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IMPROVED DESIGN OF TRACTOR HINGED

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An apparatus for connection nachipki wheeled tractor vehicle, get dependence of the elasticity of the position of the upper link .

Keywords: process, design, accessories, vehicle hinged equipment.

Introduction: The analysis of hinged improved design that provides lower overall energy costs. The subject of the study is to improve the rapid separation unit - z'yednannya tractor with agricultural implements .

Problem . The task of research is to use the concept of linear restoring force , which is related to the elastic force of the spring. The object of research is the rapid separation unit - connect the tractor with agricultural implements .

Analysis of recent research and publications. The scientific problem is solved by the review and analysis of patent literature. Known construction coupling hook attaching , mainly for the lower three-point linkage tractor mounted device [1], Figure 1.

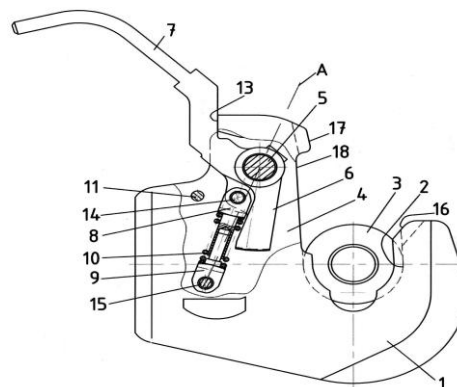


Fig.1. The design of the coupling hook attaching .

Quick hook mounted device comprises a housing 1 has two jaws for receiving and placing Towing , such as ball , supports 3 guns, the inner cavity 4, in which the hinge 5 is set latch 6 is made in one piece with the handle 7 (Figure 1). In the cavity 4 are also telescopic established between a top and bottom tabs 8 and 9 , between which they set coaxially compression spring 10 , and the top of the cavity 4, in the area of movement of the handle 7, vykochennya turn latch handle 6 of 7. The top hole 8 is set to latch 6 by a hinge 14 and the bottom hole 9 is installed at the bottom of the cavity 4 housing 1 by a hinge 15. Hinge 14 lugs 8 located on the latch 6 so that the closed position the coupling hook axis 10 springs located between A plane passing through the axis of the hinge 15 bottom eyelets 9 and 5 axis hinge bolts 6, maw and 2, and in the open position coupling hook axle springs 10 located between the plane A and the handle 7. To receive quick support and

fixing in the throat 3 and 2 on the body 1 hook made guides 16, 17 and bearing surface 18. Mayemo known coupling structure for connecting wheel tractor trailer [2] Figure 2.

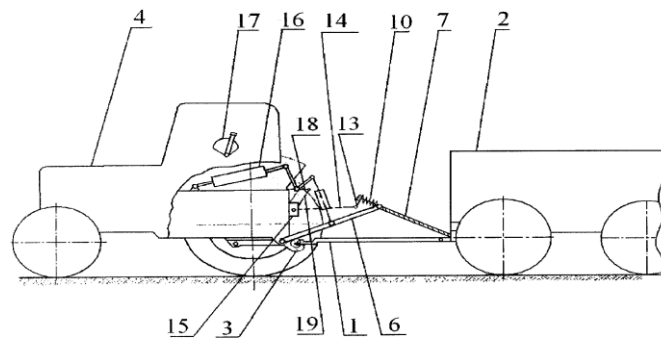
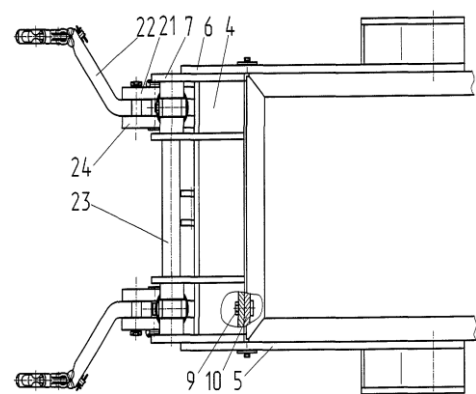
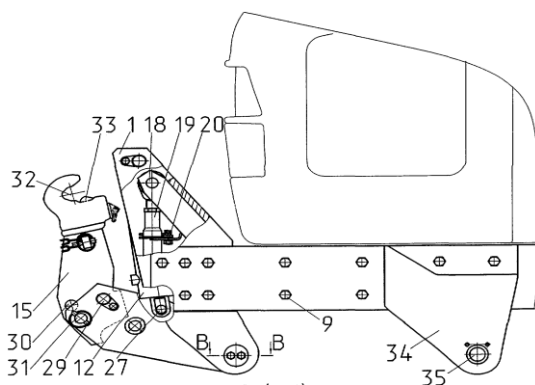


Fig.2. The design of the coupling device for connecting wheel tractor -trailer .

Quick coupler contains a hard power link connecting the trailer drawbar 1 of hydrokryukom 2 3 4 tractor and flexible power link connecting the crossbar 5 in the lower longitudinal rods 6 4 tractor hanging from the front axle of the trailer 2. Flexible power connection crossbar 5 of the front axle of the trailer 2 has a bearing washer 11 and fixed at 5 poperechtsi nut 12. The spring 10 via a link 13 and feedback 14 associated with the power regulator 15 which is connected to the hydraulic cylinder 16. Management control handle 15 has 17 settings. Crossbar 5 cinematically connected to a sensor 18 connected via feedback 19 with position regulator 15. Feedback 14 and 19 can be mechanical or electrical type , depending on the type of position- power regulator. The famous design of the device for mounting attachments to the vehicle [3] , Figure 3 . The proposed technical solution is explained by drawings , where Figure 1 shows a general view of the device side view ; on a - general view of the device, top view ; at least - shows additional frame, side view ; on a - an additional frame, front view ; on D - cut by AA NAA ; on e- gap is - depicted three-point gear control mechanism in working position, side view ; to with - cut -in on the same ; to with - type D in Figure 2 .



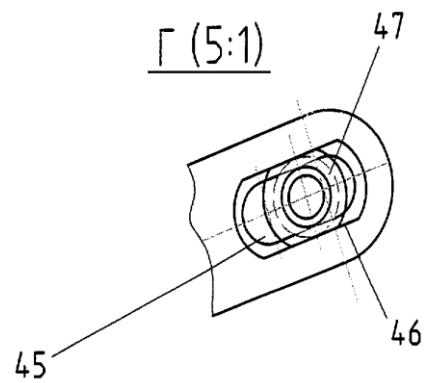
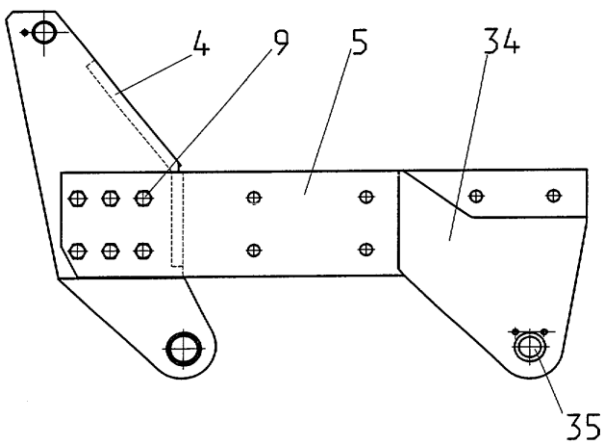
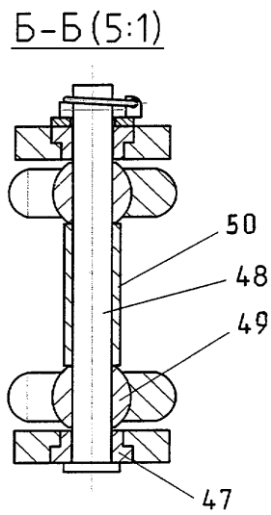
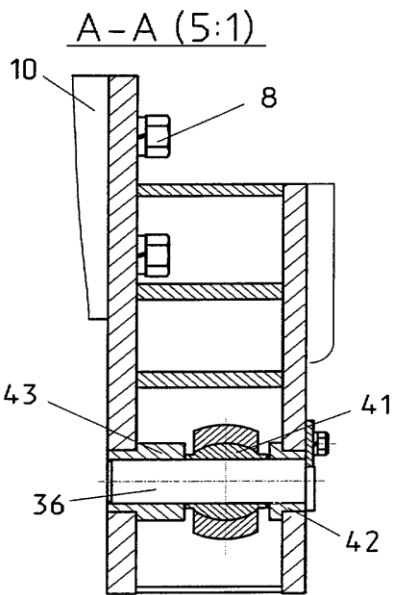
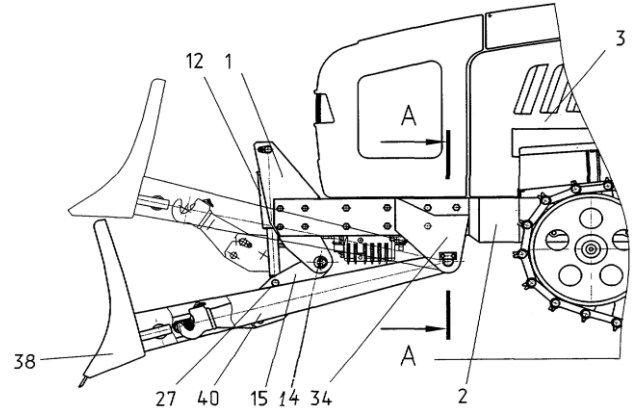
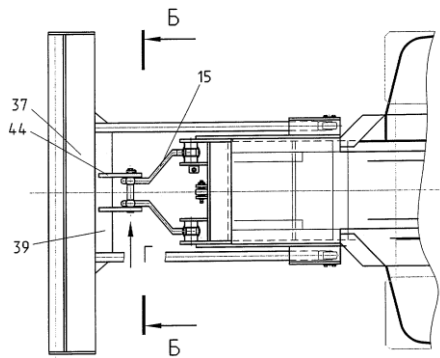


Fig. 3. Prystryi for mounting attachments to the vehicle.

Device for fastening attachments to the vehicle containing the device mounting additional attachments, made in the form of additional frame 1 (d) installed on the vehicle frame 2 3. Additional frame 1 is made of three parts: frontal and two lateral 4 5 and 6. The front part 4 is made of ribs 7 and 8 holes through which the bolts 9 fixed on the front wall 10 of the frame 2 (b), and the side parts 5 and 6 fixed bolts 9 frame spars March 2 tractors and on the sides of the extreme edges of the front 7 4. In front of the ribs 7 4 openings 11, which are fixed cylinders 12 and 13 holes for mounting the axles 14 via the lower linkage 15 three-point linkage mechanism working tools. In front of the ribs also made 16 of 17 holes, which is installed on the axis 18 (e) of the central thrust of 19 three-point linkage mechanism working tools and between the ribs on the central axis of the thrust spring retainer 19 made 20 central thrust mount 19 in working position. Lower link 15 three-point linkage working mechanism of mating parts 21 and 22 (b) installed with the possibility of swinging in the vertical plane under the action of hydraulic cylinders 12. The rear part 21 of the lower linkage 15 is made of two tightly connected by a pipe 23 parallel levers, each consisting of two cheeks 24 (b), which made coaxial holes of the sleeve 25 through which the axis of the lower link 14 connected to the additional frame. From the displacement axis 14 fixed enshrined therein washer 26. On the back of the hole 27 is also made for connecting hydraulic cylinders with holes 12 and 29 connect to the front of the thrust 22. On the back of lower rods 21 15 completed one hole 30, 22 on the front two holes through which through axis 31 carried fixation rods 15 in lower operating and non-operating positions. The front of the rods 22 has a Z-shaped in plan and ends plus 32 for installation of attachments and spring-loaded clamp 33. On the side parts 5 and 6 extra frame 1 made ears 34 with holes 35, in which the axis 36 is fixed with the ability to swing under 12 additional influence of hydraulic cylinders mounted equipment Bulldozer 37 (c). Bulldozer equipment is a rigid structure, sostoyaschuya additional attachment to the frame. For fixing rods 40 additional frames used ball joint 41 (g), mounted on an axis 36 between sleeves 42 and 43. transverse beam 39 are rigidly fixed two longitudinal cheeks 44 with longitudinal grooves 45 (c). The slots are made of 46 concentric guides that contain dried 47 with the axis 48 with the possibility of longitudinal movement along the guides 46. Axis 48 (e) is connected to the lower rods 15 three-point linkage mechanism working tools through ball joint 49 mounted on axle 48 between spacer sleeve 50 and crackers 47.

The purpose of research: The study is to develop advanced design system hinged tractors that provides rapid disconnection - connection of agricultural implements the tractor. To achieve this goal addressed in the following separate tasks: - quick installation of removable pins that have shaft with head and conical springs and even resistance;

- Development element mathematical model is the smallest diameter coil which is fixed in the ring groove posted on the part of his head, in addition, at the end of the spring rod fixed handle, and the second ring rod in secretly installed hinge latch.

Results. The construction of hinged systems do not provide operational reliability , so as not to take into account the linear restoring force. We were offered physical - mathematical model that describes the use of linear restoring force in the system hinged tractors accession to it of agricultural implements. Figure 4 . The scheme , to incorporate linear restoring force.

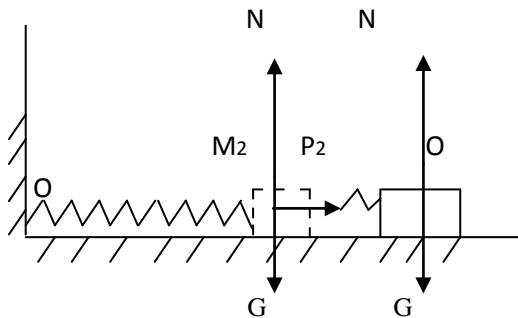


Fig. 4 . The scheme hinged system based on linear restoring force.

Weight of gun G , which is attached to the upper link hinge in working condition is not in a position O_h , on the one hand based not distorted in the spring, and the second bracket to the instrument. The other end of the spring rests on the finger flange. In this position, attached to the hinge hinged system tractor power: weight G and N are balanced reaction.

On the upper link hinge tractor in position M_1 will operate except N and G forces will act elastic stretched spring force P_1 , which aims to turn hinge to position O . Module rest of this force is proportional to this force:

$$P_1 = c \cdot OM_1 \quad (1)$$

In position M_2 compressed spring elastic force P_2

$$P_2 = c \cdot OM_2 \quad (2)$$

Also sent back hinge upper link to position O . Takym way deformed elastic force of the spring is always directed to the point O - position of rest hinge upper link and proportionally hinge deviation from this provision. Under the proposed physical - mathematical model corresponds to a patent [4], which in Figure 5 shows a diagram of the hinge on the upper link to create a linear restoring force.

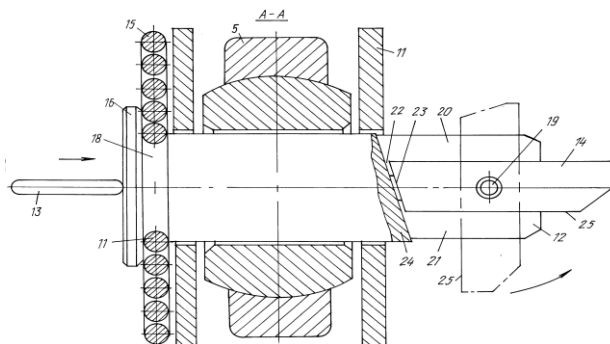


Fig. 5. Scheme of upper link pivot hinged system.

Conclusions: Through simulation process coupling for connecting wheel tractor - trailer the dependence of the elastic force of the position of the upper thrust.

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УСОВЕРШЕНИЕ КОНСТРУКЦИИ НАВЕСНОЙ СИСТЕМЫ ТРАКТОРА

Петров Л.М., Цобенко О.С.

Ключевые слова: технологический процесс, конструкция, приспособление, транспортное средство, навесное оборудование.

Резюме

Представлено приспособление для соединения навески колесного трактора с транспортным средством, получена зависимость, силы упругости от положения верхней тяги.

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Summary

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