Title: Toolbar hinged clamp bracket

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A hinged front mounting clamp bracket is disclosed. The invention is typically used as a part of an agricultural mechanism such as a planter or an in-frame press wheel assembly. The invention comprises a rotatable hinged front mounting clamp bracket that allows a cultivator assembly draw bar to be located on a toolbar from above or below and then connected to that toolbar by a hinged clamp bracket, rotatable pivoting bolt assembly, locating lugs and fastening nut. The entire clamp design allows single operator attachment or detachment in the field and ease of positioning and adjustment of the assembly for maximum operational efficiency.
Invention Title:

"TOOLBAR HINGED CLAMP BRACKET"

The following statement is a full description of this invention, including the best method of performing it known to me/us:
TOOLBAR HINGED CLAMP BRACKET

In the agricultural environment, when planting seeds for large scale applications such as commercial farms, a cultivator apparatus may be towed behind a tractor or fixed to a tractor’s three-point linkage to create channels or furrows in the soil, which is followed by planting of a seed within the channel, which in turn is followed by a press wheel assembly to press down on the soil to cover the seed and firm down the soil to provide optimal soil conditions for germination. Usually, a plurality of cultivator units are attached to a toolbar that aligns the planter units and press wheels at selected distances apart from each other and that there are a number of toolbars mounted in parallel in a frame attachable to a tractor via a tow bar or three-point linkage.

To achieve best utility from the cultivator in large commercial applications, the maximum number of planter and press wheel assemblies are attached to the frame in total. Typically, when there is a plurality of assemblies, operational adjustments between each of the assemblies is not consistent because there is no form of calibration of these adjustments. This results in non-uniform seed planting and pressing and thus uneven and diminished germination.

It is, therefore, an object of the invention to be able to connect the cultivator assembly to a plurality of toolbars in a frame by a mechanism that is easy to utilize and allows greater flexibility in mounting and adjusting the position of each assembly when there are multiple assemblies mounted on each toolbar. These adjustments enable greater numbers of press wheels to be mounted per toolbar without increasing the likelihood of inter-assembly fouling and clashing either between assemblies on the same toolbar or between assemblies from one toolbar to another within a frame of toolbars.

The cultivator units are typically operated in large and often remote field situations where additional support is limited. Because there is operational benefit to attaching as many assemblies as possible to the toolbars and frames, the ability to have one operator easily and accurately attach these assemblies is important.
It is, therefore, a preferred object of the invention to be able to easily and accurately attach and detach these assemblies in the field by a single operator without the use of specialised tooling or large in-field support equipment.

The invention may be better understood with reference to the accompanying drawings, which show one example of the invention. The drawings depict the application from a holistic context. In order that the invention may be readily understood and put into practical effect, preferred embodiments are described by way of example with reference to accompanying drawings as stated.

Figure 1 shows a 3D view of a typical assembly that would include the hinged front mount clamp bracket. This view depicts the invention for clarity, without specifying preferred embodiments.

Figure 2 is a 3D view that shows a typical assembly attached to a truncated toolbar and positioned to follow a cultivator and planter on a separate toolbar. This is a holistic view that depicts the invention for clarity, without specifying preferred embodiments.

Figure 3 is two 3D sectional views and two sectional sideways elevation of the front mount hinged clamp bracket. The upper sideways elevation view demonstrates the two most typical sizes used for the invention, namely those designed to attach to a 100mm x 100mm or 75mm x 75mm toolbar. The upper 3D view demonstrates the hinged clamp bracket (1) in the closed position. The fixed bracket (2) has a fitting (3) that retains a pivoting bolt assembly (4) that engages within the hinged clamp bracket and is then locked into place to retain the entire bracket to the required toolbar by tightening of the attachment nut (5). The fixed bracket assembly also has toolbar locater lugs(6) that allow the hinged clamp assembly to rest upon the toolbar during mounting, locating and clamping operations. These lugs allow the single operator to rest the fixed bracket upon a toolbar whether the clamp assembly is upright or inverted during attachment or detachment operations. The third view shows the hinged clamp bracket (1) rotated to the open position away from the fixed bracket (2). In this view the engagement lug (7) that retains the pivoting bolt assembly (4) is more clearly demonstrated, and the rotation of the pivoting bolt assembly can be clearly seen.
Figure 4 demonstrates the hinged bracket assembly secured in its alternate and inverse position, which thus allows the operator to select their preferred attachment method.

Figure 5 has a sectional 3D view of the adjustable pivot block (8) which is attached at one end to the hinged front mount clamp bracket (2) and at the other to a trailing arm mechanism (9). The pivot block allows lateral movement about a vertical pivot (10) and vertical movement about a horizontal pivot point (11). The amount of lateral movement about the vertical pivot point is controlled by locating variously sized wedges (12) onto the hinged clamp bracket. These wedges restrict the lateral movement of the pivot block by varying amounts, the thicker the wedge, the greater the restriction and less lateral movement provided.

Figure 6 has three 3D views typical wedges (12) that are used in the adjustable pivot block to vary and control the lateral movement about its pivot point. Also shown is the bolt hole (13) that attaches the wedge to the adjustable pivot block.

Various changes and modifications may be made to the embodiments described and illustrated without departing from the present invention.
The claims defining the invention are as follows:

1. A hinged front mounting clamp bracket including: a fixed bracket, hinged clamp bracket, pivoting bolt assembly, locating lugs, fastening nut and rotatable attachment point for connection to a pivot block assembly.

2. The hinged front mounting clamp bracket of Claim 1, wherein: the clamp bracket can be specifically mounted to either a 100 mm x 100 mm or 75 mm x 75 mm toolbar or other specified size toolbar as required.

3. The hinged front mounting clamp bracket of Claim 1 or Claim 2, including: a fixed bracket and hinged clamp bracket, wherein the hinged clamp bracket can be closed with and engaged upon said fixed bracket.

4. The fixed bracket for the clamp bracket of any one of Claims 1 to 3, wherein: said fixed bracket has a retaining mechanism and a pivoting bolt assembly that releasably engages with and locates the hinged clamp bracket to retain the entire bracket and mechanism to the required toolbar, allowing the hinged front mount clamp to be affixed by a single operator while providing the stability and rigidity required in operational use; and said fixed bracket has toolbar locator lugs that allow the hinged clamp assembly to rest upon said toolbar during mounting, locating and clamping operations.

5. The hinged front mounting clamp bracket of any one of Claims 1 to 3, wherein: the body of the bracket contains locating lugs that allow attachment to a pivot block either upright or rotated to the inverse position, providing for the fixed bracket to rest upon a selected toolbar from above or drawn to the same toolbar from below during the process of being connected to said toolbar, enabling single operator affixing and positioning of the entire assembly.