United States Patent

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[54] **CULTIVATING TOOL MOUNTING ASSEMBLY**
5 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **172/710,** 172/713, 172/719
[51] **Int. Cl.** **A01b 35/06**
[50] **Field of Search** 172/264, 265, 269, 710, 713, 719

[56] **References Cited**

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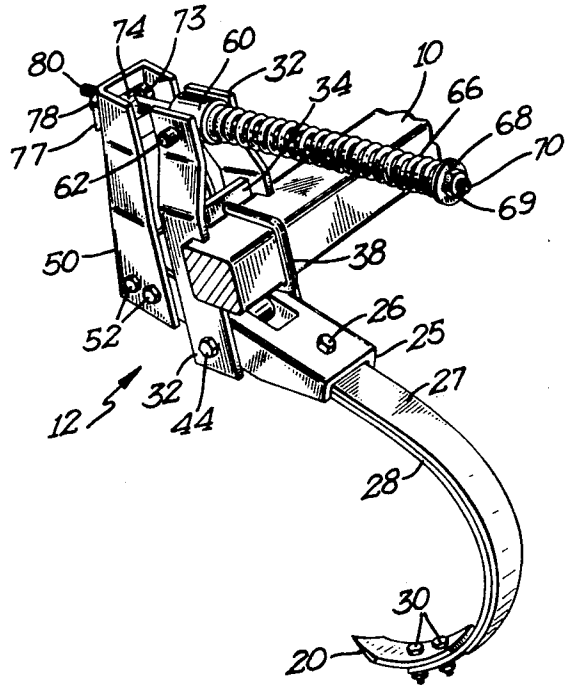
ABSTRACT: A cultivating tool mounting assembly in which a cultivating tool is mounted on a tool support, generally L-shaped in form, and pivotally mounted on a connecting frame member with a biasing spring connected between the connecting frame member and tool support to bias the tool support in movement relative with the connecting frame member. The biasing system includes a pressure rod which is slidably mounted in one end of the connecting frame member through a pivoting guide and is mounted on the tool support at an upstanding portion of the same through a rocking or pivoted connection to minimize wear on the biasing system and pressure rod.



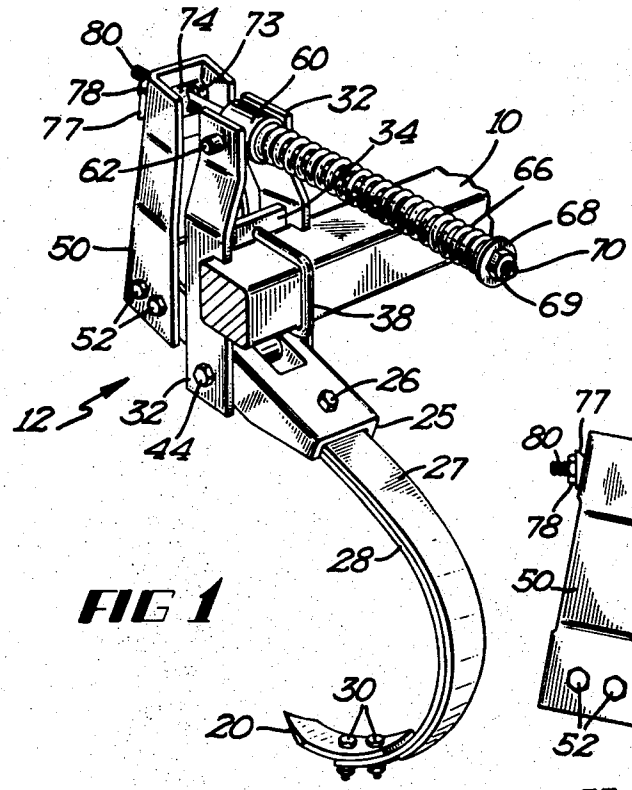


FIG 1

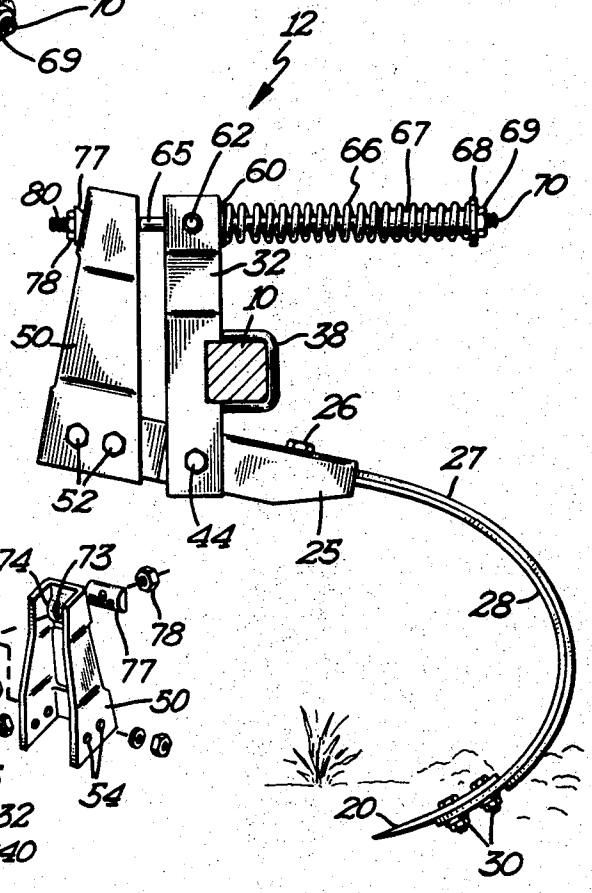


FIG 2

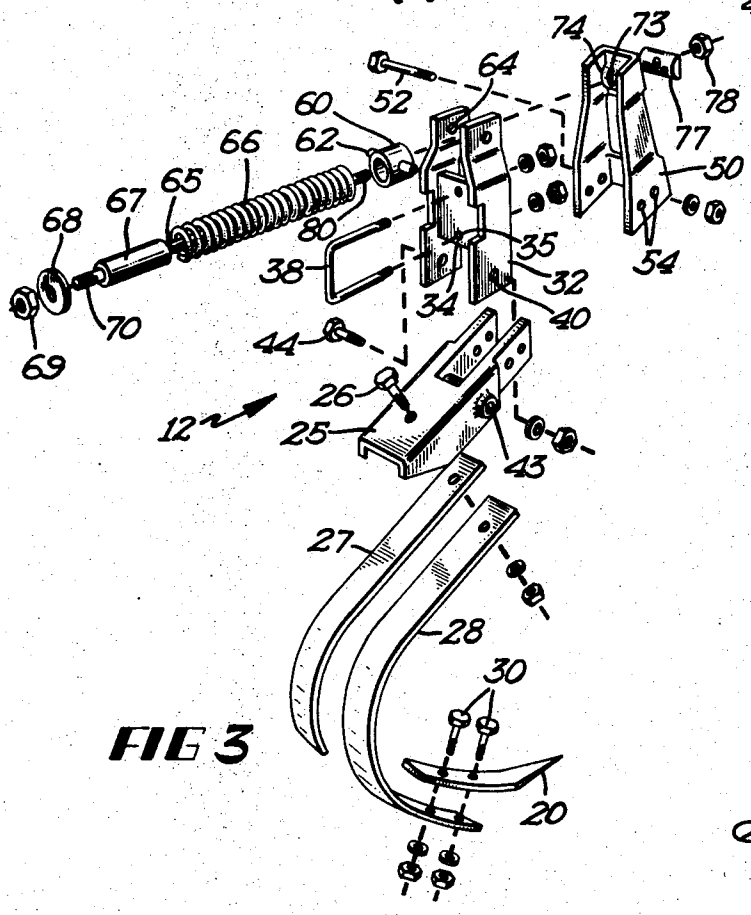


FIG 3

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CULTIVATING TOOL MOUNTING ASSEMBLY

This invention relates to mounting assembly for cultivating tools and more particularly to an improved cultivating tool mounting assembly.

Structures of this type are known and in use and have in the past taken varying forms. Generally, such structures provide an arrangement for pivotally mounting a cultivating tool on a frame part and biasing the same to a predetermined position with provision for displacement of the cultivating tool under conditions of obstruction or heavy soil during a cultivating process to permit displacement of the support relative to the earth being worked to prevent damage to the cultivating tool. Such structures are subject to wear and physical breakdown of the biasing springs because of unequal strains and twisting or bending movement applied to parts. The improved cultivating tool mounting assembly provides an arrangement in which the pressure rod, which transmits the bias force from the bias spring to the tool support mounting the cultivating tool in the pivoted position, will maintain the spring in a condition of alignment with the pressure rod and the pressure rod will apply only straight line force to the spring to minimize wear thereon. Further, the physical connection between the tool support and the pressure rod is pivoted to minimize breakage at this point. The location of the biasing spring is clear of the remaining portion of the structure to provide an overall simplified structure which has a long life and maintenance free operation.

Therefore, it is the principal object of this invention to provide an improved cultivating tool mounting assembly.

Another object of this invention is to provide in a cultivating tool mounting assembly a simplified design which minimizes wear on the same and is low in cost.

These and other objects of this invention will become apparent from a reading of the attached description together with the drawings wherein:

FIG. 1 is a perspective view of the improved cultivating tool mounting assembly,

FIG. 2 is a side elevation view of the improved cultivating tool mounting assembly with parts broken away, and

FIG. 3 is an exploded view of the improved cultivating tool mounting assembly.

The improved cultivating tool mounting assembly, as will be seen in FIGS. 1 and 2, is adapted to be mounted on and supported by an elongated support member or frame of a cultivator or plow, such as is indicated generally at 10. The frame or support 10 normally extends within a cultivating apparatus in alignment with the wheel axis thereof and a plurality of such supports or frames will be included on the cultivating apparatus to mount cultivating tools in a ganged relationship. In cultivating apparatus, such an arrangement of parts is conventional and the individual tool support frames are adapted to be pivoted relative to the overall apparatus for the purpose of lifting the tools between working and a transport position.

The individual cultivating tool mounting assembly is comprised of a connecting frame, indicated generally at 12, which is mounted on or connected to the support frame 10 of the cultivating apparatus and will carry a working tool or cultivating tool such as is indicated at 20. The tool 20 is actually mounted on a tool support 25 through suitable nut and bolt connecting means 26 and this structure may also include an auxiliary support leaf 27 and mounting leaf 28, the latter actually mounting the cultivating tool through suitable nuts and bolts indicated at 30. The connecting frame 12 is shown herein as a pair of spaced plates 32 connected together by a transversely extending plate or flange 34 through which is positioned a plurality of apertures 35 to mount a connecting U-bolt assembly 38 which encircles the support or frame 10 to mount the connecting frame member 12 thereon.

Tool support 25 is mounted on one extremity of the connecting frame member through apertures 40 in the side plates 32 and a trunion-type bushing 43 positioned through the tool support intermediate its extent. A suitable journaling or mounting bolt 44 extends through the apertures 40 and trunion 43 in the tool support to pivotally mount the tool support

on the connecting frame member. The tool support includes an upstanding portion or member 50 which is connected to the extremity of the tool support beyond the trunion 43 through suitable bolts 52 extending through apertures 54 in the upstanding portion 50 and the tool support. This will provide a generally L-shaped configuration for the tool support and these parts may be formed integral, if desired. The tool support portion 50 is generally of the same width and length dimension as the connecting frame member and is normally disposed adjacent the same and in contact with the same such as to provide a stop or limit position for the tool support in its pivotal movement relative to the frame member for one direction of motion. At the opposite extremity of the connecting frame member is positioned a guide 60, the guide being a slidable journal with projecting pins 62 which project through apertures 64 in the upper extremity of the connecting frame member to mount the guide 60 therein for pivotal movement thereon. The cultivating tool mounting assembly includes a pressure rod 65 and compression spring 66 encircling the same with a suitable tubular spring form member 67 positioned around the rod and within the extent of the coil spring to maintain the shape or form of the same. One end of the pressure rod includes a suitable support washer 68 against which one end of the spring 66 bears and it is secured on the rod 65 by a nut 69 which threads on a threaded extremity 70 of the pressure rod. The pressure rod 65 extends through and is slidably mounted in the guide member 60 against which the other extremity of the spring 66 bears. Rod 65 also extends through an aperture 73 in an indented or recessed portion 74 of the upstanding frame portion 50 of the tool support. This recess is concave in shape and normally mounts a convexly shaped flange part 77 with a suitable aperture therein through which the opposite extremity of the pressure rod extends to be secured thereon by a nut 78 threaded onto the threaded portion 80 of the pressure rod.

This arrangement of parts will insure that the tool support member will be biased in a clockwise direction, as viewed in FIGS. 1 and 2, and will permit pivotal movement against the compression bias of the spring 65 in a counterclockwise direction to permit the cultivating tool to move out of the earth being worked upon engaging heavy ground or obstructions which might damage the same. As the tool support 25 with the tool 20 thereon pivots relative to the connecting frame member against the bias of the spring, the guide member 60 will pivot in the extremity of the connecting frame member to take care of the angular placement between the connecting frame member and the tool support and the extremity of the pressure rod 80 positioned through the convexly shaped guide 77 will ride in the recess 73 to maintain alignment of parts and minimize wear on the pressure rod and spring. The spring is held in compression between the guide member 60 and washer 68 on the end of the pressure rod, and the spring will be compressed as the tool support pivots in a counterclockwise direction, as seen in FIGS. 1 and 2. Any side loading is eliminated with the guide member pivoting in the connecting frame member and the extremity of the pressure rod 80 pivoting on the upstanding frame portion such that an alignment of parts is maintained minimizing wear on the biasing system of the cultivating tool mounting assembly. This will insure a longer life for the cultivating tool and its mounting assembly, which is simple in design, is relatively low in manufacturing cost and is easy to adjust and use.

I claim:

1. A cultivating tool mounting assembly comprising, a tool support, a cultivating tool adapted to be mounted on a surface of the tool support, a connecting frame member including means for connecting the frame member to a transverse support of a cultivator, journal means included in part on one extremity of the connecting frame member and in part on the tool support for pivotally mounting the tool support on a connecting frame member, said tool support having an upstanding portion beyond said pivot substantially normal to the remaining portion of the tool support, a pressure rod, guide means

slidably mounting said pressure rod, means pivotally mounting the guide means in the extremity of the connecting frame member remote from the means pivotally mounting the tool support, spring means connected between an extremity of the pressure rod and said guide means for biasing said pressure rod in a predetermined direction, said upstanding portion of the tool support having a curved recess therein through which the opposite extremity of the pressure rod extends, and a curved connecting member positioned on the pressure rod and pivotally mounting the opposite extremity of the pressure rod to the upstanding portion of the tool support to permit rocking motion of the pressure rod relative to the upstanding portion of the tool support and the connecting frame member with relative movement between the tool support and the connecting frame member, said connecting member and the curved recess in the upstanding portion of the tool support having apertures therein through which the pressure rod extends and in which the curvature of the recess and the connecting member are symmetrical with the aperture in the recess being larger than the aperture in the connecting member to permit the rocking motion of the pressure rod relative to the upstanding portion of the tool support.

2. The cultivating tool mounting assembly of claim 1 in which the spring means connected between the extremity of the pressure rod and the guide means encircles the pressure rod and is a compression spring with the pressure rod having threaded extremities and including nut means threaded on the threaded extremities to retain the spring means on the pressure rod and the connecting member on the opposite extremity of the pressure rod.

3. The cultivating tool mounting assembly of claim 2 in which the upstanding portion of the tool support has substantially the same length and width dimension as the connecting frame member such that the upstanding portion will engage the surface of the connecting frame member to limit movement of the tool support in one direction.

4. The cultivating tool mounting assembly of claim 3 in which the curved recess in the upstanding portion of the tool support is concave and the curved connecting member attached to the other extremity of the pressure rod is a convex flange secured to the said extremity of the pressure rod through bolt means and resting in the concave recess in the upstanding frame member to rock thereon.

5. The cultivating tool mounting assembly of claim 1 in which the spring means encircles the pressure rod and is in compression to bias the upstanding portion of the tool support against the connecting frame member in a normal position and to permit pivotal movement of the tool support on the connecting frame member against the compression of the spring means as the pressure rod is drawn through the guide means and pivots on the upstanding portion of the tool support through its pivotal connection thereto with pivotal movement of the tool support and the cultivating tool thereon.