Mar. 3. 1925. 1,528,457

B. O. TILLMAN

PRINTING VEHICLE

Filed March 24, 1924.

Fig. 1

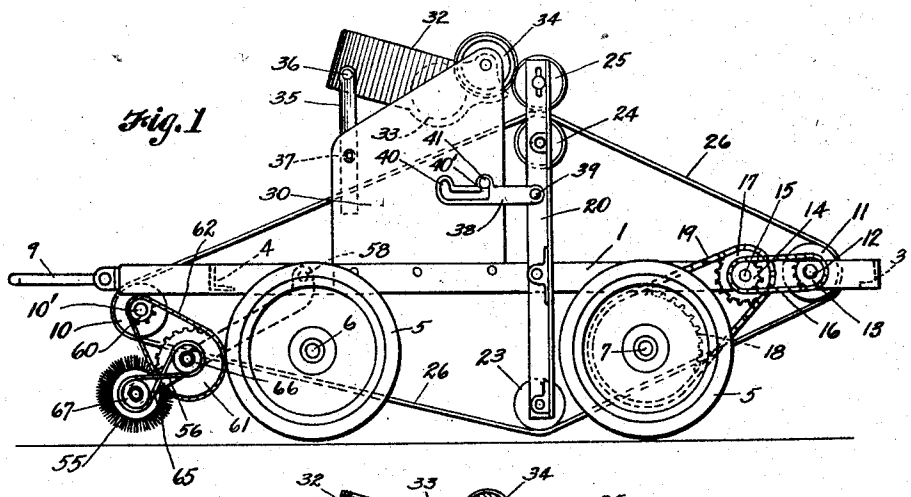


Fig. 2

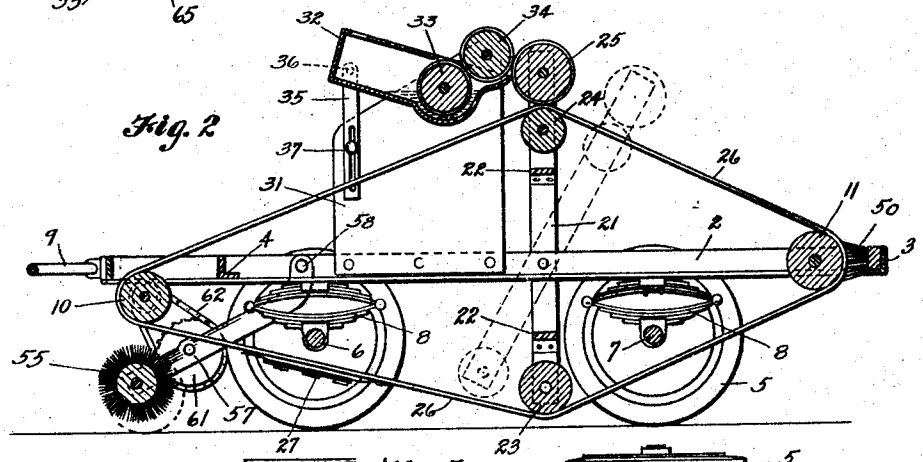


Fig. 3

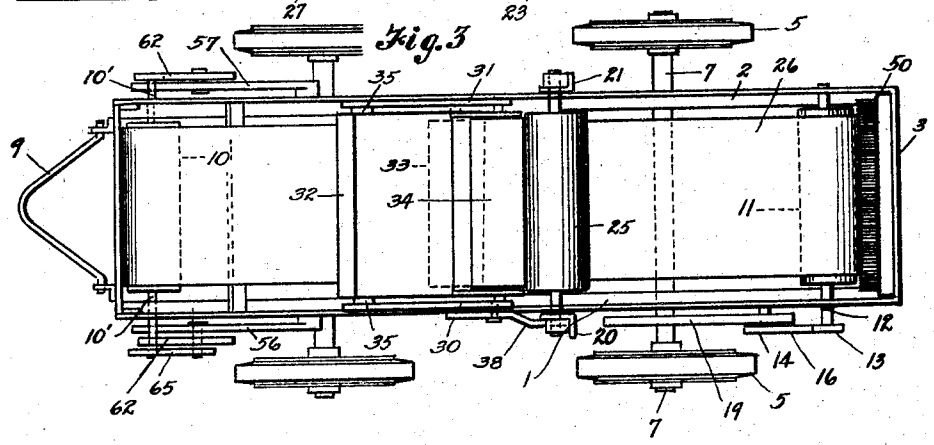
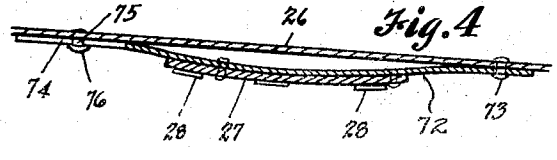


Fig. 4



INVENTOR
BURT O TILLMAN
BY
Richard J. Cook
ATTORNEY

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UNITED STATES PATENT OFFICE.

BURT O. TILLMAN, OF SEATTLE, WASHINGTON.

PRINTING VEHICLE.

Application filed March 24, 1924. Serial No. 701,335.

To all whom it may concern:

Be it known that I, BURT O. TILLMAN, a citizen of the United States, and a resident of Seattle, King County, Washington, have invented certain new and useful Improvements in Printing Vehicles, of which the following is a specification.

This invention relates to improvements in printing devices, and more particularly to a vehicle whereby signs, announcements, characters, etc., may be printed on a road surface.

It is the principal object of the invention to provide a machine for the above purpose comprising a wheeled frame wherein there is a movable belt, with printing characters thereon, that are adapted to be brought by movement of the belt, first, into contact with a means whereby a printing substance, paint or ink, is applied to the characters and then into contact with the road surface so that the print of the characters will be transferred thereto.

Another object resides in the provision of novel means for adjusting the belt into and from printing relation with the road surface and for locking the adjusting means to retain the belt at its different positions.

A still further object of the invention is to provide a flexible printing member and a yieldable mounting whereby it is connected to the belt so that the printing member may yield to compensate for any irregularities in the road surface on which printing is done and which permits its operation about the guide rollers.

Another object is to provide means for sweeping the road surface whereon the printing is to be done.

Other objects reside in the various details of construction and combination of parts, embodied in the invention and in their mode of operation.

In accomplishing these and other objects, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a printing vehicle constructed in accordance with the present invention.

Figure 2 is a central, longitudinal section of the same.

Figure 3 is a plan, or top view of the device.

Figure 4 is an enlarged, detail view of a part of the belt, the printing sheet and its yieldable mounting members.

Referring more in detail to the drawings—

The vehicle frame comprises the two opposite side rails 1 and 2 joined at their rearward ends by a transverse beam 3 and near their forward ends by a transverse beam 4. This frame is supported by means of the four ground wheels 5 mounted on front and rear axles 6 and 7 respectively which are attached to the frame rails 1 and 2 through the intermediacy of springs 8. A tongue, yoke or link, as at 9, may be provided at the front of the frame whereby it may be attached to means for drawing the vehicle along a roadway.

Mounted rotatably at forward and rearward ends of the vehicle are transverse guide rollers 10 and 11; the latter having an axle 12 extending from the frame on which there is keyed a sprocket wheel 13. A similar sprocket wheel 14 is mounted on the frame in alinement with and forwardly of wheel 13 on a stub shaft 15 and extending about these wheels is a chain belt 16. The wheel 14 is fixed to a larger sprocket wheel 17, also rotatable on shaft 15, and alined with a relatively large sprocket 18 mounted to rotate with the axle of the adjacent ground wheel. A chain belt 19 operates about sprockets 17 and 18 to drive the sprockets 17 and 14 and the latter, through chain 16 and sprocket 13 drives the roller 11.

Pivotally supported within the vehicle is a movable frame comprising the opposite side beams 20 and 21 connected rigidly by cross bars 22. Mounted to extend between the lower ends of these beams is a transverse roller 23 and mounted between their upper ends are two spaced rollers 24 and 25. Extended about the rollers 10 and 11 and rollers 23 and 24 is a continuous belt 26 whereon, at suitably spaced intervals, are flexible sheets or plates 27 having printing characters 28 thereon and which are adapted to be brought, by movement of the belt, into contact with the road surface over which the vehicle operates. It will be stated here that the ratio of the several sheets whereby the belt is driven is such that the lower run of the belt will travel rearwardly with respect to the machine at the same rate of travel of the vehicle so that there will be no relative movement between the printing characters and road surface at the time printing is done.

Secured to the opposite side beams 1 and 2 are vertical plates 30 and 31, and pivotally supported between these is a container 32 wherein paint, ink or other printing fluid may be contained. A transfer roller 33 is mounted in the container and this has rolling contact with a transfer roller 34 that is so located as to extend above the container. The transfer roller 25 that is carried by the upper end of the frame beams 20 and 21 is so located as to be engaged by the characters of the printing sheet or plate 27 and also is adapted, when the frame is properly adjusted, to have rolling contact with the roller 34 so that through this series of rollers, paint may be transferred from the container to the characters of the printing plate.

The container 32 may be tilted so as to cause the paint to flow to roller 33 and may be held at different positions by means of supports 35, at its opposite sides, having pivotal connection therewith, as at 36, and a bolt and slot connection, as at 37, with the supporting plates.

When the frame is moved to vertical position, as shown in full lines in Figure 2, the rollers 23 and 24 at its ends, act to tighten the belt so that it will have sufficient frictional contact with the roller 11 to be driven thereby and also the roller 25 will be brought into rolling contact with transfer roller 34 so that the printing fluid will be applied to the characters as they move into contact with roller 25. When the frame is shifted to the position, as shown in dotted lines in Figure 2, the tension on the belt is released so that driving stops. The frame may be held in these two different positions by means of a pair of locking arms 38 that have ends pivotally attached, as at 39, to the side beams of the frame and their opposite ends provided with two sockets 40—40′ adapted to receive pins 41 that are mounted in the supporting plates 30—31.

Secured to the cross beam 3 of the vehicle frame is a brush 50 that engages with the belt as it moves over the roller 11 and brushes the belt and printing plate to remove any foreign matter that may be picked up thereby. I have also provided means for sweeping the road surface at points where the printing is to be done. This means consists of a revolubly mounted roller brush 55 supported by means of two arms 56 and 57 that are pivotally fixed at their upper ends, as at 58, to the opposite side beams 1 and 2. Fixed on the ends of the axle 10′ of roller 10 are small sprocket wheels 60 and mounted eccentrically on the arms 56 and 57 are relatively large sprocket wheels 61. Chain belts 62 operate about the paired sprocket wheels 60 and 61 and, due to the eccentric mounting of the latter wheels, the arms 56 and 57 will be raised and lowered as the wheel rotates to move the roller brush into and from contact with the road surface. The brush is revolved rapidly by a belt 65 that operates about wheels 66 and 67 fixed respectively on the brush axle and to the axle of sprocket wheel 61 as shown in Figures 1 and 3. The gearing ratio in this arrangement would be such and the connection so synchronized with the belt movement that the brush would be lowered to sweep only the road surface whereon the printing was to be done.

The printing member carried by the belt consists of the flexible sheet of rubber or other suitable material 27, see Figure 4, whereon the printing characters 28 are formed. This sheet is removably attached to a flexible spring metal plate 72 that in turn is attached along its forward edge to the belt by means of rivets 73 and which has a series of slots 74 along its opposite edge through which rivets 75, fastened in the belt, extend. The heads 76 of these latter rivets retain the plate connected with the belt but permit slippage of this end in the longitudinal direction of the belt. The plate 72 is curved outwardly from the belt so that the characters of the printing sheet will be pressed into firm contact with the road surface and the resilience of the plate will also compensate for irregularities in the road surface.

Machines of this character could be made in various sizes and could be attached to other propelling vehicles or could be equipped with their own propelling means. The printing plates are adapted to be removed and replaced so that signs, notices, and characters of various form may be used interchangeably.

Such a machine provides for a quick and effective method of applying signs to roadways, pavements and the like and could be used not only as an advertising medium but also as a road mark for the benefit of tourists.

Having thus described my invention what I claim as new therein and desire to secure by Letters-Patent, is:

1. In a machine of the character described, a mobile vehicle, guide rollers mounted in said vehicle, a belt operable about said guide rollers, a container for a printing fluid, a flexible member attached to the belt through the intermediacy of yieldable mounting members, a series of transfer rollers for transferring the printing fluid from the container to the printing characters and means operable to move the belt in accordance with movement of the vehicle to bring the characters of the printing member successively into contact with the transfer rollers and road surface over which the vehicle operates.

2. A device of the character described,

comprising a wheeled frame, a series of guide rollers therein, a belt operable about the rollers having printing character thereon, a container for a printing fluid, transfer rollers for applying printing fluid to the characters, means for driving the belt so that said characters are brought successively into contact with the transfer rollers and road surface, a revolubly driven brush and mechanism operable to raise and lower the brush from and into contact with the road surface to sweep only the surface whereon printing is to be done.

3. A device of the character described comprising a wheeled frame, a series of guide rollers therein, a belt operable about the rollers having printing characters thereon, a container for a printing fluid, transfer rollers for applying printing fluid to the characters, means for driving the belt so that said characters are brought successively into contact with the transfer rollers and road surface, a roller brush, a pair of arms pivotally fixed to the frame at opposite sides and to the ends of said brush, a pair of sprocket wheels fixed on the ends of one of the belt mounting rollers and operated thereby, a pair of larger sprocket wheels eccentrically mounted on said brush supporting arms in alinement with the first named sprockets, means for rotating the brush from the said larger sprocket wheels and sprocket chains operating over said alined sprocket wheels, whereby the eccentric wheels are rotated to cause raising and lowering of the brush from and into contact with the road surface.

Signed at Seattle, King County, Washington, this 27th day of February, 1924.

BURT O. TILLMAN.