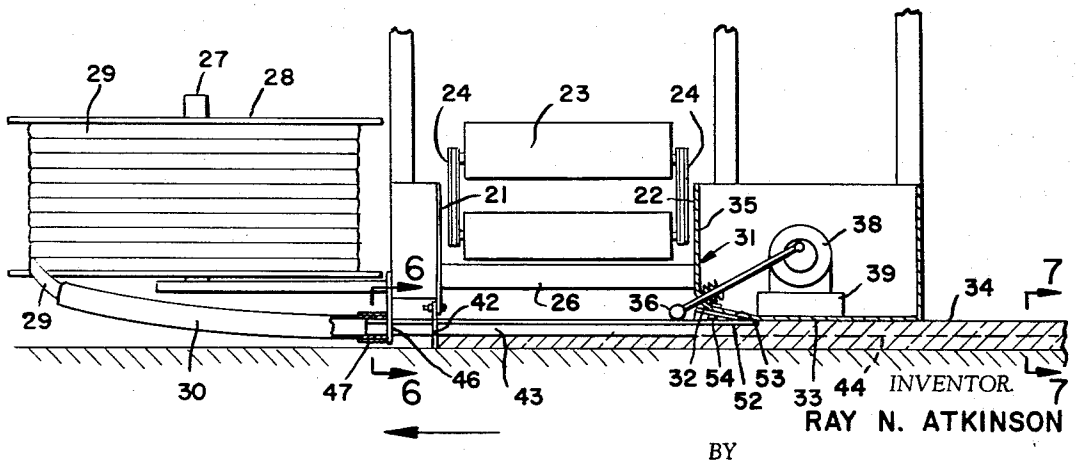



FIG_2

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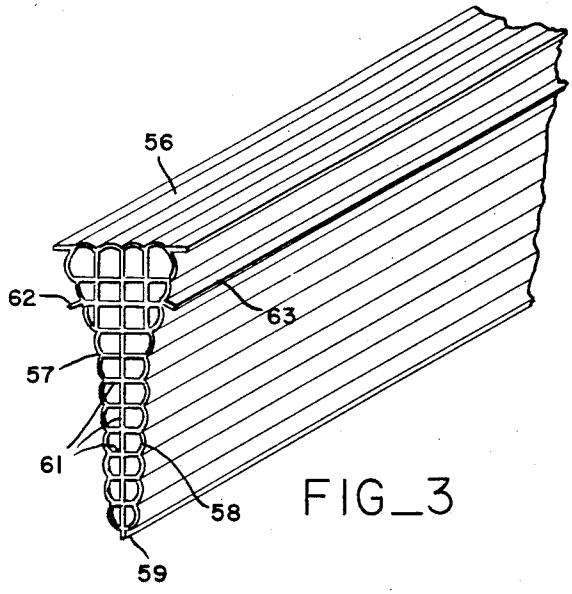



FIG_3

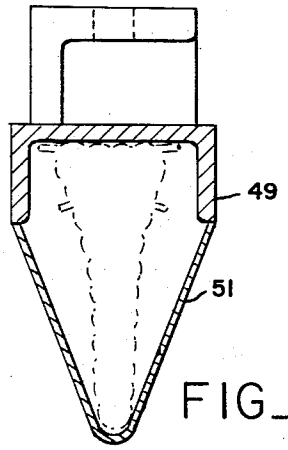



FIG_5

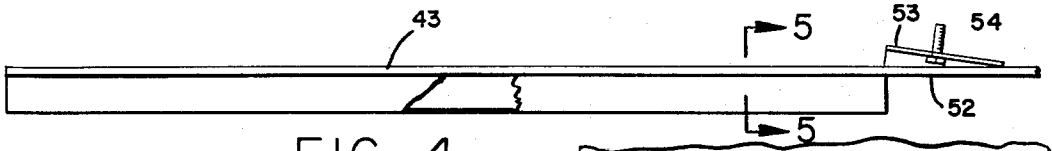



FIG_4

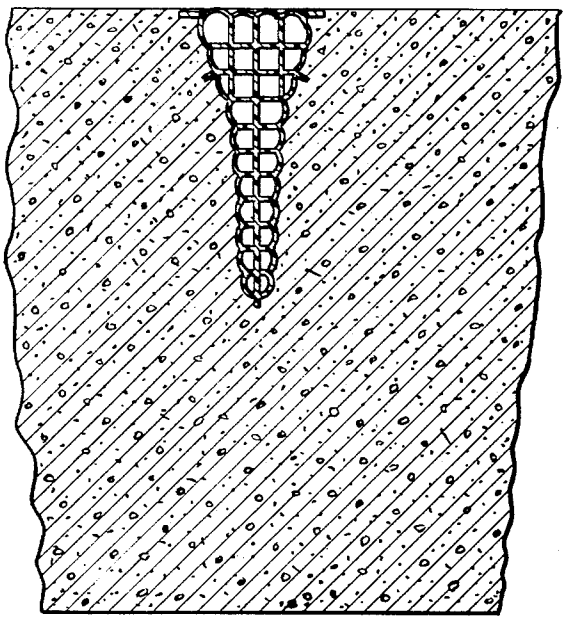


FIG_7

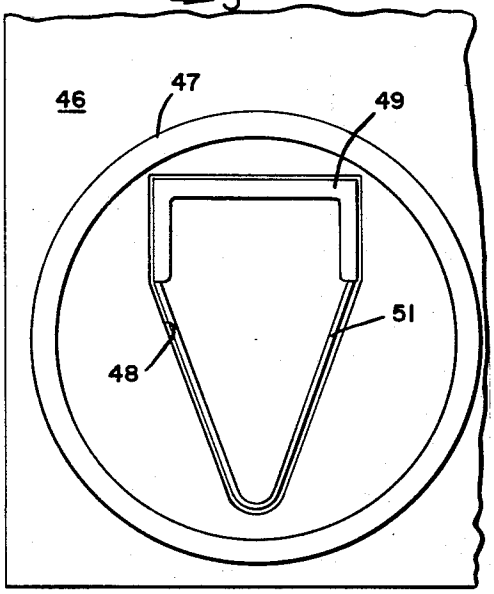



FIG_6

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3,343,470

# CONCRETE JOINT FORM INSERTER

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2 Claims. (Cl. 94—51)

## ABSTRACT OF THE DISCLOSURE

This invention relates to an apparatus for continuously inserting joint forms in concrete simultaneously with laying of the concrete. The device unwinds flexible joint forms as it moves along the surface. The joint form is carried by a first guiding conduit and a second conduit whose configuration is similar to that of the form wherefrom it is discharged into the soft concrete. A guide assures that the form will not ride above the surface of the concrete and the vibrator is provided to consolidate the concrete around the form.

The present invention relates generally to concrete construction and more particularly to concrete joint form inserters for inserting concrete joint forms in concrete pavement during a paving operation.

In the paving of canal linings, roadways, airport runways and other paved surfaces, it is common to provide weakened planes whereby any fracture or cleavage will take place along controlled regions. Such weakened planes have, in the past, been provided in various ways. For example, weakened planes have been defined by grooves formed in the pavement, by embedding flexible or inflexible material in the pavement and by cutting after the concrete has set up.

When flexible material is embedded in the concrete, it is desirable to have intimate contact of the material with the concrete. This is desirable so that the joint form is firmly embedded in the concrete. For this purpose, it is desirable to insert the joint form strip before the material is screeded or extruded so that the material will consolidate about the strip in intimate contact therewith.

It is a general object of the present invention to provide an improved joint form inserter.

It is another object of the present invention to provide a joint form inserter which delivers the joint form in the concrete delivery zone of the paver at a predetermined level where the concrete consolidates about the same during pouring and extrusion.

It is another object of the present invention to provide a concrete form inserter which includes a protective guide to deliver the strip into the delivery zone at a point preceding the extrusion plate and which maintains the strip at an appropriate level until extrusion is completed.

The foregoing and other objects of the invention will become more clearly apparent from the following description taken in conjunction with the accompanying drawing.

Referring to the drawing:

FIGURE 1 is a perspective view showing a concrete paving machine incorporating the concrete joint form inserter of the present invention;

FIGURE 2 is a sectional view taken generally along the line 2—2 of FIGURE 1;

FIGURE 3 is a view of one type of concrete joint form;

FIGURE 4 is an elevational view of the concrete joint form inserter tube;

FIGURE 5 is an enlarged sectional view taken along the line 5—5 of FIGURE 4;

FIGURE 6 is an enlarged view taken generally along the line 6—6 of FIGURE 2; and



FIGURE 7 is an enlarged partial sectional view taken along the line 7—7 of FIGURE 2.

Referring to FIGURES 1 and 2, there is schematically shown a concrete paving machine 11 carried by self-propelled tracks 12.

The paving portion of the machine comprises an open framework 13 which supports the power plant 14 for applying driving energy to the various operating components of the machine.

The correct elevation and thickness of the pavement may be maintained by grading the ground in front of the tracks to the proper elevation. In addition, or alternatively, the machine frame may be supported on the tracks by hydraulic jacks. These jacks may be operated through a servo-control circuit including grade lines and feelers to maintain and control the elevation of the framework.

Referring to FIGURE 2, the front portion of the machine includes a concrete delivery zone formed by an open trough defined by a front wall 21 and a rear wall 22. A bucket line 23 is carried by a chain 24 and serves to convey material from receiving hopper 25 (FIGURE 1) across the open trough and deposit the same in front of the rear wall 22. Baffles 26 may be provided along the open trough to form so-called pockets which deliver the concrete to the extrusion zone. These baffles are particularly important when the pavement is formed on sloping sides as, for example, canal banks, as they serve to retain the concrete and prevent downhill slippage.

The front of the machine may have outwardly extending supports which include spindles 27 upon which reels 28 of flexible material 29 are carried. The flexible material is fed from the reel into open tubes 30 as will be presently described in detail.

The rear wall 22 of the trough, FIGURE 2, is formed by the upwardly extending portion of the extrusion plate 31. The extrusion plate is curved at 32 and has a portion 35 which extends vertically upwardly and a portion 33 which extends rearwardly, generally horizontally to level, and extrudes the concrete so that the upper surface 34 of the concrete is finished at the appropriate level. A vibrator 36 may extend along the front of the curved portion 32 and be vibrated by a vibrator 38 carried on platform 39.

The lower portion of the front wall 21 includes a rubber retainer band 42 which keeps the wet concrete from running forward.

The concrete joint form 29 is shown being delivered from a reel 28 to the open end of a tube 30 which communicates with the front end of an inserter tube 43. The joint form strip leaves the inserter tube 43 and is shown in dotted outline at 44 embedded in the concrete.

Referring more particularly to tube 30, it is supported by a bracket 46 which is bolted to the frame and which has welded thereto a sleeve 47 which threadably receives the tube 30. The bracket 46 has an opening 48 (FIGURE 6) formed therein to receive and support the front end of the inserter tube 43.

Referring to FIGURES 4 and 5, the inserter tube is formed by an inverted channel 49 which has secured thereto a shield member 54 which may, for example, be made of sheet material and which is secured to the ends of the channel to provide an opening having a substantially rectangular cross-section. The lower shield is terminated before the rear end of the channel whereby the plastic form is exposed to the wet concrete so that it may consolidate about the same and yet is held in position by the extending channel portion 52 (FIGURES 2 and 4). The extending channel portion 52 includes a bracket 53 through which a bolt 54 extends for supporting the rear end of the inserter tube 43 from the extrusion plate in such a manner that a plane coextensive with the lower

surface of the base of the inverted channel is coplanar with the lower surface of the extrusion plate.

Thus, it is seen that the fresh concrete flows about the tube prior to extrusion and that the vibrating and extrusion steps further consolidate the concrete and securely hold the plastic joint form in place as it emerges from the shielded portion of the inserter tube.

A plastic joint form may be of the type shown in FIGURE 3 and consist of a hollow elongated extruded strip of material having a top wall **56** and spaced depending side walls **57** and **58** which join at the bottom to define a longitudinal edge **59**. The interior of the joint form may be cellular and the cells may, for example, be formed by horizontal and vertical joined partition walls **61** to provide longitudinal channels or passageways. The walls **57** and **58** may carry fins **62** and **63** which are embedded in the concrete when it is consolidated about the concrete joint form. The fins serve to retain the form in the concrete. The strip material may, for example, be a flexible polyethylene material.

Referring again to FIGURES 1 and 2, the concrete joint form may be reeled on reels which are carried in front of the machine. The material is inserted into the tube **30** through the inserter tube **43** and extends to the rear of the machine where it may be suitably secured to existing pavement as, for example, by a nail or the like. As the paving machine moves forward and the concrete is deposited in front of the extrusion plate, it serves to extrude the finished concrete surface. The joint form is unreeled and embedded in the concrete.

I claim:

**1.** A device for paving a surface and simultaneously inserting a flexible longitudinal joint form in the paving material including:

a framework movable over said surface,

said framework being provided with means defining a trough for receiving paving materials and discharging them onto said surface,

said trough including a front wall and a rear wall, said rear wall including an extrusion plate to extrude and strike off the paving material discharged from said trough,

means for delivering said joint form into said paving material as the material is discharged onto said surface,

said delivering means including an inserter tube of generally the same cross-section as said form so that the paving material can consolidate about said form as it is discharged from said inserter tube, said inserter tube having an inlet end and an outlet end, said inserter tube being mounted on said framework with said inlet end spaced forwardly of the front wall of said trough to be free from contact with said paving material, and said outlet end being near said extrusion plate,

said inserter tube having a relatively flat upper portion, the lower surface of said portion being coplanar with the lower surface of said extrusion plate, and

vibrating means connected to said inserter tube for applying vibration to the paving material.

**2.** A device as recited in claim **1** wherein the upper portion of said inserter tube extends rearwardly of said outlet end of said tube and extends partially under said extrusion plate so that the joint form being discharged by said inserter tube is subjected to continuous downward pressure from said extension and said extrusion plate.


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