LOAD CARRIER OF CLAMPING TYPE FOR TREES AND LOGS

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ABSTRACT

A clamping load carrier having two arms at respective ends of a supporting beam, said arms being swingable to embrace or relieve a bunch of tree trunks. The improvement consists in that a rope is fixed at the free end of each arm, and in that the supporting beam contains means for pulling the lower extensions of the ropes against the middle portion of the beam to safely clamp the trunks placed on the load carrier when the arms are folded.

1 Claims, 2 Drawing Figures
This invention relates to a load carrier of clamping type of the kind comprising lateral arms projecting upwardly from the ends of a support beam and at least one swinging arm hinged at each lateral arm.

Conventional constructions of clamping load carriers with single swinging arms included the disadvantage, that in the case of irregular bundles the logs tended to creep out of their hold. This problem could have been solved in principle by using articulated swinging arms. However, the number of links required for a satisfactory function would be too great for being realizable in practice. One way of achieving a greater safety in holding the wood bundle during its trail transport has been by using toothed holding members. These members, however, by their teeth engagement with the logs have caused difficulties at unloading when the wood is dropped by rearward slipping. The conventional clamping load carrier, moreover, by holding the wood bundle very rigidly in relation to the traction vehicle, gives rise to detrimental breaking forces during transport in hilly terrain.

The aforesaid disadvantages are eliminated by the clamping load carrier according to the invention which is characterized in that close to the outer end of at least one swinging arm a rope is attached which is adapted so to extend from a point on the support beam that upon the folding of the swinging arms the rope can be strained and thereby safely clamps the wood placed on the load carrier.

The invention is described in greater detail in the following with reference to the accompanying drawings in which FIGS. 1 and 2 show in a schematic way a front view and a side view, respectively, of a clamping load carrier according to the invention.

Referring to the drawing, I designates a structure supported on a sulky or another movable support, the transverse beam 2 together with the lateral arms 3 forming the load carrier 4 proper for receiving and fixing the ends of logs pushed onto said carrier whereas the logs are transported with their opposite end skidding on the ground.

The fixing is effected both in a conventional way by swinging arms 4 mounted at the respective ends of the lateral arms 3 and each operated by a hydraulic means 5, and by means of a rope arrangement characterizing this invention. In the embodiment shown, said rope arrangement comprises two identical ropes 6, one end of each of said ropes being secured at the outer end of the swinging arm 4 in question, from which the rope runs down to the transverse beam 2 and around a return sheave 8 pivotally mounted adjacent the lateral beam 7 of the structure. It is to be observed that the two ropes 6 intersect in the transverse beam. Owing to the fact that the swinging arms according to the Figures are designed so as to overlap when being folded together, a rope intersection is also obtained adjacent the upper mounting points of the ropes. Each rope 6 runs from the return sheave 8 in question along the lateral beam 7 of the structure all the way to and around a second return sheave 9 mounted at the end of the piston rod of a hydraulic means 10 the cylinder of which is secured in the lateral beam 7. That part of the rope 6 which returns from the return sheave 9 is fastened with its end in point 11 of the beam 7.

In the embodiment shown, the hydraulic means 5 is of the single acting and the hydraulic means 10 is of the double-acting type, both being connected for feeding in parallel via one single two-position control valve (not shown).

The aforesaid system operates as follows. When loading is to be carried out, the two hydraulic means 5 so are fed that the swinging arms 4 are swung upwards to the position indicated by dash-dotted lines. Hereby the hydraulic means 10 connected in parallel with the hydraulic means 5 are emptied, so that the piston rods of the means 10 are retracted and thereby the ropes 6 can be strained to their mounting points at the outer ends of the swinging arms 4. Thereafter the wood is placed on the load carrier 2, 3 and the hydraulic means 10 is fed on its pressure side whereby its piston rods are pushed out. This causes the ropes 6 to be strained and to press the swinging arms 4 against the loaded wood at the same time as the ropes are tightened around the load. The ropes 6, as appears from FIG. 1, form in principle a slinger having its holding points above and below the load. The fluid pressed out of the hydraulic means 5 upon the folding together of the swinging arms flows together with the return fluid of the hydraulic means 10 via the control valve (not shown) back to the vessel (not shown). Owing to the fact that the cylinders of the hydraulic means 5 and 10 are connected in series, the ropes 6 always are maintained strained to some extent, thereby effectively preventing a slacking of the ropes which otherwise may cause entangling or another disturbing effect on the operation.

It is understood that the aforesaid arrangement provides a holding of the wood bundle which is both flexible and safe, because the snare adjusts itself to the shape of the bundle irrespective of how said shape changes during the loading operation. Together with the utilization of the advantages of the snare with respect to elasticity also the advantages of the swinging arms with respect to the rapid opening of the clamping members (swinging arms and ropes) upwardly are utilized for supplementary loading or unloading. Owing to the position of the anchoring points of the ropes (snare) in loaded condition, the load is allowed to move freely in relation to the stationary rigid structure. Hereby it has also become possible to design the load carrier with a softly rounded upper surface, which in its turn substantially facilitates the unloading of the wood by sliding rearwardly off the load carrier to form a well-collected wood stack.

The invention is not restricted to the embodiment shown, but different modifications thereof within the scope of the invention are obvious to the expert, particularly as regards the arrangement for tightening the ropes. It is not necessary, either, that the ropes intersect, irrespective of whether the swinging arms are in their unfolded or folded position. In principle it is sufficient to provide only one rope which in that case must effect a one-side tightening of the wood against one side of the load carrier. However, the symmetric rope arrangement usually is to be preferred because of its greater flexibility.

What I claim is:

1. A load carrier of the clamping type, preferably for trees and logs, which comprises
   a structure adapted to be mounted on a movable vehicular support;
   a generally horizontal transverse beam for supporting such wood said transverse beam being carried on said structure;
   projections extending upwards from each end of the transverse beam and serving as respective points for two swingable arms;
   a first pair of hydraulic means, of the single-acting type, pivotally connected between said projections and said arms, for driving respective arms between an open and an overlapping position;
   a chain associated with each arm;
   a second pair of hydraulic means, of the double-acting type, for tightening the respective chains, said second pair of hydraulic means being positioned horizontally adjacent and below the upper level of said transverse beam;
   each chain having one of its ends fixed to the top of the associated swingable arm and its other end fixed to said beam at a locus adjacent the opposite swingable arm;
   each of said second pair of hydraulic means comprising a cylinder and piston with piston rod extending in a direction away from said transverse beam and being so located with respect to its associated chain that said piston rod when extended acts upon the chain to tighten the chain in a direction towards the middle portion of the beam whereby, after the two swingable arms are folded by operation of said first pair of hydraulic means for embracing a bunch of tree trunks laid on the beam, said second pair of hydraulic means are actuated to tighten
the chains resulting in a firm gripping of the bunch and pressing said bunch against the middle portion of the upper surface of the transverse beam.