Nov. 7, 1933. J. M. CHRISTMAN 1,934,405

PAINTING DEVICE

Filed July 11, 1928 2 Sheets-Sheet 1

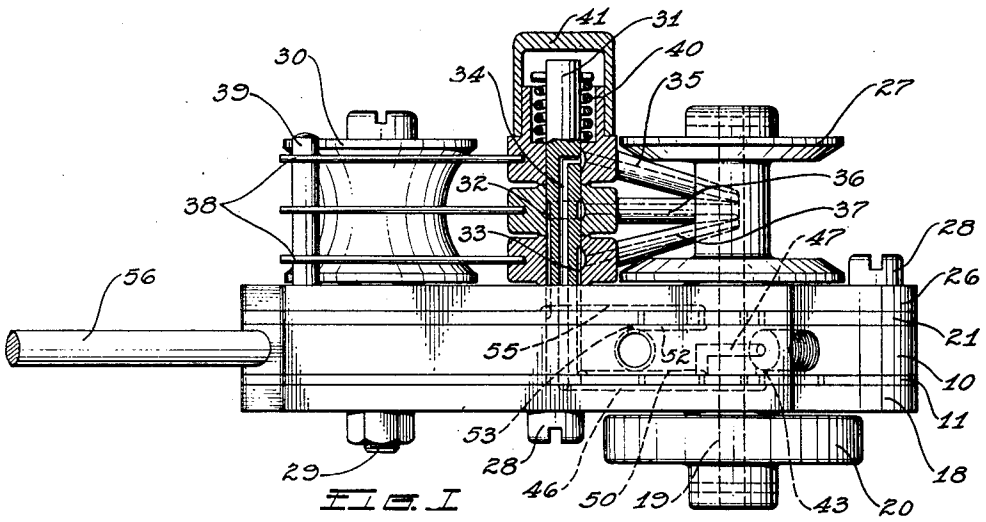


FIG. 1

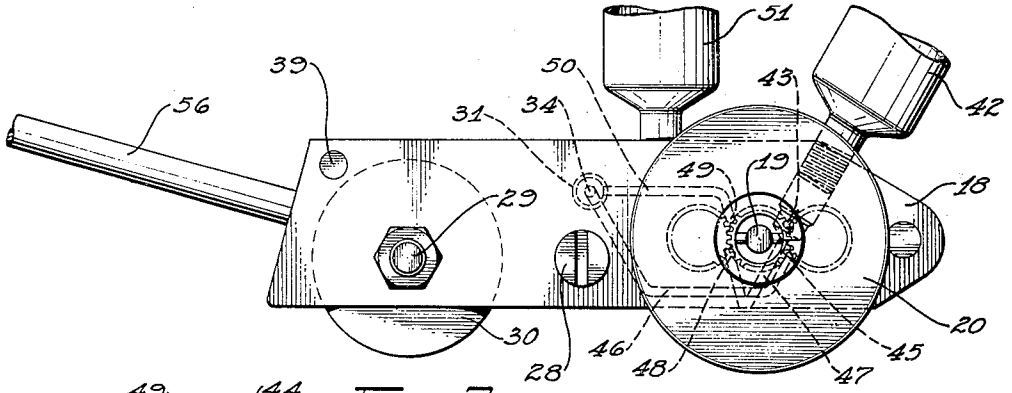


FIG. 2

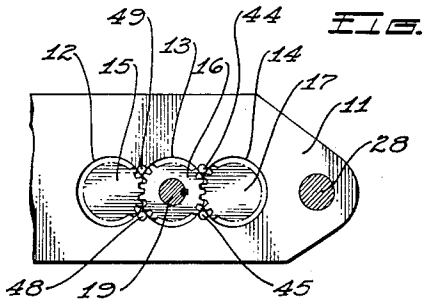


FIG. 3

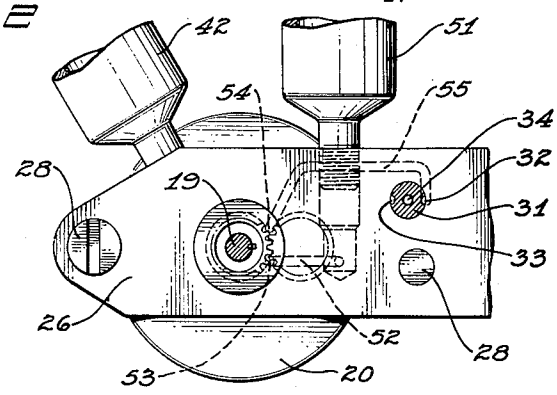


FIG. 5

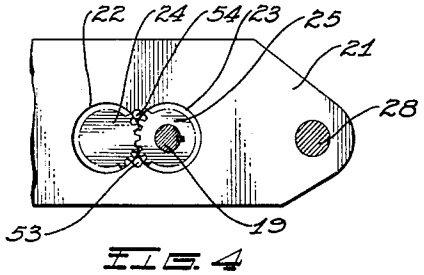


FIG. 4

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PAINTING DEVICE

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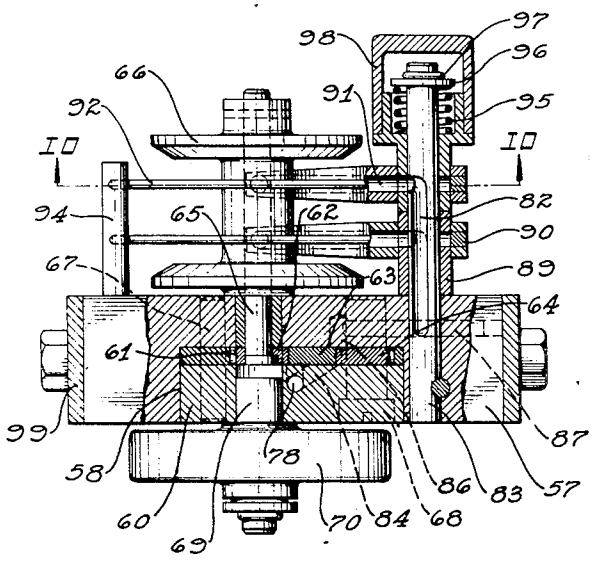


FIG. 6

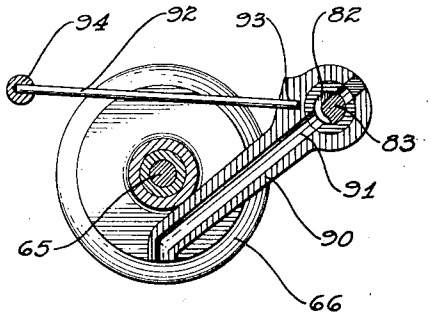


FIG. 10

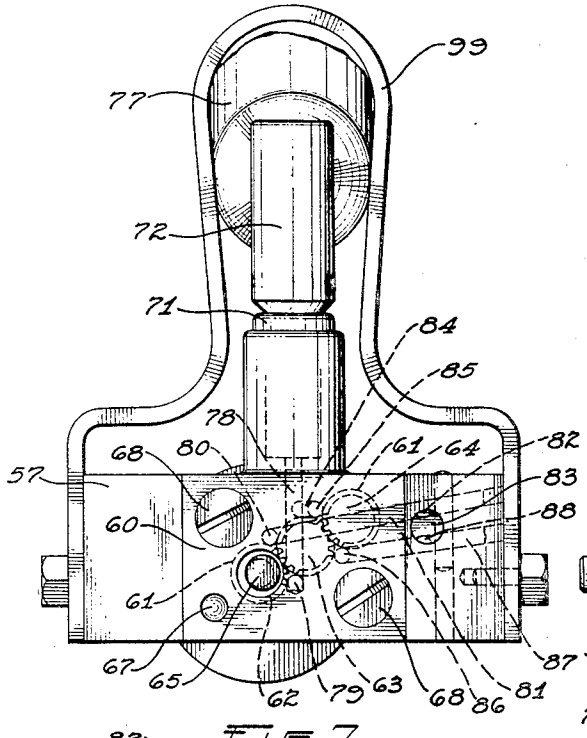


FIG. 7

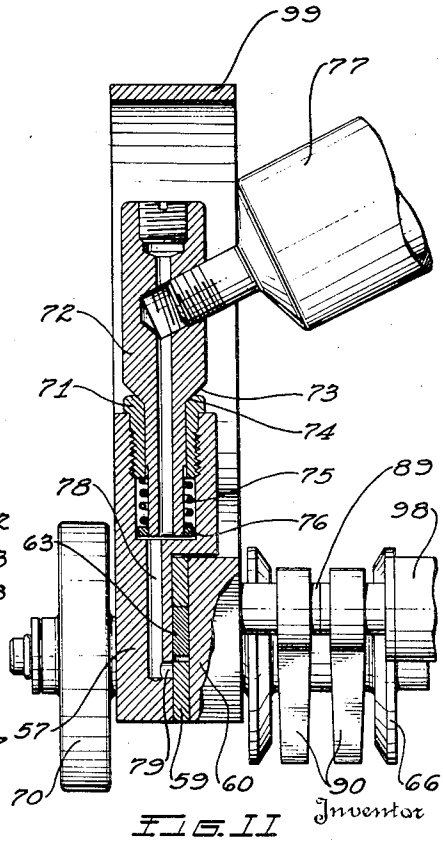


FIG. 11

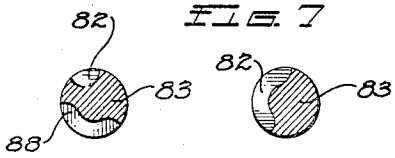


FIG. 8 FIG. 9

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UNITED STATES PATENT OFFICE

1,934,405

PAINTING DEVICE

John M. Christman, Detroit, Mich., assignor to Packard Motor Car Company, Detroit, Mich., a corporation of Michigan

Application July 11, 1928. Serial No. 291,841

14 Claims. (Cl. 91—62.6)

This invention relates to painting devices and more particularly to striping instruments.

An object of the invention is to provide an instrument for painting a plurality of stripes uniformly in width throughout their length.

Another object of the invention is to provide an instrument for painting a plurality of stripes of uniform width on plain or curved surfaces.

Another object of the invention is to provide an instrument for painting a plurality of stripes equally spaced with respect to each other and of uniform width, the instrument comprising means for delivering liquid paint from nozzles at a rate proportionate to the rate of movement of the instrument over the surface under treatment.

A further object of the invention is to provide an instrument for painting two or more stripes concomitantly, each of uniform width throughout their length and parallel with respect to one another and to provide means whereby the stripes may be varied in width according to the fancy of the producer.

A further object of the invention is to provide an instrument for painting a plurality of stripes at one and the same time, the painting of each stripe being independently controlled and the painting thereof being accomplished with rapidity and accuracy.

A still further object of the invention is to provide a striping instrument having a plurality of nozzles each controlled by a separate pump mechanism adaptable for concomitant operation at a rate proportional to the rate of movement of the instrument over the surface under treatment.

Yet a further object of the invention is to provide a striping instrument for painting stripes of two or more colors at one and the same time, the painting of each stripe being controlled by a pump mechanism operated to feed paint through a nozzle in proportion to the rate of movement of the instrument over the surface under treatment.

A still further object of the invention is to provide a striping instrument for painting a plurality of stripes comprising a plurality of pump mechanisms operating concomitantly to feed liquid paint through a plurality of nozzles, each pump delivering paint independently of the other so that interruption to one pump in no way affects the proper functioning of the other.

Yet a further object of the invention is to provide an instrument for painting a plurality of stripes concomitantly, the instrument being highly efficient in operation and yet of marked simplicity as a whole in respect to each of its component parts so that its manufacture is economically facilitated both as regards its parts and their assembly.

Other objects of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which:

Fig. 1 is a top plan view partly in section;

Fig. 2 is a side elevation partly broken away and partly in dotted line;

Fig. 3 is a fragmentary view illustrating the three-gear pump;

Fig. 4 is a similar view illustrating the two-gear pump;

Fig. 5 is a detail view illustrating the two-gear pump and one of the passages leading thereto;

Fig. 6 is a top plan view partly in section, of a modified form illustrating a three-gear pump and two nozzles fed thereby;

Fig. 7 is a side elevation of the form illustrated in Fig. 6;

Figs. 8 and 9 are sectional views of the paint distributing shaft;

Fig. 10 is a sectional view taken on line 10—10 of Fig. 6, and

Fig. 11 is a front elevation partly in section of the modified form shown in Figs. 6 and 7.

Referring by numerals to the drawings, 10 represents a body portion having positioned thereon a plate 11. The plate 11 has three overlapping transverse bores 12, 13 and 14 in which are arranged three very small intermeshing gears 15, 16 and 17 retained in position by a cover plate 18. The center gear 16 is keyed on a shaft 19 extending transversely through the plate 11, the body portion 10 and the cover plate 18. This shaft extends beyond the cover plate to support a drive wheel 20.

Positioned on the opposite side of the body portion 10 is a plate 21 having overlapping transverse bores 22 and 23 in which are arranged very small intermeshing gears 24 and 25 retained in position by a cover plate 26. The gear 25 is keyed on the shaft 19 which extends through the plate 21 and cover plate 26, and supports a guide roller 27 oppositely disposed with respect to the drive wheel 20. The guide roller 27 comprises a substantially spool-shaped roller adapted to engage a bead or other suitable means for guiding the instrument.

The body portion and plates are secured together by suitable screws 28 and positioned in the body portion parallel to the shaft 19 is a shaft

29 having journaled thereon a guide roller 30 in alignment with the roller 27. Positioned intermediate the guide rollers 27 and 30 is a shaft 31 having circumferential longitudinal slots 32 and 33 and an axial bore 34. Mounted on the shaft 31 are nozzles 35, 36 and 37 having passages communicating respectively with the slots 32, 33 and the axial bore 34. The connection between the passages in the nozzles and the slots and bore in the shaft is such that slight rise and fall to the nozzle may be had without closing or partially closing the nozzle. The nozzles are pressed to engage the surface under treatment by springs 38, each having one end secured in the butt of a nozzle and their other ends slidably engaging a pin 39 secured in the plate 26 and projects normally therefrom. The nozzles are secured upon the shaft 31 by a coil spring 40 suitably housed as indicated at 41.

Mounted in the body portion 10 is a container 42 leading from which is a passage 43. This passage communicates with an intake 44 of the three-gear pump, the cooperative outlet of which is indicated at 45 and leading from the outlet 45 is a passage 46 which communicates with the axial bore 34 in the shaft 31, the bore 34 communicating with the passage in the nozzle 35 which is the outside nozzle. Also leading from the container 42 is a passage 47 communicating with an intake 48 of the three-gear pump, the cooperating outlet 49 of which communicates with a passage 50 leading to and communicating with the passage 33 in the circumference of the shaft 31, and this passage communicates with the passage in the nozzle 37 which is the inside nozzle of the group shown.

The arrangement thus far described relates to means for feeding liquid from a container to and through two nozzles, each supplied with an equal quantity of liquid delivered concomitantly at a rate proportionate to the rate of movement of the instrument over the surface under treatment, so that a uniform quantity of paint is ejected through each nozzle, it, of course, being understood that the number of pumps employed is optional and is varied according to the number of stripes it is desired to paint. It is, however, imperative that one pump shall be employed for each nozzle so that the control of each nozzle is independent of the others. By this means uniformity in the stripes is attained and in the event of clogging or other inoperative conditions of one pumping mechanism only one stripe of the number being painted is affected.

Positioned on the body portion 10 is a container 51 leading from which is a passage 52 communicating with the intake 53 of the two-gear pump, the outlet 54 of which communicates with a passage 55 leading to and communicating with the circumferential slot 32 in the shaft 31 which communicates with the passage in the nozzle 36. The nozzle 36 is the central nozzle of the group illustrated.

The nozzles 35, 36 and 37 may be grouped together as shown in Fig. 1 to produce a broad stripe or the nozzles may be equally spaced with respect to each other to produce three parallel stripes each of a uniform width. The spacing apart of the nozzles or the relative position of one to the other is dependent upon the arrangement of stripes desired, all of which is in the discretion of the designer. The adjustment of the nozzles is simply a matter of bending the points thereof to the desired position of the stripe. This particular structure is adaptable for painting stripes of different colors and to accomplish such a result it is only necessary that different colored paints be placed in the two containers provided.

Any form of handle for the instrument may be employed. As shown a shank 56 is secured to the body portion 10 to which a handle, not shown, is attached.

In Figs. 6 to 11 inclusive I have shown a modified form of the invention wherein the body portion comprises a rectangular block 57 slotted as indicated at 58 to receive a plate 59 and a cover plate 60. The plate 59 has therein overlapping transverse bores 61 in which are arranged intermeshing gears 62, 63 and 64, one of which gears, 62, is keyed or otherwise secured on a shaft 65 journaled in the wall of the body portion 57 and extending normally from the side thereof, the shaft having keyed thereon a suitable combination drive and guide roller.

The plate 60 is secured in position by pins 67 and screws 68 or other suitable securing means may be employed and mounted in the plate 60 and projecting normally therefrom is a stub shaft 69 on which is mounted for rotation a suitable roller 70.

Threaded in the body portion 57 is a sleeve 71 having positioned therein a tubular member 72 provided with a shoulder 73 which engages a shoulder 74 in the end of the sleeve, the shoulders 73 and 74 being held in engagement by a coil spring 75 positioned on the inner end of the tubular member 72 intermediate the sleeve 71 and a suitable washer 76 on the end of the tubular member. This structure is such that the tubular member 71 is free to revolve in the sleeve and yet is held sufficiently tight to prevent leakage between the member 72 and the body portion.

Suitably mounted in the member 72 is a container 77 communicating with the passage in the member 72 which in turn communicates with a passage 78 in the body portion. The passage 78 communicates with the intake 79 of a three-gear pump, the outlet of which is indicated at 80. The outlet 80 communicates with a passage 81 leading to and communicating with a circumferential longitudinal slot 82 in a shaft 83 suitably secured in the body portion and normal to the side thereof. Leading from the passage 78 is a short passage 84 leading to an inlet 85 of the pump, the corresponding outlet 86 of which communicates with a passage 87 leading to and communicating with a slot 88 in the circumference of the shaft 83.

Positioned on the shaft 83 are a plurality of sleeves 89, each having mounted thereon a nozzle 90 in which is a passage 91 adapted to communicate respectively with the circumferential slots 82 and 88. The nozzles 90 are spring pressed in engagement with the surface to be treated by means of spring rods 92 having one end pressed in the apertures 93 in the nozzle and the other end engaging an aperture in a suitable support 94.

The sleeves 89 carrying the nozzles 90 are secured on the shaft against displacement by a coil spring 95 positioned on the shaft intermediate the outermost sleeve and a suitable washer 96 secured on the shaft by a pin 97, the spring and washer being suitably housed by a thimble 98. As shown, the instrument is provided with a yoke handle 99. However, any desirable form of handle may be employed for the proper manipulation of the instrument, the character of handle being optional.

The type of instrument illustrated in Figs. 6 to 11 inclusive is employed for painting a plural-

ity of stripes of the same color and, therefore, only one container is employed to feed a plurality of pumps, each controlling the passage of fluid from the container through independent nozzles so that the flow from each nozzle will be uniform and in proportion to the rate of movement of the instrument over the surface to be striped.

Although this invention has been described in connection with certain specific embodiments, the principles involved are susceptible of numerous other applications which will readily occur to persons skilled in the art. The invention is, therefore, to be limited only as indicated by the scope of the appended claims.

Having thus described the various features of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A painting instrument comprising a shaft having circumferential grooves therein, a plurality of nozzles arranged on the shaft having passages communicating with the grooves in the shaft and means for retaining the nozzles in position.

2. A painting instrument comprising a shaft having circumferential grooves and an axial bore, a plurality of nozzles positioned on the shaft having passages communicating with the circumferential grooves and axial bore respectively, means for retaining the nozzles in assembled position and means for pressing the nozzles in engagement with a surface.

3. A painting instrument comprising a shaft having circumferential grooves and an axial bore, a plurality of nozzles on the shaft having passages communicating with the circumferential grooves and axial bore, means for retaining the nozzles on the shaft and means for yieldingly engaging the nozzles with a surface.

4. A painting instrument comprising a body portion, a shaft extending normal from the side thereof, the shaft having a plurality of circumferential grooves and an axial bore, a plurality of nozzles mounted for oscillation on the shaft, the nozzles having passages communicating with the circumferential grooves and axial bore and means for yieldingly retaining the nozzles in engagement with a surface.

5. A painting instrument comprising a body portion, guides therefor, a fixed shaft extending normal from the body portion having a plurality of circumferential grooves and an axial bore, a plurality of nozzles mounted on the shaft having passages therein communicating with the respective grooves and bore and means for yieldingly pressing the nozzles in engagement with a surface, paint containing chambers positioned on the body portion, pump mechanisms connecting the respective paint containing chambers with the circumferential grooves and the axial bore, the pump mechanisms being operated by one of the guides.

6. A striping instrument comprising a shaft having a plurality of ducts therein, a plurality of nozzles mounted on said shaft having paint dispensing passages therein each communicating with one of the shaft ducts, said nozzles having their dispensing ends arranged to engage the surface to be striped, pump means for causing movement of paint through the shaft ducts, and means retaining said nozzles together laterally in a leak-proof relation adjacent the shaft, and a surface engaging roller connected to actuate the pump means.

7. A painting instrument comprising a paint containing chamber, a plurality of nozzles, a separate duct circuit leading from the chamber to each nozzle, a pump mechanism in each duct circuit, and surface engaging roller means connected to actuate the pump mechanisms at a rate proportionate to the rate of the instrument.

8. A painting instrument comprising a source of paint supply, a plurality of nozzles, a separate duct circuit leading from the source of supply to each nozzle, a member for rolling upon the surface to be painted, and a pump mechanism in each duct circuit actuated by rotation of the roller, said pump mechanisms feeding paint through the nozzles at a rate proportionate to the rate of movement of the instrument.

9. A painting instrument comprising a body portion, a plurality of pumps positioned in the body portion, containers carried by the body portion and each connected to the intake of a pump, nozzles carried by the body portion and connected to the outlet of each pump, and a surface engaging roller connected to actuate the pumps concomitantly in proportion to the rate of movement of the instrument across the surface to be striped.

10. An instrument for applying stripes to a surface comprising a body, a paint container carried by the body, a pair of shafts extending from the body, a roller fixed to one of the shafts, pump means in the body connected to be driven by the roller shaft and communicating with the container, a plurality of nozzles pivotally mounted on the other shaft, said nozzle shaft having passages therein in communication with the pump means in the interior of the nozzles, and spring means associated with the nozzles in a relation to hold their dispensing ends against the surface to be striped.

11. An instrument for applying stripes to a surface comprising a body, a pair of shafts extending from the body, a guide roller fixed to one of the shafts, pump means in the body connected to be driven by the roller shaft and in communication with the container, a plurality of nozzles pivotally mounted on the other shaft, said nozzle shaft having passages therein in communication with the pump means and the interior of the nozzles, a support member extending from the body in parallel relation with the nozzle shaft, and spring rods fixed to the support member and engaging the pivoted nozzles in a relation to exert tension thereon in a direction urging the nozzle outlets against the surface to be striped.

12. An instrument for applying stripes to a surface comprising a body, a nozzle pivoted to the body, roller means associated with the body for engaging the surface to be striped, pressure means driven by the roller for moving paint from the body through the nozzle, a support carried by the body, a spring member between the support and the nozzle, said spring means exerting pressure against the nozzle in a direction to hold the dispensing end thereof against the surface traversed by the roller.

13. An instrument for applying stripes to a surface comprising a body, a paint container carried by the body, a pair of shafts extending from the body, a roller fixed to one of the shafts, a pump gear in the body fixed to the roller shaft, a pair of pump elements in the body driven by the gear, a plurality of nozzles pivotally mounted on the other shaft, said nozzle shaft having individual passages therein leading to the interior of each nozzle, and separate duct means in the body establishing communication between the passages in the shaft and the pump elements.

14. A striping instrument comprising a shaft, a plurality of nozzles each having a portion surrounding the shaft and their discharge ends arranged to engage a surface to be striped, a spring for causing the portions of the nozzles adjacent the shaft to tightly engage laterally, and means for feeding paint through the nozzles including pumps and a surface engaging roller connected to operate said pumps.

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