

[54] **APPLICATOR FOR PAVEMENT MARKERS** 3,086,431 4/1963 Perry 404/94
[75] Inventor: **James K. Blomberg**, Richfield, 3,427,933 2/1969 Taylor-Meyers..... 404/83 X
Minn. 3,590,701 7/1971 Tenbroeck..... 404/94

[73] Assignee: **Minnesota Mining & Manufacturing Company**, St. Paul, Minn.

[22] Filed: **Feb. 4, 1974**

[21] Appl. No.: **439,090**

[52] **U.S. Cl.** **404/94**
[51] **Int. Cl.** **E01c 23/16**
[58] **Field of Search** 404/94, 83, 72; 401/118; 52/749

Primary Examiner—Nile C. Byers, Jr.
Attorney, Agent, or Firm—Alexander, Sell, Steldt & Delahunt

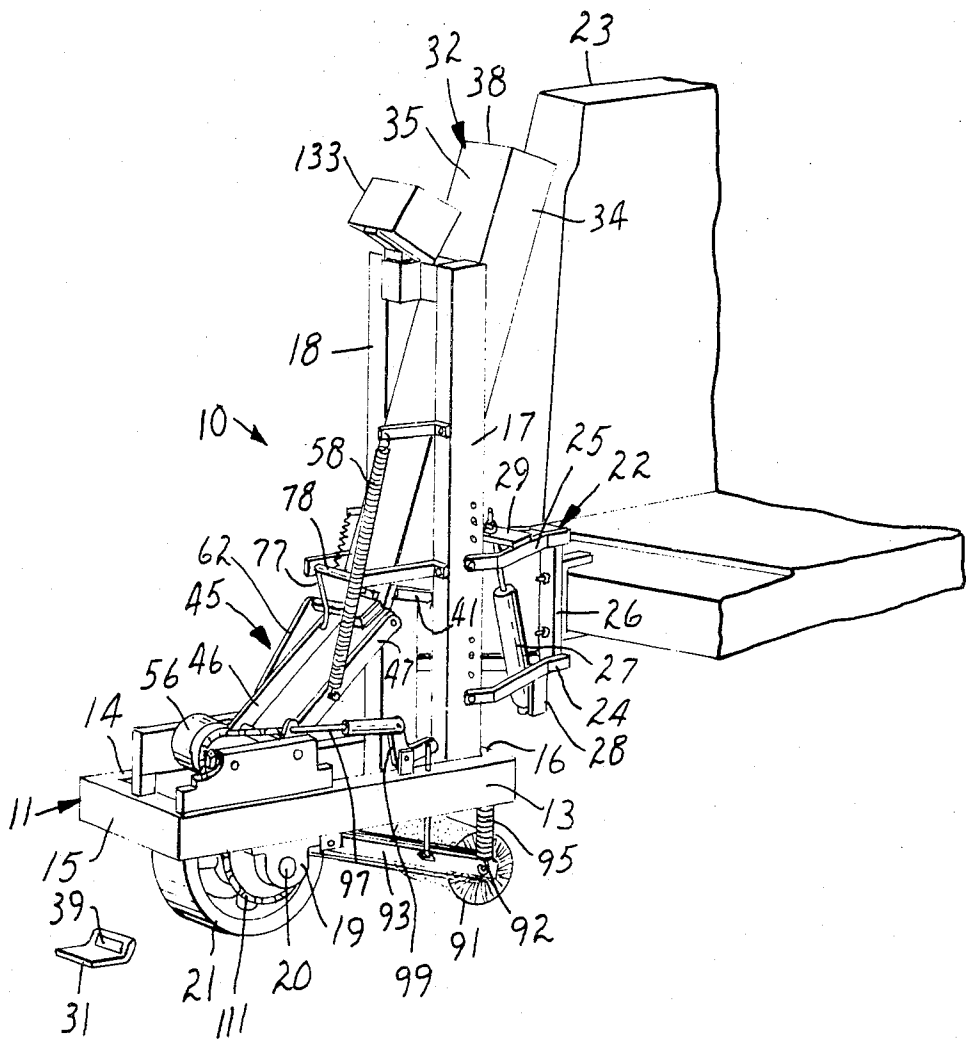
[57] **ABSTRACT**

An applicator for applying pavement markers. The pavement markers are arranged in a stack in a magazine on the applicator. A picker means picks an end pavement marker from the stack and carries the marker into wedging contact between a pavement-engaging wheel of the applicator and the pavement. Thereupon, the pavement marker is pulled from the picker means and adhered to the roadway.

15 Claims, 13 Drawing Figures

[56] **References Cited**
UNITED STATES PATENTS

1,974,979	9/1934	Bate.....	404/94 X
2,187,879	1/1940	Johnson.....	404/72



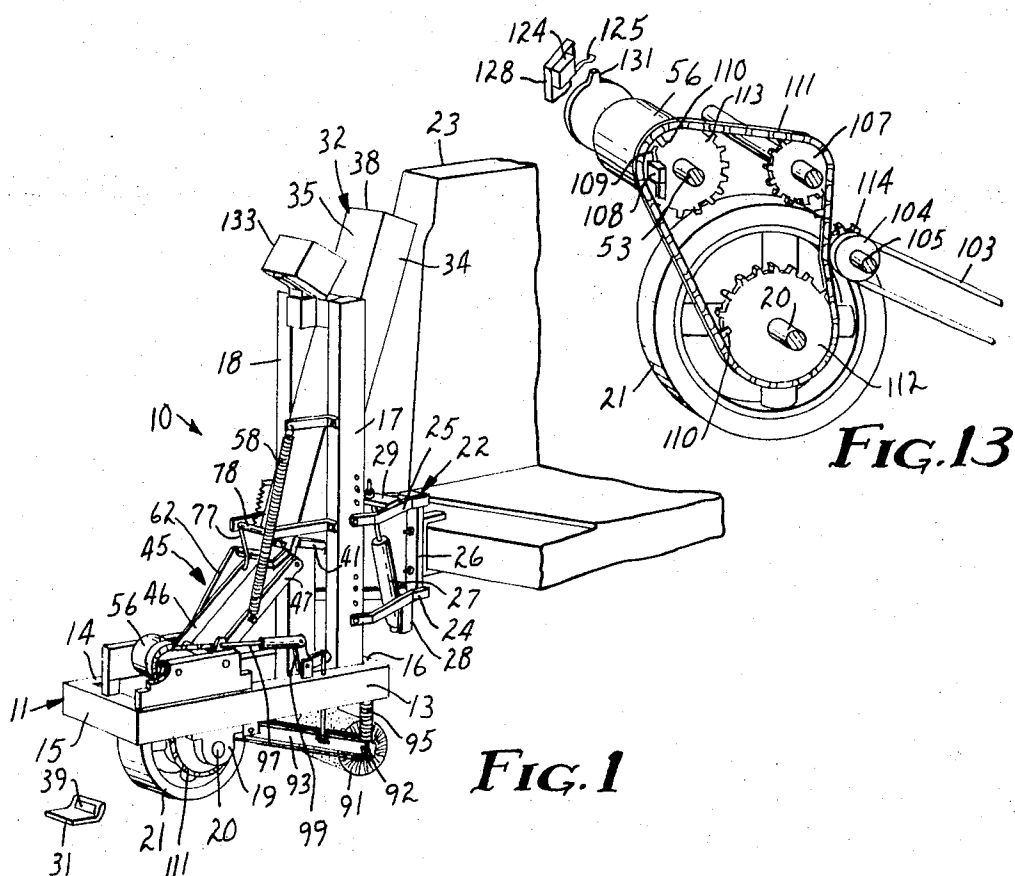
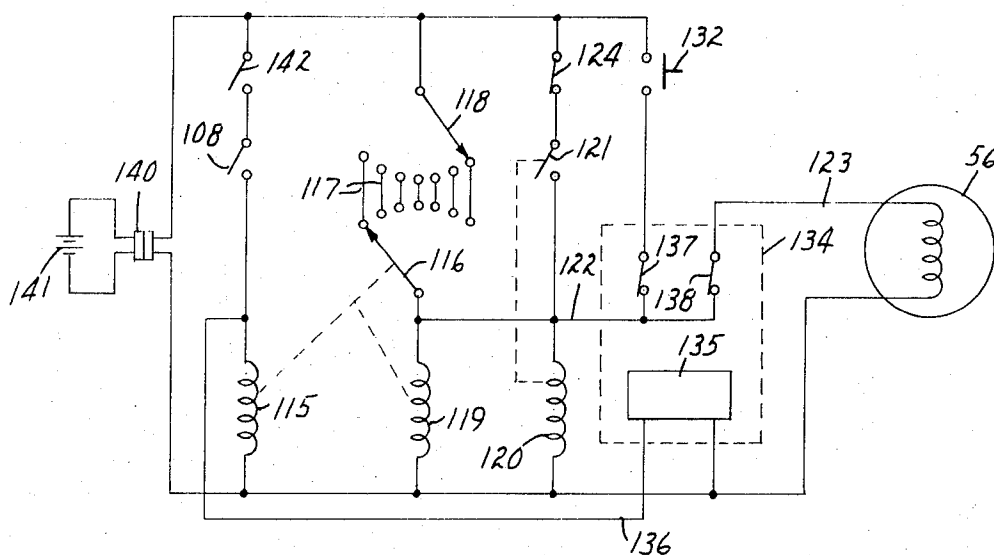
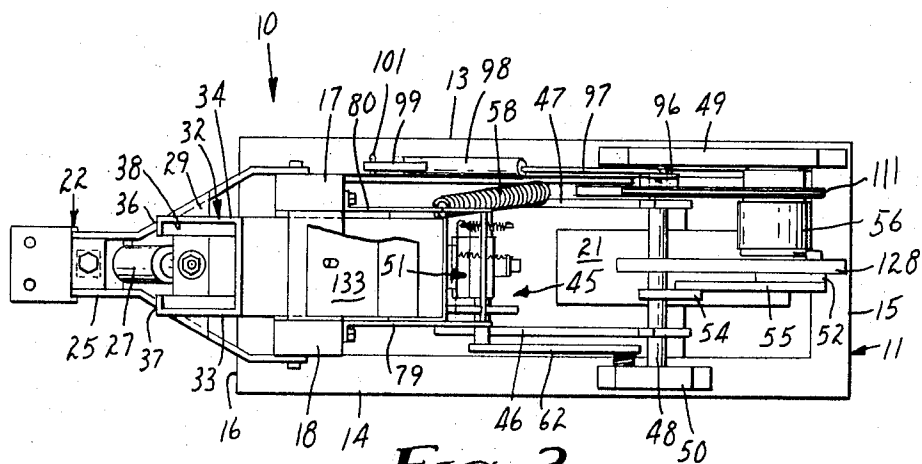
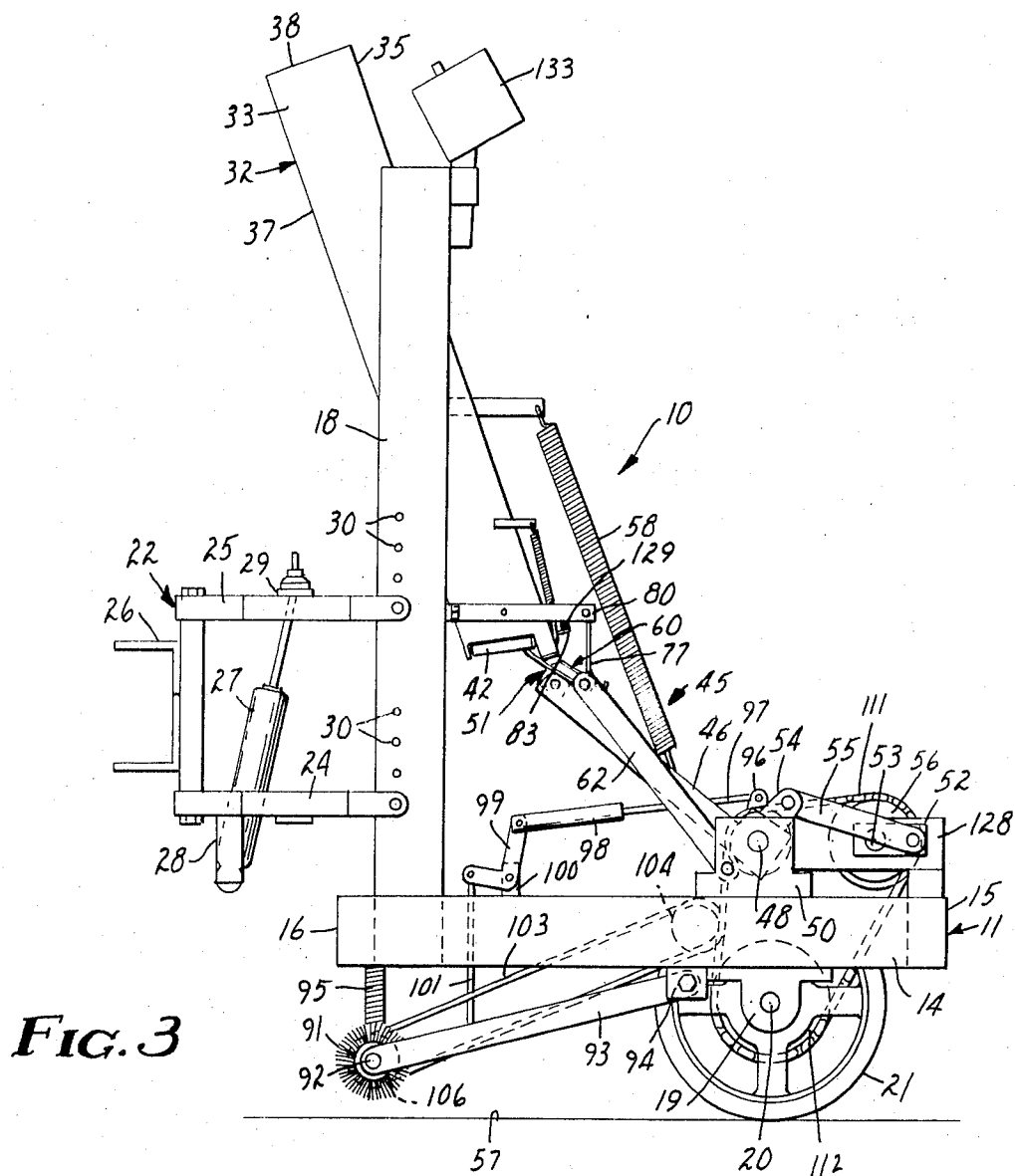


FIG. 12



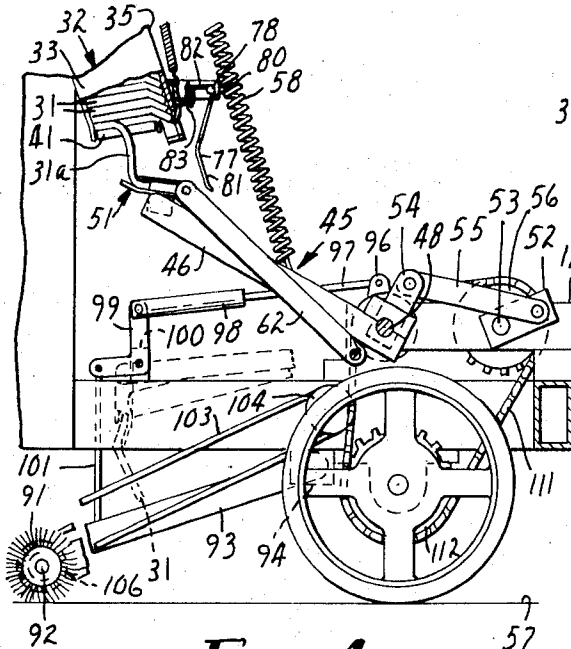


FIG. 4

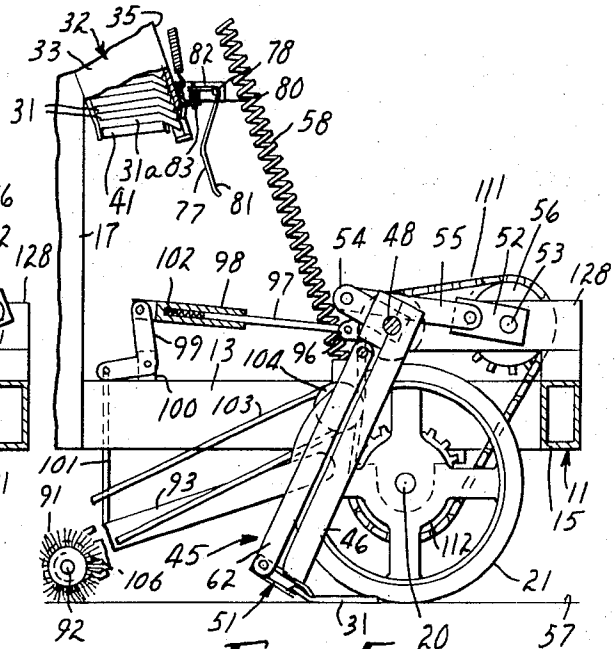


FIG. 5

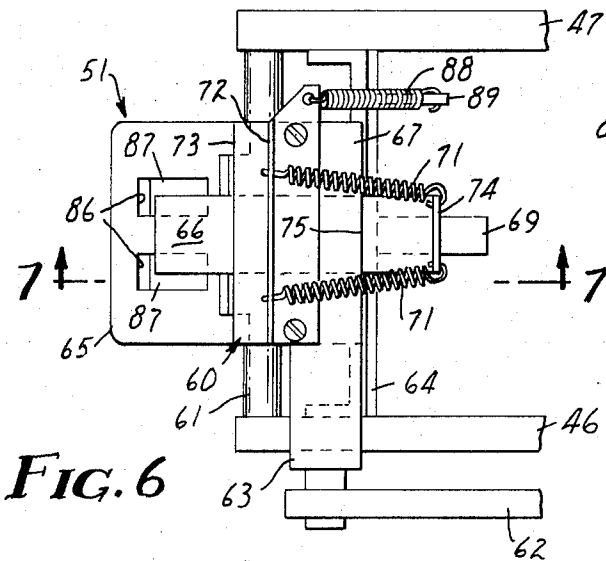


FIG. 6

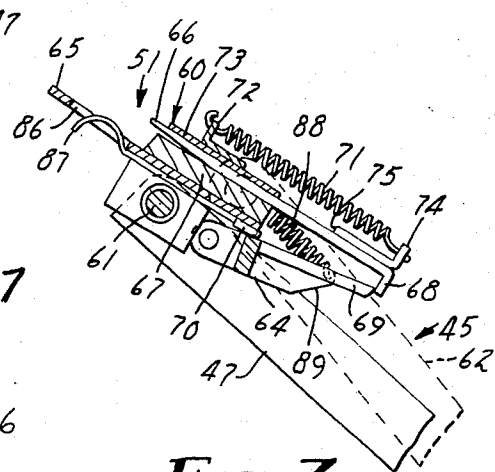


FIG. 7

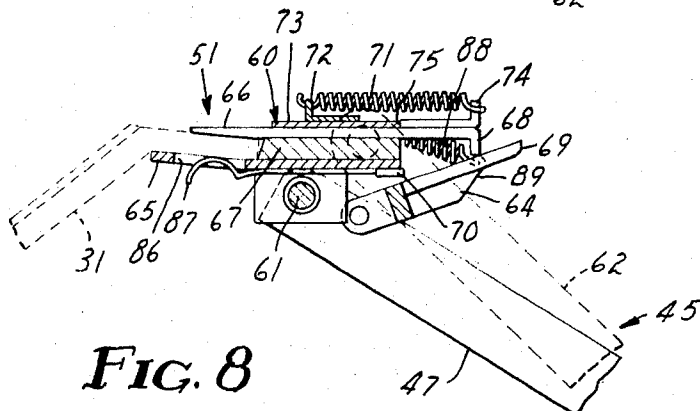


FIG. 8

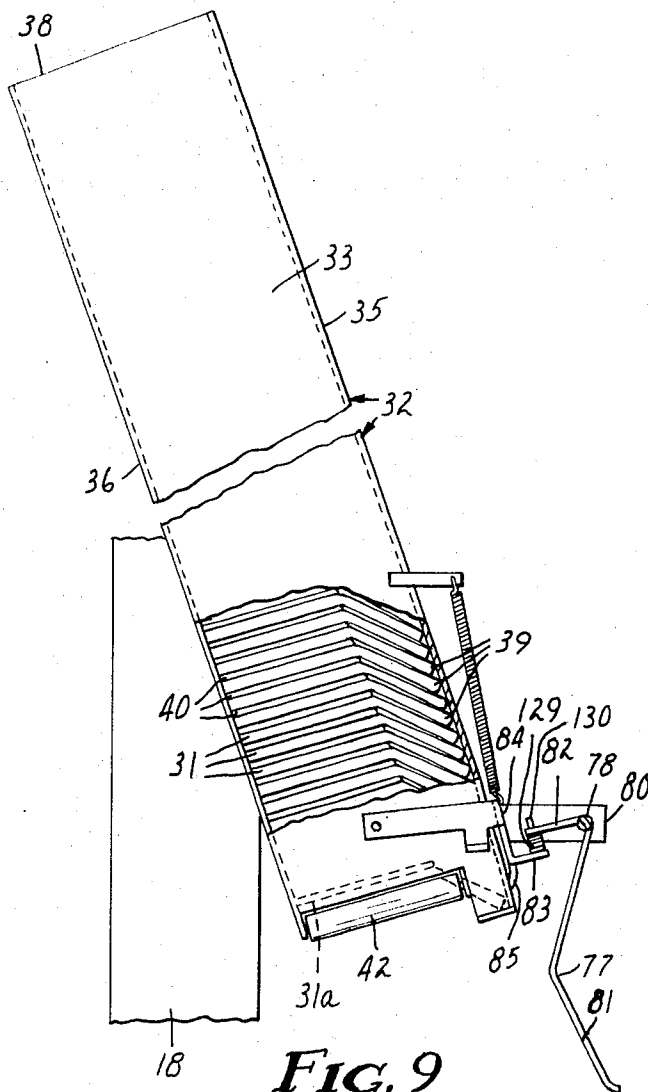


FIG. 9

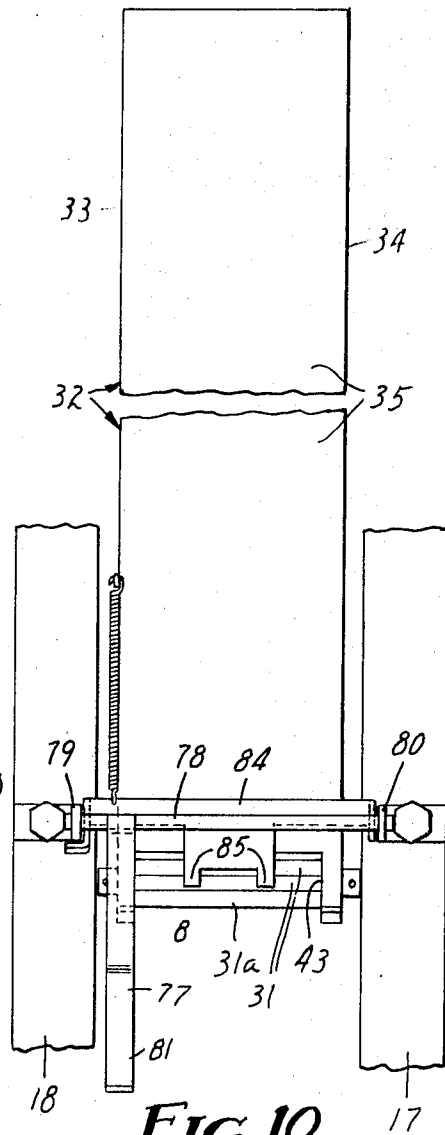


FIG. 10

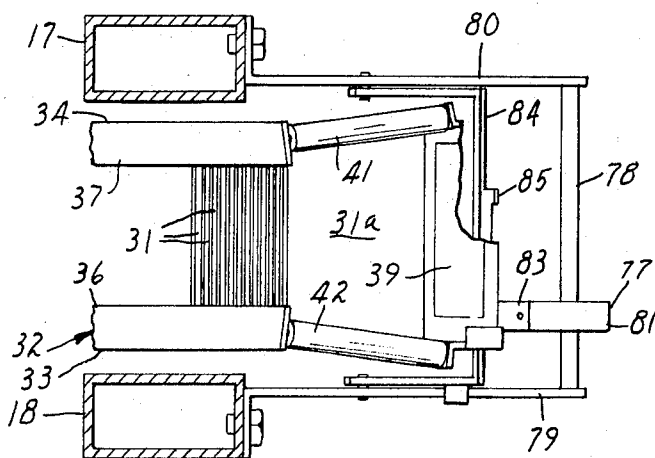


FIG. 11

APPLICATOR FOR PAVEMENT MARKERS

BACKGROUND OF THE INVENTION

Raised retroreflective markers applied along the surface of a roadway between lanes of travel offer a valuable way to visibly separate the lanes. An especially useful raised retroreflective pavement marker is a molded elastomeric marker that comprises a) a generally flat base portion having a bottom surface covered with a layer of pressure-sensitive adhesive by which the marker is adhered to the pavement, and b) a retroreflective inclined flap extending upwardly from the base portion so as to face oncoming vehicular traffic. Such a marker is described in Jonnes, U.S. Pat. No. 3,785,719, particularly in FIGS. 6 and 7. The marker is inexpensive, and its elastomeric nature offers several advantageous features — for example, deformation of the marker causes cleaning of the retroreflective surface, even if the retroreflective surface is recessed to protect it from abrasion; and the marker does not transmit the sharp impacts to the paved substrate that rigid markers do.

Despite advantageous features of the described new markers, their use has been limited by the need to apply them by hand. In manual application, areas that are to receive a marker are first cleaned, as by brushing, and the pressure-sensitive adhesive layer on the bottom surface of the marker is pressed onto the cleaned area. Such a manual application is excessively time-consuming, and in many instances, economically prohibitive.

There have been previous proposals for applying pavement markers to a paved surface by automated equipment. For example, see Ten Broeck, U.S. Pat. No. 3,590,701, which describes apparatus for applying ceramic hemispherical pavement markers. But, in general, the previously suggested equipment is complex, large, and expensive. Further, it is not adapted for use with markers as taught in Jonnes, U.S. Pat. No. 3,785,719.

SUMMARY OF THE PRESENT INVENTION

The present invention provides inexpensive automated equipment that is useful to apply a variety of pavement markers including those disclosed in Jonnes, U.S. Pat. No. 3,785,719. Briefly, an applicator of the invention comprises:

- A. a frame;
- B. wheel means supporting the frame and adapted for rolling engagement with the paved surface;
- C. a magazine supported by the frame and adapted to receive and hold a stack of pavement markers with an end pavement marker in the stack positioned at an opening in the magazine;
- D. picker means mounted on the frame and comprising a movable support means and a gripping means attached to the movable support means, said picker means being adapted to move through a cycle of movement that includes,
 1. gripping of said end pavement marker by the gripping means,
 2. movement of the support means to carry the gripping means and the end pavement marker from the opening in the magazine to a point adjacent the wheel means so as to present the pavement marker into wedging contact between the

wheel means and the paved surface, whereupon the pavement marker is pressed against the paved surface by the wheel means and pulled from the gripping means; and

3. return movement of the support means and gripping means to the point of origin of the cycle of movement; and
- E. drive means for moving the picker means through a cycle of movement.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an applicator of the invention, hitched behind a truck that pulls the applicator;

FIG. 2 is a top view of the applicator shown in FIG. 1;

FIG. 3 is a side elevation view of the applicator shown in FIG. 1;

FIGS. 4 and 5 are side elevation views of the applicator shown in FIG. 1, showing parts of the applicator at different stages of operation;

FIGS. 6, 7 and 8 are close-up views of apparatus in the applicator of FIG. 1 for gripping pavement markers, FIG. 6 being a plan view, and FIGS. 7 and 8 being sectional views that are taken along the lines 7—7 in FIG. 6 and show the apparatus at different stages of operation;

FIGS. 9, 10 and 11 are close-up views of a magazine for pavement markers that is part of the applicator of FIG. 1, FIG. 9 being a side elevation view, with parts broken away; FIG. 10 being a back elevation view; and FIG. 11 being a bottom view;

FIG. 12 is a diagram of electric circuitry on the applicator of FIG. 1; and

FIG. 13 is a close-up view of a part of the applicator of FIG. 1, with parts broken away to reveal a drive mechanism of the applicator.

DETAILED DESCRIPTION

An applicator of the invention 10 as shown in the drawings includes a frame 11 on which other parts are supported. In the illustrated applicator 10, the frame 11 comprises a horizontally-disposed box-frame portion, including two longitudinally extending parallel rails 13 and 14 connected by two cross members 15 and 16, and two vertically disposed uprights 17 and 18 attached to the box-frame portion. The longitudinally extending rails 13 and 14 each carry a bearing 19 for an axle 20 on which a wheel 21 is mounted to support the frame for movement along a flat surface. A hitch mechanism 22 for connecting the applicator to a vehicle 23 comprises two bifurcated tongue members 24 and 25 pivotably attached at one end to a vertical bracket 26 that attaches to the vehicle and at the other end to the uprights 17 and 18. A hydraulic shock absorber 27 is pivotably attached to brackets 28 on the bottom tongue member 24 and flexibly attached to a cross plate 29 on the top tongue member 25. The tongue members 24 and 25 may be attached at various pivot points 30 along the uprights 17 and 18 depending on the height of the place of attachment to the vehicle. Although the illustrative applicator 10 is hitched to a pulling vehicle, other applicators of the invention are self-propelled.

Pavement markers 31 are stored in the illustrative applicator 10 in a magazine 32 mounted between the two uprights 17 and 18. As shown best in FIGS. 9–11 the magazine 32 comprises an elongated box having side

walls 33 and 34, a back wall 35, two flanges 36 and 37 that form a split front wall, and an open top 38 through which pavement markers may be inserted. In the illustrative applicator, the pavement markers 31 are inclined-flap markers as shown in FIGS. 6 and 7 of the previously mentioned Jonnes patent, U.S. Pat. No. 3,785,719. The pavement markers 31 are placed in the illustrative magazine in an upside-down alignment, with the top surface of the pavement markers facing downward. In this alignment, a retroreflective flap 39 of the pavement markers, which is inclined upwardly when the pavement marker is on the pavement, is arranged against the back wall 35 of the magazine and points downwardly. A layer 40 of pressure-sensitive adhesive is carried on each pavement marker. The surface of a next-adjacent pavement marker that engages the adhesive layer 40 preferably is treated to have no adhesion to the adhesive layer. (For application of some pavement markers that do not carry a layer of adhesive an applicator of the invention applies adhesive to the paved surface.) The bottom of the magazine 32 is open, but the bottom pavement marker in the stack of markers 31 rests on rollers 41 and 42 disposed at each side of the magazine. The bottom several pavement markers are exposed through an opening 43 at the bottom of the back wall 35.

Pavement markers are removed one at a time from the bottom of the stack in the magazine and applied to the roadway with a picker assembly or means that may be periodically actuated, as will be subsequently described. The picker assembly 45 in the illustrative applicator 10 comprises a support means in the form of two parallel main arms 46 and 47 which are each attached at one end to a main shaft 48 that is rotatably supported in three brackets, 49, 50 and 128. At their other end the main arms 46 and 47 carry a gripping apparatus or means 51, with which the end or bottom pavement marker 31a in the magazine is gripped for removal and transport to the paved surface. The main arms 46 and 47 are moved in marker-applying movement by a crank arm 52 that is attached at one end to a drive shaft 53, a lever arm 54 attached at one end to the main shaft 48 and a linking arm 55 extending between the crank arm 52 and the lever arm 54. The crank arm 52, lever arm 54, and linking arm 55 are normally at rest in the position shown in FIG. 3. When a clutch mechanism 56 (see FIG. 2) is engaged, as will be subsequently described, the crank arm 52 is turned in a counter-clockwise movement as shown in FIGS. 3, 4 and 5. During the first portion of rotation of the crank arm 52, the lever arm 54 and linking arm 55 are driven through the positions shown in FIGS. 4 and 5 to carry a pavement marker 31 in the gripping apparatus 51 to a position wedged between the pavement 57 and the wheel 21. At that time, the pressure of the wheel 21 against the marker 31 pulls the marker from the gripping apparatus and adheres the marker to the paved surface.

Further rotation of the crank arm 52 moves the lever arm 54 in a counter-clockwise direction so as to retract the main arms 46 and 47 of the picker assembly 45 to the position shown in FIG. 3. A tension spring 58 is attached to the main arm 47 so as to assure that the main arms are retracted to their position as shown in FIG. 3.

Upon return movement of the main arms 46 and 47 to the position shown in FIG. 3, the gripping apparatus 51 carried by the main arms is actuated to grip the bot-

tom pavement marker 31a in the magazine. The gripping apparatus 51 comprises a gripping head 60 pivotably mounted on a shaft 61 that extends between the main arms 46 and 47; a linking arm 62 that causes the gripping head 60 to pivot in a clockwise direction (as viewed in FIGS. 4 and 5) during the return movement of the main arms to the position shown in FIG. 3, and which is pivotably attached to a bracket 63 that is fixed to the gripping head and at the other end to the bracket 50 carried on the rail 14 of the base frame; and a cocking element 64 pivotably attached between the main arms 46 and 47. The gripping head 60 comprises a base flange 65 that engages the downwardly facing surface of the retroreflective flap 39 of the bottom pavement marker 31a and a slide 66 located in a groove of a block 67 that is carried on the base flange.

The slide 66 has a downwardly extending flange 68 that is initially engaged by a finger 69 of the cocking element 64 during return movement of the main arms 46 and 47 from the position of FIG. 5 to the position shown in FIG. 3. As the gripping head and cocking element pivot during return movement of the arms 46 and 47, the engagement of the finger 69 with the flange 68 on the slide 66 retracts the slide toward a cocked position. Eventually during the return movement of the main arms and the relative pivoting of the gripping head and the cocking element 64, a trigger plate 70 mounted on the bottom of the flange 65 engages the finger 69 and forces the finger downwardly until the end of the finger disengages from the downwardly extending flange 68 on the slide. In FIG. 7 the slide 66 has nearly reached the cocked position, and the finger 69 has nearly disengaged from the depending flange 68. After disengagement, the slide 66 is advanced, as shown in FIG. 8, by two tension springs 71 attached between a plate 72 that is disposed over a cover plate 73 on the block 67 and an upwardly extending flange 74 on the slide. The slide travels forward until a stop 75 on the slide engages the cover plate 73.

Meanwhile during return movement of the main arms 46 and 47 to the positions shown in FIG. 3, the bottom pavement marker 31a in the magazine has been slightly separated from the next-adjacent pavement marker by a separator mechanism. The separator mechanism includes an L-shaped arm 77 that is attached to a rod 78. The rod 78 is pivotably mounted between two support arms 79 and 80 that are attached to the uprights 17 and 18. A downwardly extending leg 81 of the arm 77 is engaged by the back edge of the gripping head during return movement of the main arms 46 and 47 and is moved in counter-clockwise movement (as viewed in FIGS. 4, 5 and 9). Thereupon a generally horizontally extending leg 82 of the arm 77 (see FIG. 9) compresses a spring 129 that is held between the leg 82 and an arm 83 of a presser 84 that is pivotably attached to the support arms 79 and 80. The spring is held in place between the leg 82 and arm 83 by a floating pin 130 that is slidably held in apertures in the leg 82 and arm 83. Pressure of the spring 129 by the leg 82 pivots the presser in clockwise movement (as viewed in FIG. 9). As the presser 84 is pivoted, fingers 85 on the presser engage the backwardly facing edge of the retroreflective flap 39 of the bottom pavement marker and push the flap away from the next-adjacent pavement marker.

Subsequently the base flange 65 of the gripping head 60 engages the downwardly facing surface of the retroreflective flap 39, and the slide 66 travels forward to

grip the flap between the slide and the base flange. The base flange 65 is apertured at 86, and spring-fingers 87 press through the apertures so as to tightly grip the flap 39 of the pavement marker. Upon downward movement of the main arms 46 and 47 the gripping apparatus will carry the bottom pavement marker 31a out of the magazine past the rollers 41 and 42 and down to the paved surface. The pavement marker adjacent to the removed pavement marker then moves by gravity in the generally vertically disposed magazine 32, dropping into the position vacated by the removed marker. In some embodiments the stack of pavement markers is spring-loaded to take the place of, or to assist, gravity.

During downward movement of the main arms 46 and 47 the gripping head 51 and cocking element 64 pivot. Pivoting of the cocking element is caused by a tension spring 88 that extends between a short arm 89 on the cocking element and the plate 72. During this pivoting movement, the finger 69 is returned to engagement with the downwardly extending flange 68 of the slide 66.

The illustrative applicator 10 includes a movable brush 91 that is applied to the paved surface 57 during a cycle of marker-applying movement by the picker assembly to clean the area of the paved surface that is to receive a pavement marker. The brush 91 is rotatably mounted on a shaft 92, which in turn is fixed to the end of a carrier arm 93 that is pivotably attached to a bracket 94. The carrier arm 93 is normally held in the position shown in FIG. 3 by a tension spring 95, but is moved counter-clockwise (as viewed in FIGS. 3-5) against the tension of the spring by depressing mechanism that is actuated in sequence with movement of the picker means. The depressing mechanism includes a pivot arm 96 that is attached to the main shaft 48 and accordingly pivots back and forth during the partial back-and-forth rotation of the main shaft caused by rotation of crank arm 52 and consequent movement of the lever arm 54 and linking arm 55; a push rod 97 pivotably attached to the end of the pivot arm 96 and slidably mounted in a cylinder 98; an L-shaped arm 99 pivotably attached to a bracket 100; and a press rod 101 that rests against the carrier arm 93. Upon rotation of the pivot arm 96 as shown in FIGS. 4 and 5, the L-shaped arm 99 is rotated to cause the press rod 101 to press the brush against the paved surface. A compression spring 102 supported between an end wall of the cylinder 98 and the push rod 97 assures that the brush is not pressed against the paved surface with too much force, permits movement of the brush 91 for high spots in the paved surface, and allows for wear of the brush. The brush 91 is driven in rotary movement (clockwise direction as viewed in FIGS. 4 and 5) by a drive belt 103 that extends around a pulley 104 mounted on a drive shaft 105 and a pulley 106 that is coaxially attached to the brush 91.

A cycle of marker-applying movement by the picker assembly 45, including the previously mentioned actuation of the clutch mechanism 56, is initiated by a timing means. This timing means includes a sensing switch 108 (See FIG. 13) having a switch arm 109 that is engaged by a striker 110 on a chain 111. The chain travels around a sprocket wheel 112 attached to the axle 20, a sprocket wheel 113 rotatably mounted on the drive shaft 53, an idler sprocket wheel 107 rotatably mounted on main shaft 48, and a sprocket wheel 114 on the brush-driving shaft 105. Since the chain 111 is

driven by the wheel 21, the switch arm 109 is actuated at intervals that represent a preselected distance of travel along the paved surface. This preselected distance may be adjusted by changing the dimensions of the sprocket wheels 112, 113, 107 and 114, chain 111, wheel 21, etc.

As shown in FIG. 12, the sensing switch 108, which is normally spring-biased to an open condition but is momentarily closed each time the striker 110 engages the arm 109, is connected to a relay coil 115 so as to momentarily energize the coil each time the striker 110 engages the switch arm 109. The relay coil 115 is connected to a wiper arm 116 of a stepper switch (mounted on control box 133; see FIG. 1) so as to advance the arm 116 one step from one common contact 117 to a next common contact 117 each time the sensing switch is actuated. A selector switch 118 may be rotated to make connection to a different one of the common contacts 117. When the wiper arm 116 has rotated to register with a common contact 117 connected to the selector switch 118, an electrical circuit is completed simultaneously through a relay coil 119 that resets the wiper arm 116 to its "zero" position, and through a relay coil 120 that thereupon closes a normally open holding switch 121. Thereupon electric power is supplied through the electric leads 122 and 123 to the clutch mechanism 56. With the clutch energized, the rotation of the sprocket wheel 113 is applied to rotate the drive shaft 53 and crank arm 52.

A cycle termination switch 124 mounted on the bracket 128 has a switch arm 125 that is engaged by a cam 131 fixed to the drive shaft 53 once each rotation of the shaft 53. The switch 124 is normally closed as shown in FIG. 12 but is momentarily opened when the cam 131 engages the switch arm 125. Upon the opening of the switch 124 the relay coil 120 is deenergized and the holding switch 121 opens to interrupt power to the clutch.

A marker-applying cycle of movement of the picker assembly can also be initiated by closing a normally open push-button switch 132 mounted on the control box 133 which completes power to the clutch 56 and at the same time energizes the relay coil 119 to return the wiper arm 116 to its zero position. Closing the switch 132 also energizes the relay coil 120 to close the holding switch 121 and assure that the clutch remains energized for a full rotation of the drive shaft 53.

A governor 134 is desirably included in the illustrative applicator to prevent the picker assembly from being activated if the applicator is traveling at too high a speed. The governor 134 includes a pulse counter 135 that receives impulses from the chain-actuated switch 108 through the electric lead 136. If the pulse counter 135 receives pulses at a rate higher than a selected rate, the pulse counter opens normally closed switches 137 and 138. Thereupon the clutch mechanism 56 cannot be actuated either through the stepper switch or by manually operating the push button switch 132.

The electrical circuit on the applicator is supplied electric power by connection through connectors 140 to the battery 141 of the vehicle 23. An on-off switch 142 is used to energize the circuit.

As is apparent from the above description, the drive means for driving the picker means in the illustrated applicator through a cycle of movement is powered by movement of the wheel 21. No auxiliary power source,

such as an internal combustion engine, is needed, though in some embodiments such a power source can be used. However, the absence of auxiliary power means makes the illustrated applicator inexpensive to manufacture and operate, and in that sense the illustrated applicator is preferred.

What is claimed is:

1. An applicator for applying pavement markers to a paved surface, comprising:

- A. a frame;
- B. wheel means supporting the frame and adapted for rolling engagement with the paved surface;
- C. a magazine supported by the frame and adapted to receive and hold a stack of pavement markers with an end pavement marker in the stack positioned at an opening in the magazine;
- D. picker means mounted on the frame and comprising a movable support means and a gripping means attached to the movable support means, said picker means being adapted to move through a cycle of movement that includes,
 - 1. gripping of said end pavement marker by the gripping means,
 - 2. movement of the support means to carry the gripping means and the end pavement marker from the opening in the magazine to a point adjacent the wheel means so as to present the pavement marker into wedging contact between the wheel means and the paved surface, whereupon the pavement marker is pressed against the paved surface by the wheel means and pulled from the gripping means; and
 - 3. return movement of the support means and gripping means to the point of origin of the cycle of movement; and
- E. drive means for moving the picker means through a cycle of movement.

2. An applicator of claim 1 in which the movable support means comprises an arm pivotably attached at one end to a shaft and adapted to move between a first position in which the other end of the arm is adjacent to the opening in said magazine and a second position in which said other end of the arm is adjacent to the point of contact of the wheel means and the paved surface, and the gripping means is attached to the said other end of the arm for gripping said end pavement marker in the stack and removing the gripped pavement marker from the stack upon movement of the arm from its first position to its second position.

3. An applicator of claim 2 in which a separating means is engaged by the picker means during movement of the arm from its second position to its first position to cause the separating means to press against the end pavement marker and separate said end pavement marker from the next-adjacent pavement marker.

4. An applicator of claim 2 in which said gripping means comprises a gripping head that is pivotably mounted on said other end of the arm and comprises a flange that engages one surface of the pavement marker and a slide that is substantially parallel to the flange and is movable between cocked and extended positions, and means for moving the slide to its cocked position while the flange engages the one surface of the pavement marker and for moving the slide to its extended position after the flange has engaged the one surface of the pavement marker so as to grip the pavement marker between the flange and the slide.

5. An applicator of claim 4 in which the means for moving the slide to its cocked position comprises a pivotable cocking element that has a finger adapted to engage a flange on the slide, and the cocking element pivots during movement of the arm from its second position to its first position, causing the finger to first press the slide to the cocked position and then disengage from the flange to release the slide for movement from its cocked position to its extended position.

6. An applicator of claim 1 in which the magazine is mounted in a generally vertical position and said opening in the magazine is at the bottom of the magazine so that when an end pavement marker is removed from the magazine the next-adjacent pavement marker moves by gravity to replace the end pavement marker.

7. An applicator of claim 1 including timing means for periodically activating the drive means to cause a cycle of movement of the picker means.

8. An applicator of claim 7 in which said timing means comprises a switch; striker means driven in proportion to movement of the applicator along the paved surface and adapted to actuate the switch periodically during said travel; accumulating means for counting said actuations of the switch and for completing an electric circuit upon attainment of a predetermined number of actuations of the switch; and a clutch means actuated upon completion of said electric circuit to connect the drive means to the picker means.

9. An applicator of claim 1 in which a brush is mounted on carrier means that are movably attached to the frame so that the brush is normally held above the paved surface; the carrier means being movable so as to press the brush into contact with the paved surface in the path of the wheel means to clean the area of the paved surface that is to receive the pavement marker; and the carrier means being connected to the drive means so as to move the brush into contact with the paved surface in synchronism with a cycle of movement of the picker means.

10. An applicator for applying pavement markers to a paved surface, comprising:

- A. a frame;
- B. wheel means supporting the frame and adapted for rolling engagement with the paved surface;
- C. a magazine supported by the frame in a generally vertical position and adapted to receive and hold a stack of pavement markers with a bottom pavement marker in the stack positioned at an opening at the bottom of the magazine;
- D. picker means mounted on the frame and comprising
 - 1) an arm pivotably attached at one end to a shaft and adapted to move between a first position in which the other end of the arm is adjacent to the opening in said magazine and a second position in which said other end of the arm is adjacent to the point of contact of a wheel of the wheel means and the paved surface, and
 - 2) a gripping means having gripping elements that may be opened and then closed to grip the bottom pavement marker in the stack, said picker means being adapted to move through a cycle of movement that includes,
 - 1. gripping of said bottom pavement marker by the gripping means,
 - 2. movement of the arm from its first position to its second position so as to remove the bottom pavement marker from the stack and present it into wedging contact between said wheel of the wheel

means and the paved surface, whereupon the pavement marker is pressed against the paved surface by the wheel and pulled from the gripping means; and

3. return movement of the arm and gripping means to the point of origin of the cycle of movement;

E. drive means for moving the picker means through a cycle of movement; and

F. timing means for periodically activating the drive means to cause a cycle of movement of the picker means.

11. An applicator of claim 10 in which said gripping means comprises a gripping head that is pivotably mounted on said other end of the arm and comprises a flange that engages one surface of the bottom pavement marker in the stack and a slide that is substantially parallel to the flange and is movable between cocked and extended positions, and means for first moving the slide to its cocked position while the flange engages the one surface of the bottom pavement marker and then moving the slide to its extended position so as to grip the bottom pavement marker between the flange and the slide.

12. An applicator of claim 11 in which the means for moving the slide to its cocked position comprises a pivotable cocking element that has a finger adapted to engage a flange on the slide, and the cocking element pivots during movement of the arm from its second position to its first position, causing the finger to first

press the slide to the cocked position and then disengage from the flange to release the slide for movement from its cocked position to its extended position.

13. An applicator of claim 10 in which said timing means comprises an electric switch; striker means driven in proportion to movement of the applicator along the paved surface and adapted to actuate the switch periodically during said travel; accumulating means for counting said actuations of the switch and for completing an electric circuit upon attainment of a predetermined number of actuations of the switch; and a clutch means actuated upon completion of said electric circuit to connect the drive means to the picker means.

14. An applicator of claim 10 in which a separating means is engaged by the picker means during movement of the arm from its second position to its first position to cause the separating means to press against the end pavement marker and separate said end pavement marker from the next-adjacent pavement marker.

15. An applicator of claim 10 in which the bottom pavement marker in the stack rests on spaced rollers disposed so as to engage side areas of the downwardly facing surface of the bottom pavement marker, and the bottom pavement marker is drawn between the rollers when the marker is removed from the stack by the picker means.

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