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PAINT DISPENSING PEN

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FIG. 1

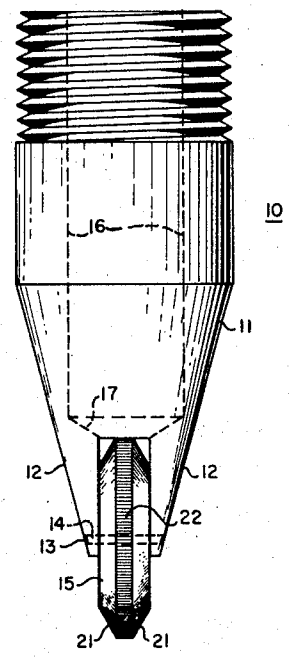
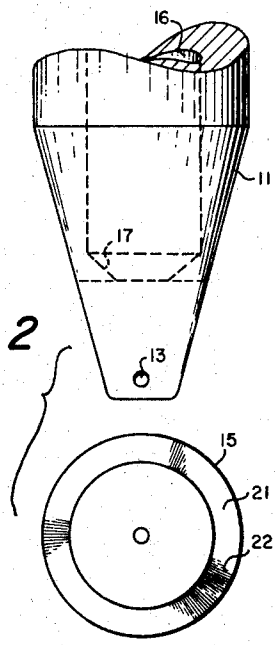


FIG. 2



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ABSTRACT OF THE DISCLOSURE

This invention is directed to a paint dispenser in which a small beveled wheel that is knurled on its circumference and has chamfered sides, is rotatable in a slot cut in the end of a cone that is machined on the end of a short rod. The short rod is provided with an axial passage which permits electrically conducting ink to flow from a marking pen reservoir secured to the upper end of the short rod down to the small wheel rotatable in the opposite end of the short rod. Since the wheel is chamfered on the sides, paint flows down over the side of the wheel onto the center portion thereof which contacts a recording paper upon which the wheel is rotated. Surface tension between the paper and the paint applies paint onto the recording paper such that the center portion of the conductive line applied to the surface is thicker than the outer surface edges of the line.

The invention described herein may be manufactured and used by or for the government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention is directed to a paint striper device and more particularly to a paint dispensing pen which is used for applying a conductive line onto a desired surface.

Heretofore paint methods used in applying conductive lines to a surface have been by use of artist's brushes, drawing instruments, ruling pens, hypodermic needles, spraying brushes and rotatable wheels in which the contacting surface of the rotating wheel is serrated. Some of the previous methods require a high degree of dilution of the conductive paint, which reduces the number of the conducting particles per unit of area and in turn produces a high resistance line. Drawing instruments such as ruling pens used heretofore require considerable skill in applying the conductive line which brings about an appreciable loss of paint. Hypodermic needles used heretofore supply a continuous flow of paint which produces lines which are not desired at times. Also, in use of these systems, rapid settling of conducting particles results in a constantly changing viscosity of the material. Rotary wheels having the circumference thereof serrated produces a line which is not uniform in resistance and produces a very thin layer over the whole width of the line.

The present invention overcomes the disadvantages of the prior art by providing a rotatable wheel in which the sides of the wheel at the circumference thereof are at an angle to the center line through the wheel. Thus, paint is applied by use of the center portion of the circumference of the wheel contacting the paper which then by surface tension applies paint carried by the sides of the wheel such that the center portion of the conductive line applied to the surface is thicker than the outer surface edges of the line. The cross sectional view through the applied line appears as a convex surface, almost semicircular.

It is therefore an object of the present invention to provide a paint dispensing device which will produce a uniform low-resistance line.

Another object is to provide a paint dispensing device in which the resistance line is repeatedly reproducible.

Still another object is to provide a conductive line on a surface in which the centermost portion of the line is thicker in conductive material than the outer edges of the line.

While still another object of the invention is to provide a device which may be used by an unskilled person as well as a skilled operator.

Yet another object of the invention is to provide a paint dispensing device which will produce a narrow, precise, low-resistance line that may be repeatedly reproduced with the same resistance per unit length in each produced line.

Still another object of the invention is to provide a paint-dispensing device which is adaptable for use with any of the well-known commercial marking pen's reservoirs.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the annexed drawing, in which:

FIG. 1 is a view of the conductive paint feeder head and the rotatable wheel which applies the paint onto a surface;

FIG. 2 is a side view of the device as shown in FIG. 1 which illustrates the configuration of the device.

Now, referring to the drawings wherein like reference characters represent like parts throughout the specification, there is shown in FIG. 1 an embodiment made in accordance with the present invention. The device **10**, as shown, is of cylindrical configuration which is threaded at the top thereof to which a suitable reservoir of conductive paint is secured, the reservoir not being shown for simplification of the drawing. The lower end of the cylindrical device is generally of a frusto-conical shape **11** which has a slot milled in the end thereof to provide a pair of spaced jaws **12**. The spaced jaws **12** have apertures **13** bored therein which receive a pin or axle **14** of the paint-applying roller wheel **15**. The paint-applying roller wheel **15** is made substantially the same width as the slot in the frusto-conical shaped end such that paint does not leak between the wheel and the spaced jaws. The feeder head is bored along the axis thereof to provide a passage **16** through which conductive paint is directed to the paint-applying roller. The bottom **17** of the axial passage is sloped toward the slot in the frusto-conical end such that the opening into the passage is the same size as the slot cut into the end thereof. The wheel is provided with an axial hole **18** through which an axle **14** is passed to hold the wheel in place relative to the axial passage **16** bored into the paint dispensing head. The relationship of the holes bored into the spaced jaws is such that the axle **14** will fit thereinto and position the roller wheel adjacent to the opening in the axial hole bored in the feeder head. In order to apply a conductive line of a desired resistance, the paint applying roller wheel is formed of a special design. The wheel is made with a flat outer circumference which may be divided into thirds, with the outer two sections **21** machined or chamfered such that an angle of approximately 30° to 60° is formed between the wheel surface and a line across the circumference of the wheel parallel to the axis of the wheel. The outer circumferential flat portion of the wheel as well as the machined angular surfaces are knurled **22**, on the outer surface thereof. The center section of the roller may be wider than the outer two sections **21**.

Thus when the wheel is assembled in the paint dispenser head, the circumference of the wheel is closely adjacent to the end of the axial passage in the dispenser head and the 30°–60° angular sides of the wheel permit paint to flow downwardly along and below the outer circumference of the wheel along the 30°–60° formed surfaces.

In assembly of the device the cylindrical member is formed with the threads on the outer surface to which a

reservoir is connected and the bottom end is formed into a frusto-conical shape, then the axial passage is bored into the feeder head to the desired depth. The slot is then formed into the frusto-conical end member and the axle holes are then bored into the spaced jaws. The wheel is then formed as described above and placed within the slot of the paint dispenser head, then the axle is inserted through the holes bored into the jaws and through the center of the wheel.

In operation thereof, the paint reservoir is secured to the feeder head portion and then with the device held with the roller wheel downwardly, the paint from a reservoir will flow into the axial passage in the feeder head down to the rotatable wheel member. The device is then moved along the paper with the outer circumference of the wheel flat onto the surface upon which the conductive coating is to be applied.

It has been determined in the past that the surface of a paint applying roller that contacts the painted surface applies the thickest portion of the line. In the present invention the 30°–60° edges on the outer circumference of the wheel and the circumference of the wheel picks up the paint as it rotates by the paint feeder, then the paint is applied to the painted surface as the wheel is rotated thereon. The surface tension between the paint applied by the centermost circumference of the wheel pulls the paint from the angular face sections thereof such that the centermost portion of the line applied to the painted surface is thicker than the outer edges of the line. A cross section through the line indicates that the applied conducting line on the painted surface has a cross-sectional shape of a convex or a somewhat semicircular shape. Thus the paint dispenser device of the present invention applies a conductive strip onto a desired surface wherein the middle portion of the conductive strip is raised above the outermost portion.

The present invention is adapted more for hand operation wherein a line on a paper is traced over with a conductive coating of resistance paint such that the line can be traced with an electronic detector device. However, if desired, the device could be used as a stylus in a recorder by a slight modification, which modification would prevent any paint globules from forming on the outer surface of the wheel where the wheel rotates back into the feeder head. Such a buildup of paint can be easily taken care of wherein the device is used through hand operation.

The present paint dispenser device provides a suitable conductive line on a surface wherein the conductive line

has a particular shape with a uniform resistance throughout the length of the line and a device which can be used repeatedly to produce like lines. Thus the particular design of the pant roller wheel result in the production of a finished line with a specific contour and a specific resistance over a particular length thereof.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. A paint dispensing device which comprises:
a paint dispenser head,
a slot in one end of said dispenser head,
an axial passage within said dispenser head having an outlet adjoining the slot within said dispenser head,
a paint applying roller wheel mounted for rotation within said slot within said dispenser head with a tight fit along the sides and with the circumferential surface of said wheel rotating close to the outlet of said dispenser head,
said paint applying roller wheel including a central flat surface about the circumference thereof with chamfered side surfaces relative to said central flat surface,
said chamfered side surfaces forming an angle of from about 30 degrees to about 60 degrees with a radial plane through the center of said roller wheel,
said central flat surface and said chamfered side surface having aligned side-by-side complementary grooves therein each lying in a plane through the axis and which plane extends along radial lines,
said grooves on said wheel feeding paint to said central surface whereby said central surface of said wheel applies a coating of paint at least the width of the central surface onto a surface to be strip painted,
said coating having a convex cross-sectional shape due to the structure of said roller wheel.

References Cited

UNITED STATES PATENTS

2,165,812	7/1939	Pfleger	15—560 XR
2,768,609	10/1956	Heynau	120—42.2 X

FOREIGN PATENTS

8,628	7/1885	Great Britain.

ROBERT W. MICHELL, *Primary Examiner.*