Aug. 15, 1950 J. KATZ 2,519,138

ROOF SCRAPING MACHINE

Filed Dec. 6, 1947 2 Sheets-Sheet 1

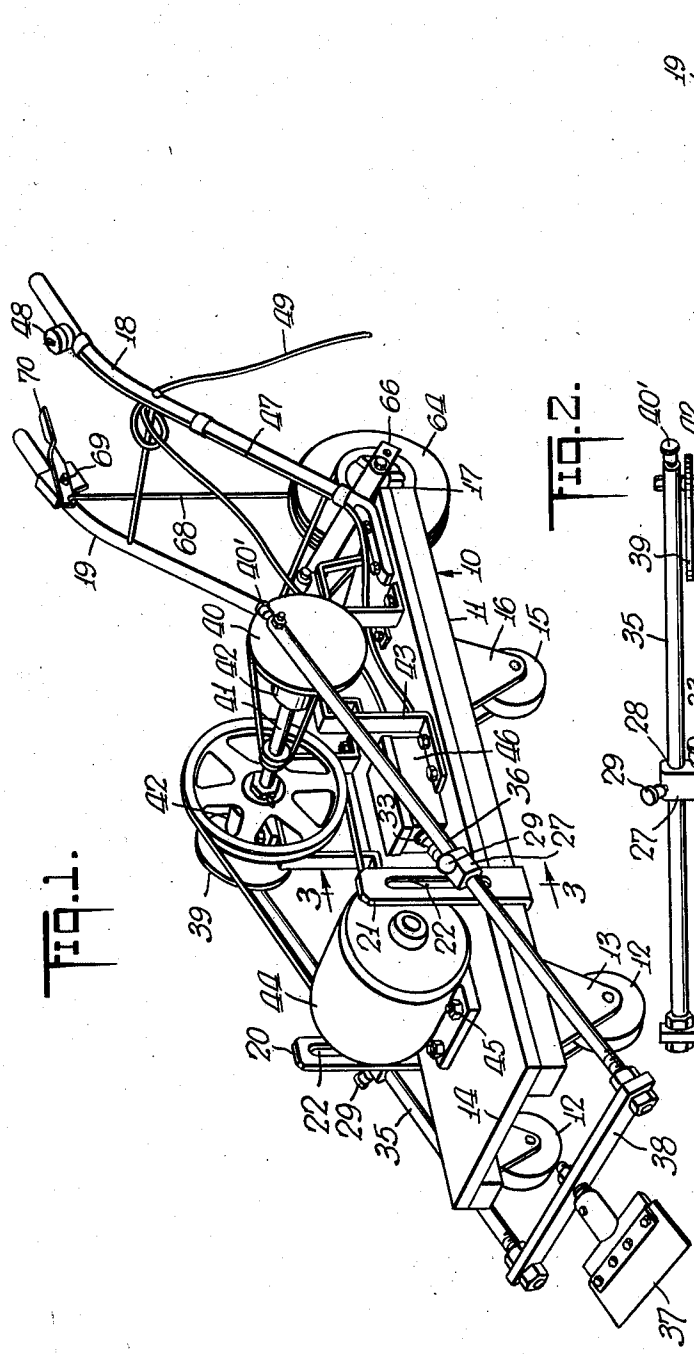


Fig. 1.

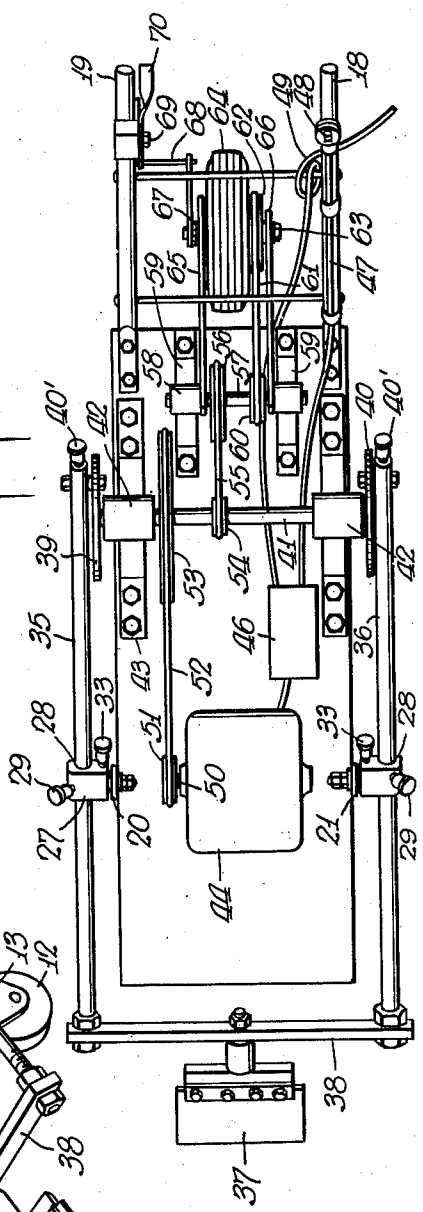


Fig. 2.

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FIG. 3.

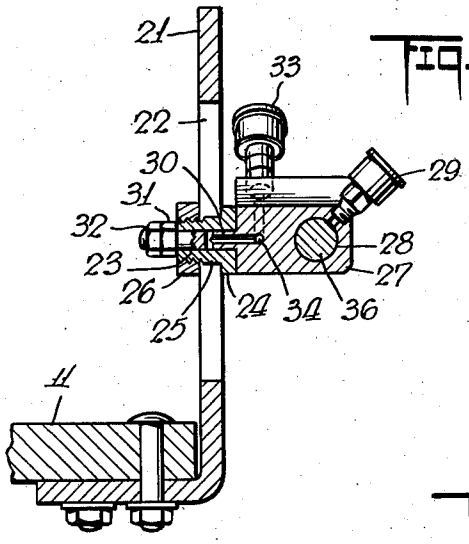


FIG. 4.

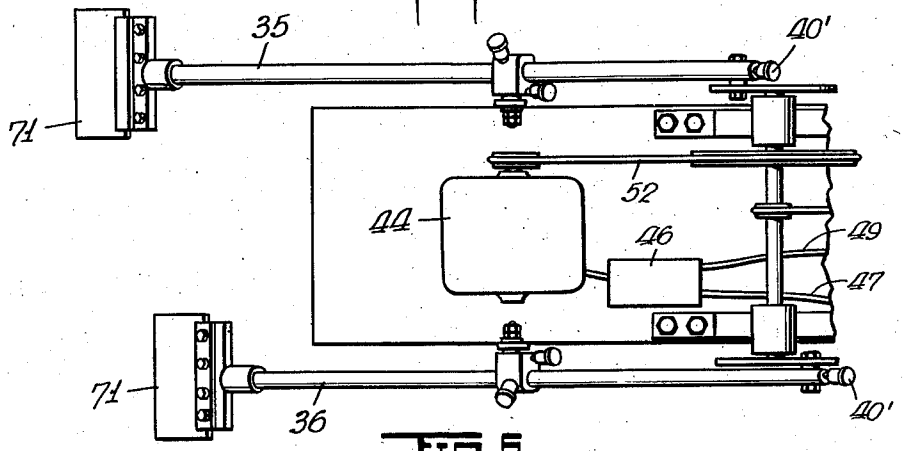
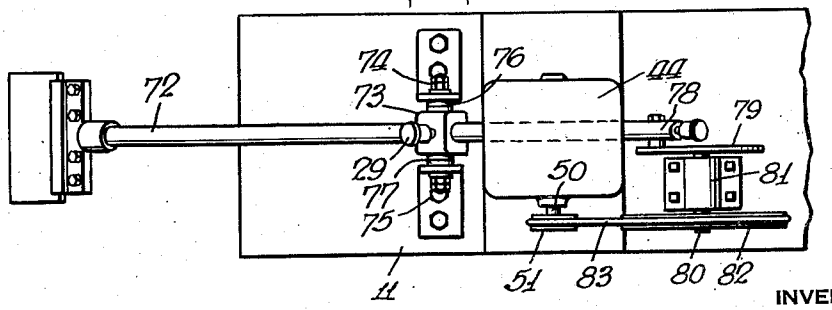


FIG. 5.



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Patented Aug. 15, 1950

2,519,138

UNITED STATES PATENT OFFICE

2,519,138

ROOF SCRAPING MACHINE

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Application December 6, 1947, Serial No. 790,083

3 Claims. (Cl. 262—8)

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This invention relates to a surface treating machine, and more particularly to a roofing machine for loosening and removing the gravel surfacing layer on built-up roofs or for otherwise treating, for example, sweeping, roof surfaces.

Roof surfacing machines heretofore used have involved scrapers mounted on a carriage which is movable along the roof surface. The scraper in its movement back and forth at an acute angle to the horizontal (hereinafter referred to as the angle of inclination) is moved into and out of the surface of gravel, loosening same. As the machine progresses it removes the gravel by pushing it in front of the machine forming a suitable pile. Since different roofs have different thicknesses of gravel surfacing, for efficient removal it is necessary to change the angle of inclination to accommodate these different thicknesses. Furthermore, roofs differ in pitch; a machine having a scraper positioned at one angle of inclination can only be used on a roof of a pitch corresponding to that angle of inclination and cannot be used on roofs of other pitches. To the best of my knowledge and belief no roof scraping machine has been developed prior to this invention in which the angle of inclination can readily be changed to enable the machine to efficiently remove the gravel surfacing on roofs of different pitches or roofs having different thicknesses of gravel surfacing thereon.

It is among the objects of this invention to provide a surface treating machine, such as a roof scraping machine, which is readily adjustable to accommodate roofs of different pitches and roofs having different thicknesses of gravel surfacing.

Another object of this invention is to provide such surface treating machine which is simple in design and efficient in operation.

Other objects and advantages of the invention will be apparent from the following detailed description thereof.

In accordance with this invention a surface treating machine is provided involving a carriage, a support on the carriage, an adjustable bearing member mounted on the support so that this bearing member may be positioned at any desired height; a guide mounted for free rotation on a horizontal axis in this bearing member, a rod or bar movably mounted in this guide, an implement, such as a scraper, mounted on one end of this rod and a power driven crank or other power means for actuating the rod to move it back and forth within the guide and thus project the scraper into the surface being treated and retract it therefrom. To adjust this machine to accommodate different pitches of roofs or different thicknesses of gravel, it is only necessary to raise or lower the adjustable bearing member and thus raise or lower the guide in which the rod moves to position this implement carrying rod at a desired angle of inclination. Since the guide in which the rod moves is freely rotatable, it automatically accommodates itself to the different angles of inclination to which the rod may be moved, guiding the rod in its sliding movement, and this without excessive friction between the guide and the rod, which friction would interfere with satisfactory operation of the machine.

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In the preferred embodiments illustrated on the drawings, the invention is shown incorporated in a roof scraping machine having one or more scrapers carried by one or more movable rods and the description which follows will be confined to the present illustrated embodiments of the invention. It will be understood, however, that the novel features and improvements are susceptible to other applications; for example, instead of scrapers, brushes or other implements may be mounted on the movable rods for sweeping or otherwise treating a desired surface. Hence, the scope of this invention is not confined to the embodiments herein described.

In the accompanying drawings forming a part of this specification and showing for purposes of exemplification preferred forms of this invention without limiting the claimed invention to such illustrative instances:

Figure 1 is a perspective view of a roof scraping machine embodying this invention;

Figure 2 is a plan view of the roof scraping machine of Figure 1;

Figure 3 is a fragmentary vertical section taken in a plane passing through line 3—3 of Figure 1;

Figure 4 is a fragmentary plan view of a modified form of roof scraping machine embodying this invention; and

Figure 5 is a fragmentary plan view of still another modification embodying this invention.

In the drawing 10 indicates a carriage comprising a platform 11 having a pair of wheels 12 rotatably mounted in depending brackets 13 at each of the opposite sides at the front end 14 and a second pair of wheels 15 rotatably mounted on depending brackets 16. Wheels 15 are positioned towards but spaced from the rear end 17 of platform 11, i. e., between the transverse median of the platform 11 and the rear end 17 thereof. One end of a pair of handles 18 and 19 is secured

as by bolting to the rear end of the platform at the opposite sides thereof; the ends of these handles are engaged by the operator to guide the machine and control its operations as hereinafter more fully described.

Bolted or otherwise secured to platform 11 at the opposite sides thereof is a pair of standards 20, 21, each provided with a vertical slot 22. Since the construction of the adjustable guides mounted on these two standards is the same only one will be described in detail. As shown in Figure 3 an adjustable bearing member 23 consists of a collar 24 bearing against one side of standard 21 and having a cylindrical extension 25 passing through slot 22. A collar nut 26 threadedly engages the threaded end of cylindrical extension 25 and with collar 24 forms a clamp for securing the bearing member 23 in any desired vertical position within slot 22. In other words by loosening collar nut 26 the bearing member may be moved up or down within slot 22 and then secured in desired position by tightening collar nut 26.

Mounted for free rotation on a horizontal axis within bearing member 23 is a guide 27. This guide comprises a cylindrical bore 28 which desirably is lubricated by a grease cup 29, and a cylindrical extension 30 rotatably mounted for free rotation on a horizontal axis within bearing member 23. End of cylindrical extension 30 protruding beyond bearing member 23 is threaded and is provided with a nut 31 and lock nut 32 to secure it within this bearing member. A grease cup 33 communicates with a grease channel 34 which provides lubricant for lubricating the contacting surfaces between guide 27 including the cylindrical extension 30 and the bearing member 23.

Mounted for sliding movement within the guides 27 on opposite sides of the machine, as shown in Figures 1 and 2, is a pair of rods or bars 35, 36. A scraper 37 is fastened to one end of these rods; desirably the scraper may be removably secured to the center of a cross bar 38 bolted or otherwise fastened to one end of rods 35, 36. Any desired implement or tool, such as a brush, may replace the scraper so that after the gravel surfacing is scraped the machine may be used to sweep the resultant roof to provide a clean surface for re-roofing, etc. The other ends of rods 35, 36 are suitably fastened to a pair of cranks 39, 40; this connection desirably is lubricated by a grease cup 40' of any well known type. These cranks are keyed to a driven shaft 41 which is rotatably mounted in suitable bearings 42 carried by brackets 43 bolted or otherwise secured to platform 11.

The machine may be actuated and driven in any desired manner. One preferred construction, shown in Figures 1 and 2, involves an electric motor 44 bolted as at 45 to platform 11. This motor is supplied with current through a fuse box 46 which has a line 47 provided with a switch 48 mounted on handle 18 for controlling energization and deenergization of motor 44. A second line 49 leads to any suitable current source.

Armature shaft 50 of motor 44 has keyed thereto a pulley 51 which through belt 52 drives pulley 53 keyed to shaft 41. A pulley 54 keyed to shaft 41 through belt 55 drives a pulley 56 keyed to stub shaft 57 rotatably mounted in bearings 58 carried by standards 59 bolted or otherwise suitably secured near the rear end 17 of the carriage 10. Stub shaft 57 has keyed thereon a second pulley 60 which through belt 61 and pulley 62 drives a shaft 63 on which is loosely mounted a wheel 64, desirably a rubber tired traction wheel. Shaft 63 is mounted for rotation in the lower end of a pair of supports 65, 66 (Figure 2), the upper ends of which are pivotally mounted on stub shaft 57. Thus when the operator bears down on handles 18 and 19, the pivotal mounting of supports 65, 66 for driven wheel 64 permits this wheel to move downwardly while the front end 14 of the carriage and the scraper 37 are raised about intermediate wheels 15 as a pivot. This permits raising of the scraper 37 to clear any obstructions and enables the machine to be manipulated with greater ease.

Traction wheel 64 is placed in driving engagement with driven shaft 63 through a clutch 67 shown diagrammatically and which may be of any well known type. Linkage mechanism 68 pivoted at 69 to handle 19 is provided for actuating the clutch so that the operator by actuating hand lever 70 of this linkage mechanism may, as well known in the clutch art, actuate the clutch 67 to place wheel 64 in or out of driving engagement with driven shaft 63. Since the clutch 67 and the linkage mechanism 68 for operating same may be of any well known type it is believed no useful purpose would be served by describing same in greater detail.

In the operation of the modification of Figures 1, 2 and 3, the operator engages handles 18, 19 and positions the machine to scrape the desired surface, the position of bearing members 23 in slots 22 on standards 20 and 21 having previously been adjusted to dispose rods 35 and 36 at the desired angle of inclination taking into account the pitch of the roof; the thickness of gravel thereon and the desired depth of penetration of scraper 37 into this gravel layer. Switch 48 is then closed energizing motor 44 which through armature shaft 50, pulley 51, belt 52 and pulley 53 drives shaft 41 thus rotating cranks 39 and 40 and moving rods 35, 36 through lubricated bores 28 in the guides 27. The rods thus move the scraper in an elliptical path into and out of the surfacing layer. Since these guides 27 are freely rotatable on a horizontal axis, namely, cylindrical extensions 30 are freely rotatable in the cylindrical bores in bearing members 23, the guides automatically accommodate themselves to the different angles of inclination to which the rods 35 and 36 may be adjusted and this without excessive friction between the rods and bores in the guides in which the rods slide.

As long as the clutch 67 is not actuated to place the driving shaft 63 in driving engagement with traction wheel 64 the machine stands still, the scraper being projected into and withdrawn from the gravel. This feature of the machine is important when working on roofs having compacted portions which require several strokes of the scraper to loosen the same. When the surface has been loosened to the desired extent, the operator actuates the clutch 67 so that wheel 64 is driven through pulley 54 on shaft 41, belt 55, pulleys 56 and 60, belt 61, pulley 62, shaft 63 and clutch 67 moving the carriage 10. The carriage moves forward under the control of the operator, the scraper moving back and forth into and out of the gravel layer and the loosened gravel being pushed in front of the scraper into a pile.

By applying relatively small pressure to handles 18 and 19, platform 11 may be pivoted about wheels 15 as a pivot to an extent such that

scraper 37 is still in contact with the gravel surfacing. In this way the depth of penetration of the scraper 37 into the surfacing layer may be controlled during movement of the machine, so that by tilting platform 11 more or less different thicknesses of surfacing may be removed as the machine progresses over the gravel surfacing.

When it is desired to treat a roof or a substantial portion thereof of different pitch or having a different thickness of surfacing, the angle of inclination of the rods 35, 36 may be changed by loosening nuts 26, properly positioning the bearing member 23 and again tightening these nuts. The adjustable bearing members 23 and the tiltable mounting for the scraper combine to make the machine extremely flexible and efficient in effecting the removal of gravel surfacing from roofs varying in pitch or having different thicknesses of surfacing.

In the modifications of Figures 4 and 5 parts like those hereinabove described in Figures 1, 2 and 3 have been given like reference characters. In Figure 4 instead of a single scraper 37 each of the rods 35, 36 is provided with a scraper 71 individual thereto, so that the machine in operation simultaneously removes two parallel bands of surfacing material.

In the modification of Figure 5 only one supporting rod 72 disposed on the longitudinal median of the machine is employed, instead of the pair of rods 35 and 36 disposed on opposite sides of the machine as in the other modifications. Rod 72 is slidably movable in a guide 73 which has cylindrical extending portions 74, 75 on opposite sides thereof rotatably mounted in adjustable bearing members 76, 77, each corresponding to bearing member 23 hereinabove described in detail. End 78 of rod 72 is suitably fastened to a crank 79 keyed to shaft 80 rotatable in bearing 81. A pulley 82 on shaft 80 is driven by a belt 83 passing over a pulley 51 on armature shaft 50 of motor 44.

The operation of the modifications of Figures 4 and 5 will be evident from the above description thereof taken with the description of the operation of the modifications of Figures 1 and 2.

It will be noted the machine embodying the invention is readily adjustable to accommodate roofs of different pitches and roofs having different thicknesses of gravel surfacing, is simple in design and efficient in operation.

Since different embodiments of the invention could be made without departing from the scope of this invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a roof scraping machine, a carriage, a pair of idler wheels at the front end of said carriage, a second pair of idler wheels at the sides of said carriage between the rear end and the transverse median of said carriage, a driven wheel disposed at the rear end of said carriage, pivoted bracket means on said carriage, said driven wheel being mounted for rotation in said pivoted bracket means, said driven wheel permitting movement of said carriage about said second pair of wheels as a pivot to raise the front end of said carriage, a pair of standards on the opposite sides of said carriage, an adjustable bearing mounted in each of said standards so that it can be fastened thereto in any one of a number of positions at different heights from the floor of said carriage, a guide mounted for free rotation on a horizontal axis in each of said bearings, a rod movable in each of said guides, a single scraper fastened to one end of both of said rods, a motor, a shaft driven by said motor, and a pair of cranks on said shaft, said cranks imparting motion to the other end of said rods to effect movement thereof within the guides.

2. In a roof scraping machine, a carriage, a pair of idler wheels at the front end of said carriage, a second pair of idler wheels at the sides of said carriage between the rear end and the transverse median of said carriage, a driven wheel disposed at the rear end of said carriage, pivoted bracket means on said carriage, said driven wheel being mounted for rotation in said pivoted bracket means, said driven wheel permitting movement of said carriage about said second pair of wheels as a pivot to raise the front end thereof, a pair of standards on the opposite sides of said carriage, an adjustable bearing mounted in each of said standards so that it can be fastened thereto in any one of a number of positions at different heights from the floor of said carriage, a guide mounted for free rotation on a horizontal axis in each of said bearings, a rod movable in each of said guides, a scraper secured to one end of each of said rods, a motor, a shaft driven by said motor, and a pair of cranks secured to said shaft, said cranks imparting motion to the other end of said rods to effect movement thereof within the guides.

3. In a surface treating machine, a carriage, a pair of idler wheels at the front end of said carriage, a second pair of idler wheels at the sides of said carriage between the rear end and the transverse median of said carriage, a driven wheel disposed at the rear end of said carriage, pivoted bracket means on said carriage, said driven wheel being mounted for rotation in said pivoted bracket means, said driven wheel permitting movement of said carriage about said second pair of wheels as a pivot to raise the front end of said carriage, a standard on said carriage, an adjustable bearing mounted in said standard so that it can be fastened thereto in any one of a number of positions at different heights from the floor of said carriage, a guide mounted for free rotation on a horizontal axis in said adjustable bearing, a rod movable in said guide, an implement fastened to one end of said rod, a motor, a shaft driven by said motor, and a crank on said shaft, said crank imparting motion to the other end of said rod to effect movement thereof within said guide.

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The following references are of record in the file of this patent:

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