Dec. 9, 1969 T. J. McMULLEN, SR., ET AL 3,483,064

ADHESIVE TAPE APPLICATOR

Filed Jan. 9, 1967

FIG. 1

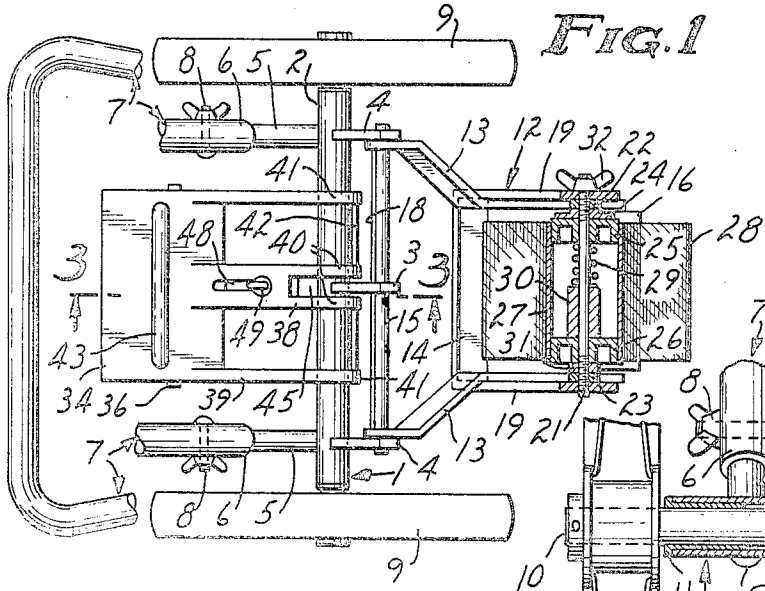


FIG. 4

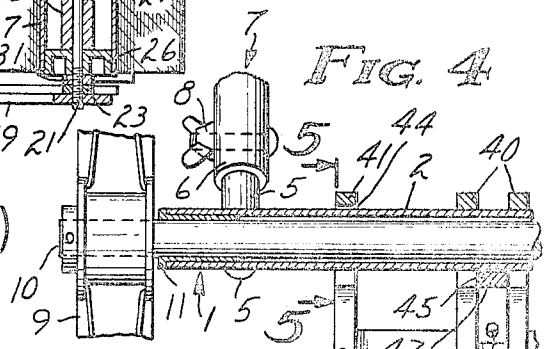


FIG. 2

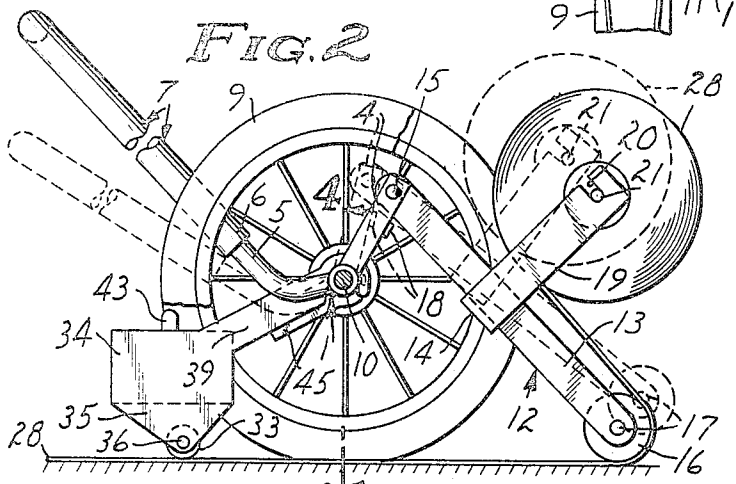


FIG. 5

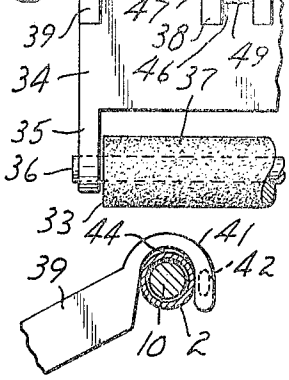
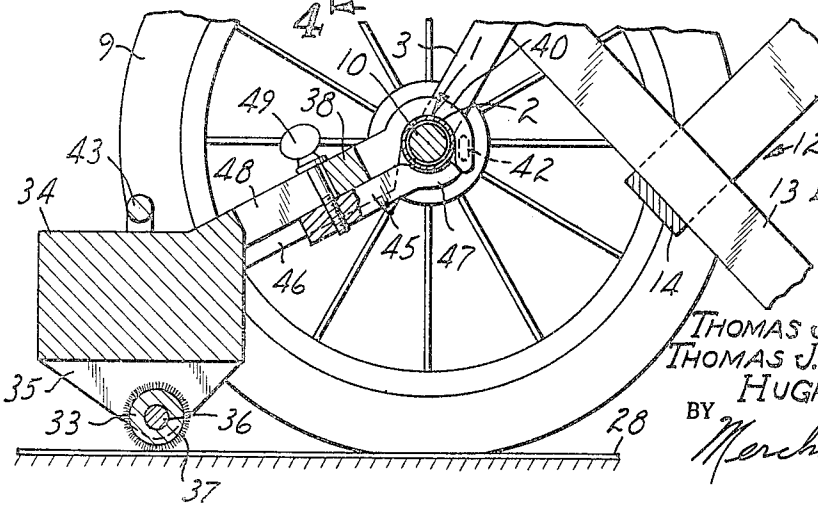


FIG. 3



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ADHESIVE TAPE APPLICATOR

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ABSTRACT OF THE DISCLOSURE

A wheel mounted mobile frame having an adhesive tape roll carrier pivotally mounted thereon, a ground-engaging tape applicator roll journalled in the carrier forwardly of the frame supporting wheels, and rotary tape roll mounting means including cooperation friction elements for retarding tape dispensing rotation of a tape roll mounted thereon. A weighted tamper roll is disposed in trailing alignment with the applicator roll for pressing dispensed tape firmly to the ground traversed by the frame.

Specifically, the present invention is utilized for the laying, on pavement or the like, elongated strips of tape for temporary traffic control, as by the marking of vehicular or pedestrian traffic lanes, parking areas, stopping lines and the like. Such tape is usually provided with a pressure sensitive adhesive surface for engagement with the pavement, and has been heretofore applied to the pavement by equipping a roll of tape with a handle and rolling the tape roll on the pavement, after which the tape is pressed tightly to the pavement by a separate tamping device such as a handle-equipped roller.

One of the objects of this invention is the provision of a tape applicator for the purpose set forth by means of which adhesive backed tape can be quickly and easily applied to ground surface such as a pavement.

Another object of this invention is the provision of a tape applicator having a novel construction which aids in the application of tape in a straight line on smooth or uneven surfaces.

Another object of this invention is the provision of a tape applicator having detachable tape tamping means whereby the tape may be applied to the pavement and pressed into firm adhesion therewith in a single continuous operation.

The above, and still further highly important objects and advantages of this invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, which illustrate the invention, and in which like reference numerals indicate like parts throughout the several views:

FIG. 1 is a fragmentary view in top plan of a tape applicator produced in accordance with this invention, some parts broken away and some parts shown in sections;

FIG. 2 is a fragmentary view in side elevation, some parts being broken away;

FIG. 3 is an enlarged fragmentary transverse section taken substantially on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary view in axial section taken substantially on the line 4—4 of FIG. 2; and

FIG. 5 is a fragmentary section taken on the line 5—5 of FIG. 4.

In the preferred embodiment of the invention illustrated, a rigid frame 1 is shown as comprising a normally horizontally disposed transverse tubular frame member 2, a centrally located radial frame arm 3 and opposite side frame arms 4. The frame arms 3 and 4 are identical, projecting in an upward direction from the tubular frame

member 2, being welded or otherwise secured at their lower ends to the frame member 2. The frame 1 further includes a pair of generally rearwardly projecting frame members 5 that are welded to the tubular frame member 2 adjacent opposite ends of the tubular frame member 2. The frame members 5 are curved to provide upwardly and rearwardly sloping rear ends that are telescopically received in the adjacent ends 6 of a rearwardly and upwardly sloping generally U-shaped handle 7 of metallic tubing or the like. The frame members 5, as well as the handle 7 adjacent the ends 6 thereof, are provided with alignable transverse apertures for reception of wing-nut equipped anchoring screws 8 by means of which the handle 7 is detachably secured to the frame 1.

The frame 1 is supported by a pair of tire-equipped wheels 9 disposed at opposite ends of the tubular frame member 2 and mounted fast on adjacent ends of a rigid axle 10 that extends axially through the tubular member 2 and which is journalled in sleeve bearings 11 in opposite ends of the tubular member 2. Thus, the frame 1 may be swung about the common axis of the wheels 9 and axle 10, as indicated by full and dotted lines in FIG. 2.

A tape roll carrier 12 comprises a pair of laterally spaced legs 13 and a generally U-shaped bracket 14 welded to the legs 13 intermediate their ends. The radially outer end portions of the frame arms 3 and 4 are provided with aligned openings for reception of an elongated mounting rod 15 that is disposed in radially outwardly spaced parallel relation to the tubular member 12, the rod 15 also extending through suitable openings in the rear ends of the carrier legs 13 whereby the carrier 12 is rotatable relative to the frame 1 on the axis of the rod 15. An applicator or pressure roll 16, preferably made of rubber or the like, is journalled to the front ends of the legs 13, by means of a shaft 17, on an axis parallel to the axis of the wheels 9. With reference to FIGS. 2 and 3, it will be seen that the carrier legs 13 slope forwardly and downwardly from the rod 15, the applicator roll 16 operatively engaging the ground ahead of the supporting wheels 9. Stop means limiting downward swinging movement of the carrier 12 relative to the frame 1 comprises a rigid stop bar 18 that is welded to the frame arms 3 and 4 intermediate the ends thereof, the stop bar 18 being adapted to engage the legs 13, as shown by dotted lines in FIG. 2, such as will occur when the handle 7 is swung downwardly to a predetermined degree, thus causing the applicator or pressure roll 16 to be raised out of operative engagement with the ground or pavement.

The bracket 14 includes a pair of laterally spaced parallel carrier arms 19 that extend generally forwardly and upwardly in a direction generally normal to the longitudinal dimension of the carrier legs 13 and which, at their upper end portions are provided with aligned slots 20 for reception of a shaft 21. The shaft 21 is threaded at its opposite end portions to receive nuts 22 and 23, the former of which is adapted to engage an annular clutch elements 24 that is keyed to the shaft 21 for axial sliding movements thereon. The clutch element 24 has frictional engagement with the adjacent end of an annular bushing or the like 25 that cooperates with a second annular bushing element 26 to support the cylindrical core 27 of a roll of wound tape 28, the core 27 being snugly fitted over the bushing elements 25 and 26 for common rotation therewith on the shaft 21. Intermediate the bushings 25 and 26, a coil compression spring 29 and a tubular spacer 30 are mounted on the shaft 21, and a short spacer element 31 is interposed between the bushing element 26 and its adjacent nut 23. The spring 29 yieldingly urges the bushing element 25 into frictional engagement with the clutch element 24 whereby to retard

rotary movement of the roll of tape 28 relative to the shaft 21. The shaft 21 is clamped against rotation in the carrier arms 19 by a wing nut or the like 32 screw threaded on the shaft 21 adjacent the nut 22, the wing nut 32 clamping the adjacent carrier arm 19 therebetween and the nut 22. Frictional engagement between the clutch element 24 and adjacent bushing 25 is adjusted by tightening or loosening either of the nuts 22 or 23 relative to the other thereof.

The tape 28, as it comes from the manufacturer, is wound on the cylindrical core 27 with the adhesive equipped side of the tape disposed radially inwardly. The roll of tape 28 is mounted on the carrier 12 so that the tape is discharged from the rearwardly disposed portion of the roll thereof. The end of the tape 28 is fed over the applicator or pressure roll 16, as shown in FIG. 2, so that the adhesive equipped side thereof engages the ground or pavement under the roll 16. The operator then uses the handle 7 to push the entire device in the desired direction. The retarding effect of the frictional engagement between the clutch element 24 and adjacent bushing 25 causes a downward bias to be imparted to the applicator roll 16 about the axis of the rod 15, whereby to press the tape 28 firmly to the underlying pavement. This downward bias is adjusted by varying the compressive force of the spring 29, as above described. By having the wheels 9 fixed to the common shaft 10, the tape applicator of this invention tends to follow a straight line, even over rough and uneven portions of the pavement.

For the purpose of more firmly pressing the tape 28 into engagement with the underlying pavement, we provide tamper means in the nature of a tamper roll 33 and a relatively heavy weight element 34. The weight element 34 is in the nature of a block of cast metal, such as iron, having laterally spaced depending flange portions 35, the tamper roll 33 being journalled on a transverse shaft 36 mounted in the lower ends of the flange portions 35. Preferably, the tamper roll 33 includes a covering of closely spaced relatively rigid radial bristles 37 which, under bias of the weight element 34, firmly press the tape 28 into engagement with the underlying pavement irrespective of the smoothness or roughness of the pavement surface. The tamper roll 33 is disposed in trailing alignment with the applicator roll 16, the weight element 34 being formed to provide a laterally generally central connector arm 38 and side connector arms 39 laterally spaced from opposite sides of the central connector arm 38. The connector arm 38 is formed at its front end to provide a generally downwardly opening bifurcated hook 40 which straddles the central radial frame arm 3 and has hooking engagement with the tubular member 2, the side connector arms 39 each having their front ends formed to provide downwardly opening hooks 41 that have hooking engagement with the tubular member 2, the hooks 41 each being rigidly connected to the bifurcated hook 40 by transverse bar portions 42. Further, the weight element 34 is provided with a handle 43 by means of which the tamper means may be manually carried independently of the rest of the applicator device. With reference particularly to FIGS. 4 and 5, it will be seen that the bifurcated hook 40 bottoms or rests upon the adjacent portion of the tubular member 2, while the hooks 41 have arcuate bottom surfaces 44 that are normally upwardly spaced from the underlying portions of the tubular member 2. This arrangement permits limited lateral rocking movement of the weight element 34 and tamper roll 33 so that the tamper roll 33 may closely follow the contour of the underlying pavement. The weight element 34 and parts carried thereby are releasably locked in hooking engagement with the tubular member 2 by a hook locking member 45 that is longitudinally slidably received in a longitudinal groove 46 in the central connector arm 38. At its forward end, the locking member 45 is formed to provide a curved tongue 47 that is adapted to underlie the tubular member 2 when the locking member 45 is moved to a forward position on the connector arm 38, as shown in FIG. 3. The connector arm 38 is provided with a longitudinally extending slot 48 for reception of a thumb screw 49 that is screw-threadedly received in a suitable opening in the locking member 45, whereby to lock the locking member 45 in its forwardly disposed locking position of FIG. 3 or in a retracted released position, not shown. Preferably, the tongue 47 is downwardly spaced from the adjacent portion of the tubular frame member 2 suffciently to permit the above mentioned lateral rocking movement of the weight element 34 and parts carried thereby.

With the above arrangement, a strip of tape of any desired length may be quickly and easily laid on a pavement and securely adhered thereto with a single pass of the device over the desired area.

What is claimed is:

1. An adhesive tape applicator comprising:
   (a) a frame,
   (b) a pair of axially aligned frame supporting wheels at opposite sides of said frame,
   (c) an upwardly and rearwardly sloping handle secured to said frame,
   (d) a tape roll carrier having a rear end pivotally connected to said frame on an axis generally parallel to the axis of said wheels, said carrier sloping downwardly and forwardly from its pivotal connection to the frame and having a lower front end normally in close proximity to the ground,
   (e) a ground-engaging applicator roll journalled in the lower front end of said carrier on an axis parallel to the axis of said wheels, and
   (f) means on said carrier for mounting a roll of adhesive tape thereon for rotation on an axis in generally upwardly spaced parallel relation to the axis of said applicator roll, said means including a relatively stationary shaft and a relatively rotary tape roll supporting mandrel, and a pair of cooperating friction elements on said shaft and mandrel for retarding rotation of a roll of tape mounted on said mandrel.

2. The applicator defined in claim 1, characterized by a stop element on one of said frame and carrier and engaging a cooperating portion of the other of said frame and carrier to limit pivotal movement of said carrier in a downward direction relative to said frame.

3. The applicator defined in claim 1 characterized by a horizontally disposed transverse axle journalled in said frame, said wheels being fixed to opposite ends of said axle, said frame being tiltable on the axis of said axle in directions to impart relative movement between said element and its cooperating portion toward and away from each other.

4. The applicator defined in claim 1 in which said frame includes a horizontal transverse tubular member and a plurality of axially spaced radial frame arms extending generally upwardly from said tubular member, the radially outer ends of said frame arms having axially aligned apertures therethrough on an axis parallel to the axis of said wheels, characterized by an elongated rod extending through said aligned apertures, said carrier being journalled on said rod.

5. The applicator defined in claim 4, characterized by an axle extending axially through said tubular member and journalled therein, said wheels being fixed to opposite ends of said axle.

6. The applicator defined in claim 1 in which said carrier includes a pair of forwardly and downwardly sloping legs and a bracket secured to said legs intermediate the ends of said legs, said bracket including a pair of generally upwardly extending arms having upper ends defining a pair of aligned slots therein for reception of said shaft, said shaft being releasably locked in said slots.

7. The applicator defined in claim 1, characterized by tape tamper means including a weight element, a ground-engaging tamper roller journalled in said weight element on a generally horizontal axis parallel to the axis of said wheels, a plurality of connector arms projecting generally forwardly of said weight element, and means for pivotally connecting said connector arms to the frame on an axis generally parallel to the axis of said applicator roll and disposing said tamper roller in trailing alignment with said applicator roll.

8. The applicator defined in claim 7 in which said frame includes a horizontal transverse tubular member and a plurality of axially spaced radial frame arms extending generally upwardly from said tubular member, one of said frame arms being disposed generally centrally between the opposite ends of said tubular member, said means for pivotally connecting said connector arms to said frame comprising, a bifurcated hook on one of said connector arms having hooking engagement with and resting on said tubular member and straddling said centrally disposed frame arm, and hook portions on the others of said connector arms having limited generally vertically movable hooking engagement with said tubular member

in axially spaced relation to said bifurcated hook, whereby to permit limited rocking movement of said tamper means in directions transversely of the direction of movement of said frame.

9. The applicator defined in claim 8, characterized by a hook locking member mounted on said one of the connector arms for movements toward and away from an operative position adjacent said bifurcated hook and tubular member, and means for releasably securing said locking member in desired positions of said movement thereof.

10. The applicator defined in claim 8, characterized by an axle extending axially through said tubular member and journalled therein, said wheels being fixed to opposite ends of said axle.

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