Jan. 31, 1967 E. A. ZUZELO 3,301,601

VERTICALLY ADJUSTABLE WHEEL SUPPORTED CONCRETE SAW

Filed Sept. 8, 1964 3 Sheets-Sheet 1

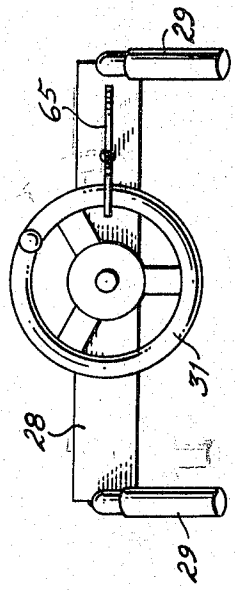


Fig. 6.

Fig. 1.

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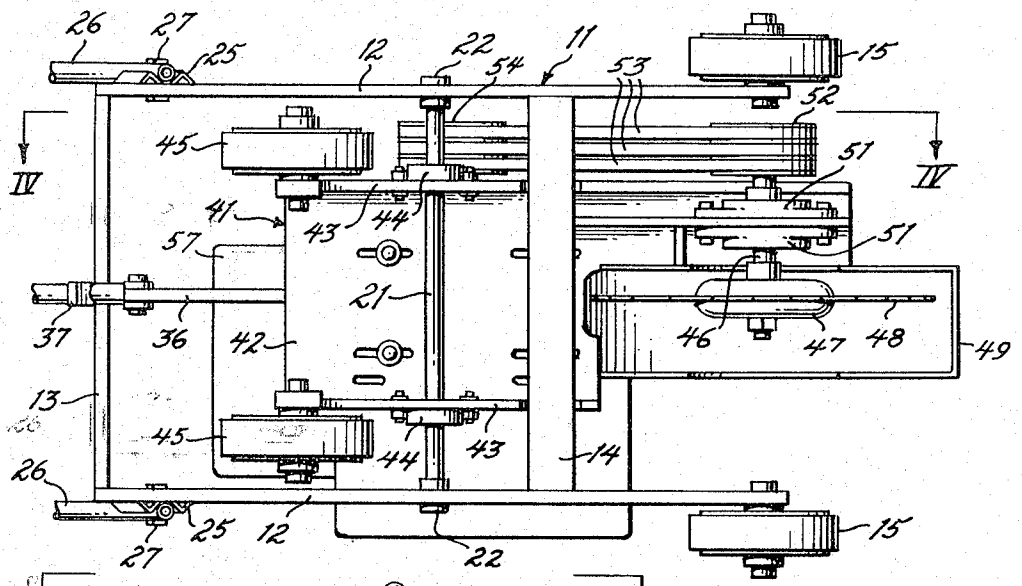


Fig. 2.

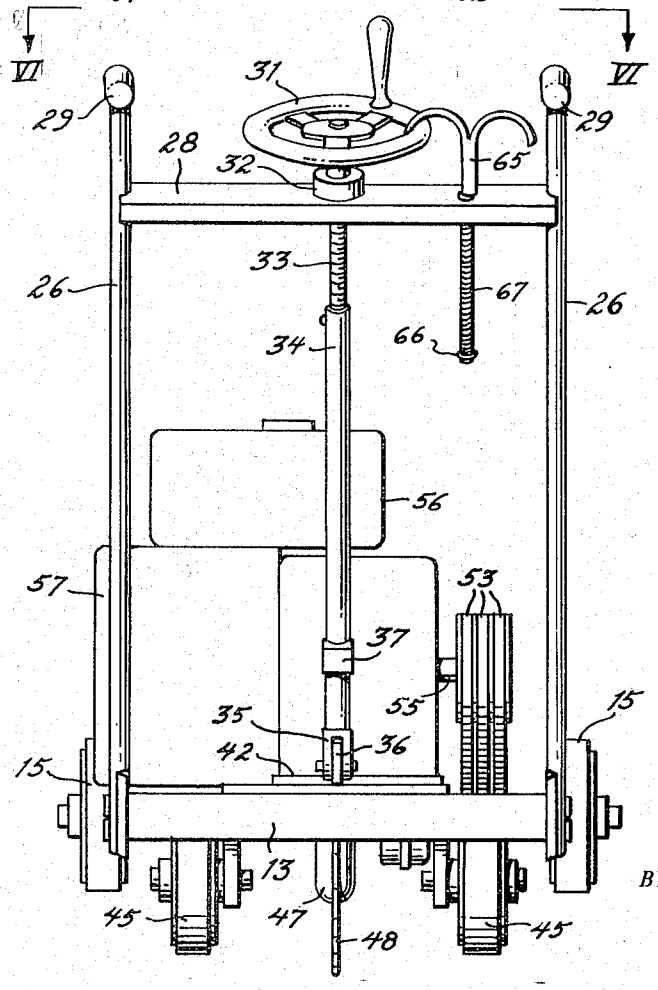


Fig. 3.

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Filed Sept. 8, 1964 3 Sheets-Sheet 3

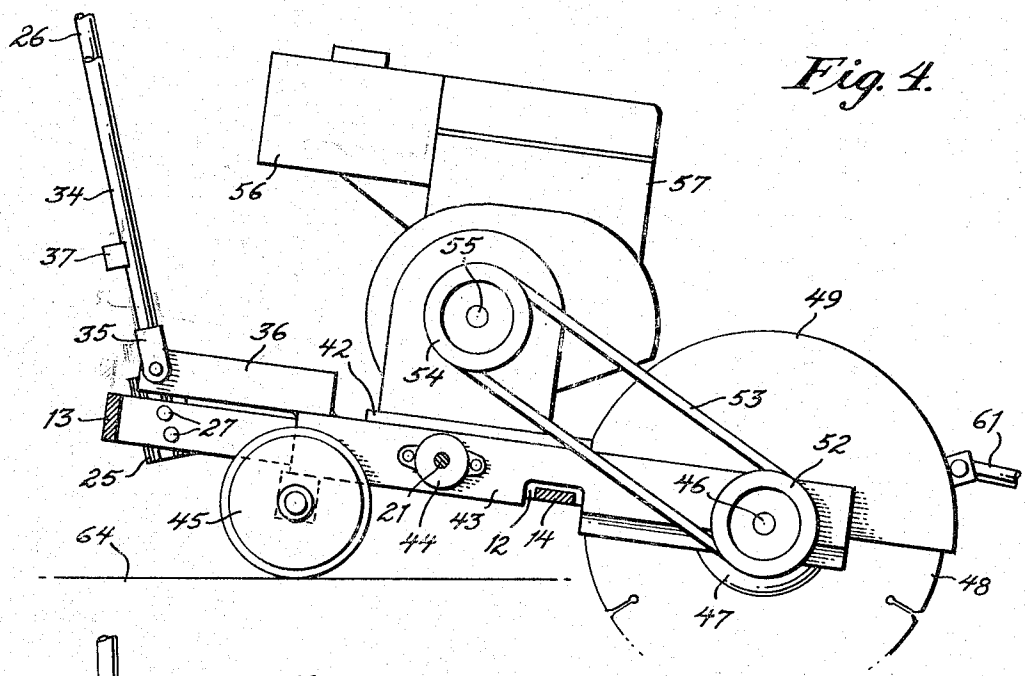


Fig. 4.

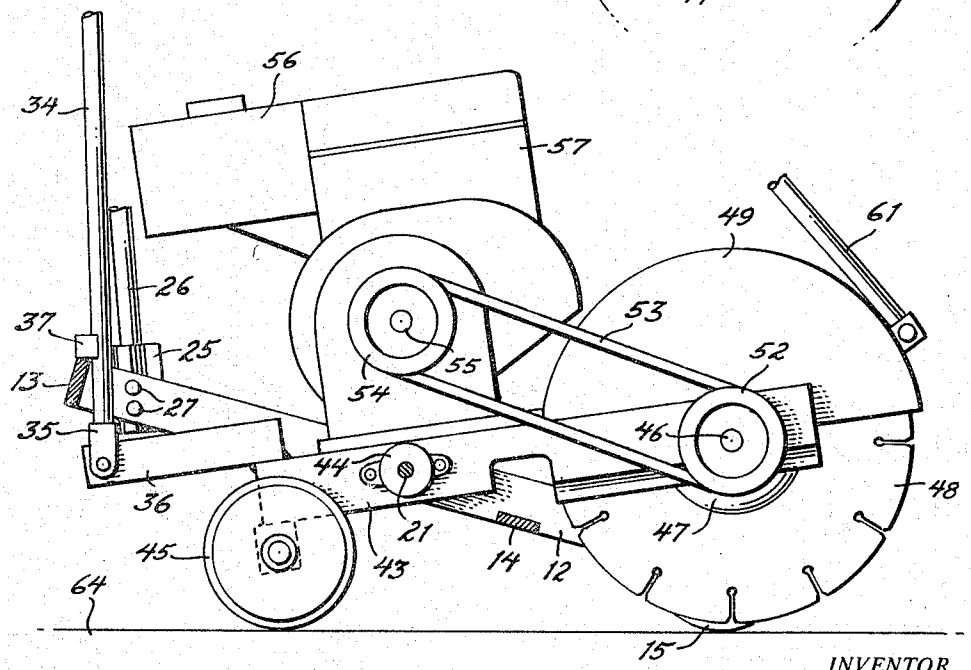


Fig. 5.

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United States Patent Office

3,301,601

Patented Jan. 31, 1967

3,301,601

VERTICALLY ADJUSTABLE WHEEL SUPPORTED CONCRETE SAW

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Filed Sept. 8, 1964, Ser. No. 394,673

8 Claims. (Cl. 299—39)

This invention relates to apparatus for sawing or otherwise working a groove into or in flooring or pavement such as may be made of concrete or other durable material.

It is customary to groove expanses of flooring or pavement of concrete or other durable material in order to provide a relief space for lateral expansion and contraction, such as may occur upon variation in temperature and usually to fill the resulting groove with expansible or flexible material to exclude dirt and moisture. The grooving is usually accomplished by means of a rotary saw blade, and a somewhat similar but non-cutting tool may be employed to aid in filling the resulting groove. Conventional apparatus that can do so is difficult to steer, especially along a curved groove such as at the center line of a road and usually is either bulky and complex in design or flimsy and undependable.

A primary object of the present invention is provision of a machine for working a groove in pavement or the like that is compact, dependable, and easy to steer.

Another object is provision of such a machine with improved supporting of the rotary tool for working the groove.

A further object is improved and simplified supporting of the machine itself on the pavement.

Other objects of this invention, together with means and methods for attaining the various objects, will be apparent from the following description and the accompanying diagrams of a preferred embodiment thereof.

FIG. 1 is a side elevation of a machine embodying the present invention, showing in solid lines a low position of the rotary tool, and indicating in broken lines a high position of the rotary tool, relative to the flooring or pavement on which the machine is resting.

FIG. 2 is a bottom plan of the machine of the preceding view, taken at II—II therein; and

FIG. 3 is a rear elevation of the same machine, taken at III—III in FIG. 1.

FIG. 4 is a side sectional elevation of the machine with the rotary tool at a low position, as shown in solid lines of FIG. 1, taken at IV—IV in FIG. 2;

FIG. 5 is a side sectional elevation of the machine with the rotary tool at a high position, as indicated in broken lines in FIG. 1; and

FIG. 6 is a top plan of a rear portion of the same machine, taken at VI—VI in FIG. 3.

In general, the objects of the present invention are accomplished, in a machine for working a groove in a pavement or the like, by means of a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe. The invention comprehends particularly such a machine wherein the rotary tool is located essentially midway between the pair of wheels on the frame, with the locus of the axis of rotation of the tool, as determined by pivoting of the subframe

with respect to the frame, intersecting the common axis of the pair of wheels on the frame.

As shown in the respective views, the machine has generally rectangular frame **11** defined by pair of side members **12**, rear transverse member **13**, and intermediate transverse member **14** located nearer the front end than the rear end. Pair of supporting wheels **15** are mounted outside and at opposite front corners of the frame on individual stub axles having a common axis. The wheels are parallel to, and are located equidistant from, the longitudinal bi-sector of the frame. Transverse pivot shaft **21** extends across the frame approximately midway between the front and rear ends thereof in journals **22** affixed to the opposite side members. Brackets **25** affixed to the outside of the rear corners of the frame support upstanding handle members **26** retained in place by bolts **27** through the brackets and frame members. The handle members are joined by transverse spacer **28** near their top ends, which terminate in grips **29** (one each). Handwheel **31** located between the handle grips and above the transverse spacer is retained rotatably in journal **32** located midway of the transverse spacer, and screw **33** affixed to the handwheel extends downward between the handle members and enters sleeve **34**, which is threaded internally to accommodate the screw and is retained at its lower end by clevis **35** attached pivotally (about a transverse axis) to extension **36** from the rear of subframe **41**. Stop **37** on the sleeve abuts rear transverse member **13** of the frame in the high position of the rotary tool, as shown in FIG. 5 (and in the alternate position in FIG. 1).

Subframe **41** is shorter and narrower than frame **11** and is defined by bed **42** and attached pair of side members **43**, which are affixed by clamps **44** to transverse pivot shaft **21** journalled on the frame. Wheels **45** on individual stub axles are mounted at the rear corners of the subframe just inside the frame. Hub **47** for rotary tool **48**, which has guard **49** about its top half or so, is affixed to one end of shaft **46** at the front edge of the subframe, which extends forward over intermediate transverse member **14** to between wheels **15** at the front of the frame. Shaft **46** is mounted rotatably in journal bearings **51** and has multiple-groove pulley **52** affixed on its opposite end. Belts **53** run about the pulley and about similar drive pulley **54** on motive shaft **55** driven by engine **57**, shown with fuel tank **56**, carried on bed **42** of the subframe above transverse pivot shaft **21**. Guide arm **61** is pivotally supported about a transverse axis on the front of guard **49** for the rotary tool and carries guide wheel **62** at its opposite end. When not in use the guide arm may be elevated to rest against the top of the guard, as shown in broken lines in FIG. 1, whereas when in use it is swung forward and down, as shown in solid lines in FIG. 1, to place the guide wheel on a line or (as in FIG. 1) in a groove (**63**) in the pavement (**64**).

As is readily apparent, the angle of pivot or tilt of subframe **41** relative to frame **11** (measurable with transverse pivot shaft **21** at the apex of the angle, for instance) is adjustably controlled by handwheel **31**. Yoke **65** extends downward through an opening in transverse spacer **28** and has compression spring **67** held by clip **66** at the far end about the body portion below the spacer. One arm of the yoke hooks over the rim of the handwheel and between spokes thereof, while the other arm is available near one of the handle grips **29**, conveniently at the righthand side. Lifting the yoke manually against the compression of the spring permits the handwheel to be rotated manually to increase or decrease the insertion of screw **33** within sleeve **34**, thereby varying the angle of pivot or tilt of the subframe relative to the frame and thereby raising or lowering the rotary tool. Of course,

the handwheel is rotated in such a direction as to lower the tool as a groove is being sawed or otherwise worked and then is rotated in the opposite direction to raise the tool free of the groove and the pavement itself before moving to a fresh location.

The locus of the axis of the rotary tool as the insertion thereof with respect to the pavement surface varies in an arc centered at the transverse pivot shaft and passing through the common axis of the pair of wheels at the front of the frame, the axis of the rotary tool coinciding with the wheel axis at a position of intermediate insertion. Such location of the tool essentially midway of the wheels is extremely beneficial to the steering and tracking of the machine. The guide wheel can be followed about a sweeping curve with little or no difficulty, and curves of relatively small radius can be followed accurately. The machine is stable and dependable in operation and relatively maintenance free.

Although a preferred embodiment has been described and illustrated, modifications may be made therein, as by adding or subdividing parts or by altering their size, shape, or location, or by substitution of equivalents, while retaining all or some of the benefits and advantages and without involving a departure from the inventive concept embodied therein and defined by the following claims.

The claimed invention:

1. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe.

2. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means and having intermediate the ends motive means for the rotary tool, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe.

3. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe and including an adjusting handwheel mounted on the upstanding portion of the frame and cooperating screw means attached to the handwheel and to the subframe, respectively.

4. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe and including a pair of handles spaced transversely from one another on the upstanding portion of the frame and an adjusting handwheel mounted therebetween.

5. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool having a guard about the upper portion thereof and being located essentially midway between the pair of wheels on the frame and having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe.

6. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located between the pair of wheels on the frame and having at the opposite end supporting wheel means, a guide arm pivoted in a plane of alignment with the tool and carried on the tool guard, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe.

7. In a machine for working a groove in a pavement or the like, a frame having a base with handle means upstanding at one end and a pair of supporting wheels spaced apart along a common axis at the other end and pivot means oriented transversely of the frame intermediate the ends, a subframe pivotally carried on the pivot means and having at one end a rotary tool located essentially midway between the pair of wheels on the frame, with the locus of the axis of rotation of the tool, as determined by pivoting of the subframe with respect to the frame, intersecting the common axis of the pair of wheels on the frame, the subframe having at the opposite end supporting wheel means, and adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe.

8. In a machine for working a groove in a pavement or the like, a frame having a generally rectangular base with a handle upstanding at each rear corner thereof and a supporting wheel at each front corner thereof and a transverse pivot shaft midway of the front and rear ends, a subframe pivotally carried on the shaft with a supporting wheel at each rear corner thereof and a rotary tool blade on the front edge thereof swingable, upon pivoting of the subframe relative to the frame, with its axis of rotation moving along an arc passing essentially midway of the supporting wheels on the front of the frame, and an adjustable linkage interconnecting the frame and the subframe to control the angle of pivot between the frame and the subframe and including an adjusting handwheel mounted on the upstanding portion of the frame and cooperating screw means attached to the handwheel and to the subframe, respectively.

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