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WO 2020/171785 (27.08.2020 Gazette 2020/35)(54) **A JAW ATTACHMENT HAVING VARIOUS FUNCTIONS****BACKENBEFESTIGUNG MIT VERSCHIEDENEN FUNKTIONEN****ACCESSOIRE DE MÂCHOIRE AYANT DIVERSES FONCTIONS**

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Description

Technical Field

[0001] Invention relates to earth moving machine attachments in construction sector.

[0002] The invention particularly relates to a jaw attachment having an end replaceable and rotatable end structure in both mechanics and hydraulic jaws used in bucket mechanisms of earth moving machines.

Background

[0003] Earth moving machine is one of heavy machines frequently used today. They are frequently used in construction of buildings as well as repair and collapsing works. The biggest example for the earth moving machine attachment is bucket. Buckets have an attachment called jaw connected to bucket to grab the excavated materials. Materials are grabbed and excavation or carrying process is performed by help of the attachments. Traditional mechanical jaws are mounted onto arm of machine and carrying of material is provided by means of moving of bucket. Also traditional hydraulic jaws are mounted to machine arm and materials are carried out by means of moving of both jaw and bucket. However, use of all those attachments only enables grabbing and displacement of materials. Although attachments, different work types can not be performed by use of them.

[0004] Since attachments used in the jaws do not have adjustment mechanism, attachments are to be dismantled for each operation and replaced for related operation. This process causes not only time loss but also probable accidents during operation.

[0005] When literature is searched regarding the matter, following applications are encountered.

[0006] Patent application numbered TR2017/08917 and entitled "Connection Mechanism Providing Practical Mounting/demounting Various Attachments to/from Earth moving machine" relates to a mechanism providing interconnection of various attachments of vehicles such as excavators/ loaders, buckets etc. That mechanism is characterized in offering an embodiment to provide practical assemble/disassemble attachments of earth moving machines. However, said application does not solve labor and time loss during assembly/disassembly and does not reduce accident risk during replacement as necessity to remove attachments completely from the machine.

[0007] Also invention numbered EP1896664B1 "Excavator Demolition Attachment With Interchangeable Jaw Assemblies" relates to an apparatus for attachment providing complete detachment of a jaw group without detachment of main joint pin of vehicles such as excavator, loader and bucket from jaw group. However, although it provides easy removal and installation of attachment from/to jaw group, it is obvious that labor and time loss will be seen because of necessity for complete removal from the machine. Prior art document US 7 617 619 B2

discloses a bucket with jaws.

[0008] As a result, the because of existence the said problems mentioned above and failure to provide solutions, it has been necessary to make a development in the related area.

Brief Description of the Invention

[0009] The present invention relates to a jaw attachment having various functions meeting the needs mentioned above, eliminating all disadvantages and providing some additional advantages.

[0010] Primary purpose of the invention is to provide an attachment embodiment having both jaw junction and ripper function thanks to its rotating and moving lower body.

[0011] Another purpose of the invention is to provide a jaw attachment not causing labor and time loss for operator and reducing work accident risk thanks to 180-degree rotation of fixed upper body and moving lower body around a central fixed connection axis without detachment from each other and fixing to perform jaw or ripper function.

[0012] A further purpose of the invention is to offer an economically advantageous jaw attachment by performing of both jaw and ripper functions by means of one attachment embodiment.

[0013] A similar purpose of the invention is to shorten total operation time needed for excavation and collection and thus reduce operation costs thanks to its performance of both jaw and ripper functions by one attachment embodiment.

[0014] A further purpose of the invention is to offer an economic attachment embodiment thanks to realization of renewal of tip part getting worn because of contacting excavation materials, by replacement of only lower body (20).

[0015] Another purpose of the invention is to provide a multi-function attachment embodiment to be provided with desired functions by means of various designs of moving lower body thanks to separate production of fixed upper body and moving lower body.

[0016] In order to achieve purposes mentioned above, the invention is a jaw attachment containing a fixed upper body moving by help of a mechanic or hydraulic cylinder that can be connected to bucket in earth moving machines, comprising bucket connection housings thereon for connection to said ripper bucket by means of connection members, and cylinder connection housings formed on rear surface for connection to said cylinder connection members, moving by means of driving force from said cylinder and providing grabbing and releasing excavation materials characterized in comprising at least a central connection housing formed on upper surface for connection to at least a central connection housing formed on lower surface of said upper body by means of at least a connection member, upper connection housings capable to rotate 180 degrees around central connection axis and

formed on upper surface by connection members after rotation movement, moving lower body fixed by lower surface connection holes formed on lower surface of fixed upper body, performing jaw function for collection of excavation material when fixed in direction by help of a pin contained on lower surface and performing ripper function for excavating excavation materials when fixed in direction.

[0017] In a preferred embodiment of the invention, said connection member is preferably a bolt of DIN912, M8x45 class.

[0018] The structural and characteristic features and working principle and advantages provided by the invention will be understood better in the figures given below and the detailed description by reference to the figures. Therefore, the assessment should be made based on the figures and taking into account the detailed description.

Brief Description of the Figures

[0019]

Figure 1a is a general view showing mounting of invention with jaw function to earth moving machine. Figure 1b is a general view showing mounting of invention with ripper function to earth moving machine. Figure 2a is a perspective view showing demounting of and mounting of invention with jaw function to earth moving machine. Figure 2b is a perspective view showing demounting of and mounting of invention with ripper function to earth moving machine. Figure 3 is a schematic view showing action of fixing invention by rotating moving lower body of invention. Figure 4 is a front detailed view of fixed upper body and moving lower body mounting of invention.

[0020] The drawings are not necessarily to be scaled and the details not necessary for understanding the present invention might have been neglected. In addition, the components which are equivalent to great extent at least or have equivalent functions at least have been assigned the same number.

Reference Numbers

[0021]

1. Jaw Attachment
- 10 Upper Body
- 101 Bucket Connection Housing
- 102 Cylinder Connection Housing
- 103 Central Connection Housing
- 104- Connection Hole
- 20 Lower Body
- 201 Central Connection Housing
- 202- Connection Hole

203 Pin

2. Bucket
3. Cylinder
4. Connection Member
- A. (+x) Horizontal Axis
- B. (-x) Horizontal Axis
- Y. Central Connection Axis (Vertical Axis)

15 Detailed Description

[0022] The present invention relates to a jaw attachment (1) having various functions meeting the needs mentioned above, eliminating all disadvantages and providing some additional advantages.

[0023] Invention is a jaw attachment (1) to be used in loader/excavator, basically comprising a fixed upper body (10) in main structure and a moving lower body (20) in rotating end structure. As shown in figures 1a and 1b, preferred embodiment of jaw attachment (1) of the invention is in status mounted to bucket (2) and a hydraulic cylinder (3). Jaw attachment (1) moves back and forth with the driving taken from said hydraulic cylinder (3). Grabbing and releasing excavation material is provided by means of movement of bucket (2) in the embodiment with jaw function as shown in figure 1a. Digging of excavation material is provided by means of back-forth movement (2) of the embodiment with ripper function shown in figure 1b.

[0024] Figure 2a shows perspective view of jaw attachment (1) with jaw function in the status when mounted onto earth moving machine. Bucket mounting housings (101) are formed thereon for mounting said fixed upper body (10) to bucket (2) by use of connection members. In a preferred embodiment, said fixed upper body (10) comprises two horizontal profiles connected between two profiles vertically opposite each. Inner surface of vertical profiles is preferably of tooth structure to enhance capability to grab inner surface. Upper body (10) resistance is enhanced by means of two profiles connected side by side vertically between said two horizontal profiles, and rear surface is formed. As shown in figure 3, cylinder connection housings are formed to provide mounting of jaw attachment (1) on rear surface of upper body (10) to hydraulic or mechanical cylinder (3) by use of connection members (102). For mounting said fixed upper body (10) to moving lower body (20) in rotating manner, central connection housing (103) is formed on horizontal profile forming lower surface of upper body (10). In addition, more than one connection hole (104) is provided on same profile in order to provide fixing moving lower body (20) to upper body after rotation by means of connection members.

[0025] In a preferred embodiment, said moving lower body (20) is formed by means of fixing vertical three profiles located at intervals to horizontal three profiles located one under another. Inner surface of vertical profiles is preferably of tooth structure to enhance capability to grab inner surface. End part of said vertical profiles comprises tooth (203) in order to perform grabbing or digging operation. Horizontal profile combining said profiles at the top forms upper surface of the lower body (20). For mounting said lower body (20) to upper body (10) in rotating manner, central connection housing (201) is formed on horizontal profile forming upper surface of lower body (20) (Figure 3). In addition, more than one connection hole (202) is provided on same profile in order to provide fixing moving lower body (20) to upper body after rotation by means of connection members.

[0026] In the jaw attachment (1) of the invention fixed upper body (10) and moving lower body (20) are interconnected in a manner enabling rotation at 180 degrees around central connection axis (Y) by a connection member (4) inserted into said central connection housings (103, 201). Connection member (4) can be a screw, bolt, nut, stop pin, pin, bushing, joint. The connection member (4) preferred here is bolt and of DIN912, M8x45 class. By help of this bolt, lower body (20) forming end section can rotate without complete detachment from upper body (10).

[0027] Moving lower body (20) is rotated in direction A and is fixed by connection members (4) inserted to upper body (10) through connection holes (104, 202) in order to enable jaw attachment (1) to perform jaw function. Detailed view of mounting is shown in Figure 4. The connection member (4) preferred here is bolt and of DIN912, M8x45 class. It can rotate without complete detachment from lower body (20) and upper body (10).

[0028] Moving lower body (20) is rotated in direction B and is fixed by connection members (4) inserted to upper body (10) through connection holes (104, 202) in order to enable jaw attachment (1) to perform ripper function. The connection member (4) preferred here is bolt and of DIN912, M8x45 class.

[0029] When said bolts are removed, lower body (20) which is approximately 20 kg is not detached from upper body (10) completely thanks to central connection. Thus there is no load to operator when changing function of attachment. Operator only rotates 180° after removal of bolts and mounts bolts again. Both jaw and ripper function is provided without labor and time loss.

[0030] Instead of jaw attachments produced as one part in related art, it is produced in two parts, namely, upper body (10) and lower body (20). While in related art it is needed to replace entire attachment to replace tips worn due to hard contact with excavation material, the invention provides economic value gaining as only lower body is replaced (20) and lower body (20) can be used for two functions. As the embodiment of the invention is produced in two parts, in alternative embodiments, lower body (20) can be designed and produced in a manner to

have desired functions. Thus, jaw attachment (1) of the invention can be provided with various functional characteristics.

Claims

1. A jaw attachment (1) containing a fixed upper body (10) moving by help of a mechanic or hydraulic cylinder (3) that can be connected to bucket (2) in earth moving machine, comprising bucket connection housings (101) thereon for connection to said ripper bucket (2) by means of connection members (4), and cylinder connection housings (102) formed on rear surface for connection to said cylinder (3) by connection members (4), moving by means of driving force from said cylinder (3) **characterized in that;** providing grabbing and releasing excavation materials and **characterized in** comprising at least a central connection housing (201) formed on upper surface for connection to at least a central connection housing (103) formed on lower surface of said upper body (10) by at least one connection member (4); a moving lower body (20) capable to rotate 180 degrees around central connection axis (Y), after rotation movement, fixed by lower surface connection holes (104) formed on lower surface of upper surface connection housings (202) fixed upper body (10) formed on upper surface by connection members (4), performing jaw function for collection of excavation material when fixed in direction (A) by help of a pin (203) contained on lower surface and performing ripper function for excavating excavation materials when fixed in direction (B).
2. The jaw attachment (1) according to claim 1 **characterized in that;** said connection member (4) is bolt preferably DIN912, M8x45 class.

Patentansprüche

1. Backenaufsatz (1), der einen feststehenden oberen Körper (10) enthält, der sich mit Hilfe eines mechanischen oder hydraulischen Zylinders (3) bewegt und der mit einem Löffel (2) in einer Erdbewegungsmaschine verbunden werden kann, umfassend Löffelverbindungsgehäuse (101) daran zur Verbindung mit dem Reißlöffel (2) mittels Verbindungselementen (4) und Zylinderverbindungsgehäuse (102), die auf einer hinteren Oberfläche zum Verbinden mit dem Zylinder (3) durch Verbindungselemente (4) ausgebildet sind, und der sich mittels der Antriebskraft von dem Zylinder (3) bewegt, **dadurch gekennzeichnet, dass;** er Greifen und Freigeben von Aushubmaterialien bereitstellt, und **dadurch gekennzeichnet, dass** er mindestens ein zentrales Verbindungsgehäuse

(201) umfasst, das auf der oberen Oberfläche zur Verbindung mit mindestens einem zentralen Verbindungsgehäuse (103) ausgebildet ist, das auf der unteren Oberfläche des oberen Körpers (10) durch mindestens ein Verbindungselement (4) ausgebildet ist; einen sich bewegenden unteren Körper (20), der in der Lage ist, sich um 180 Grad um die zentrale Verbindungsachse (Y) zu drehen und nach der Drehbewegung durch Verbindungslöcher (104) der unteren Oberfläche, die auf der unteren Oberfläche der Verbindungsgehäuse (202) der oberen Oberfläche ausgebildet sind, befestigt wird, wobei der feststehende obere Körper (10), der auf der oberen Fläche durch Verbindungselemente (4) ausgebildet ist, eine Backenfunktion zum Sammeln von Aushubmaterial ausübt, wenn er in Richtung (A) mit Hilfe eines Stifts (203) befestigt ist, der auf der unteren Fläche enthalten ist, und eine Reißfunktion zum Ausheben von Aushubmaterialien ausüben, wenn er darin in Richtung (B) befestigt ist.

2. Backenaufsatz (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verbindungselement (4) ein Bolzen, vorzugsweise DIN912, Klasse M8x45, ist.

d'une broche (203) contenue sur la surface inférieure et remplissant la fonction de défonceuse pour l'excavation des matériaux d'excavation lorsqu'il est fixé dans une direction (B).

2. Accessoire de mâchoire (1) selon la revendication 1, **caractérisée en ce que** ledit élément de raccord (4) est un boulon de préférence DIN912, classe M8x45.

Revendications

1. Accessoire à mâchoires (1) contenant un corps supérieur fixe (10) se déplaçant à l'aide d'un vérin mécanique ou hydraulique (3) qui peut être raccordé au godet (2) d'un engin de terrassement, comprenant des logements de raccord au godet (101) sur celui-ci pour un raccordement audit godet défonceur (2) au moyen d'éléments de raccord (4), et des logements de raccord au vérin (102) formés sur la surface arrière pour un raccordement audit vérin (3) par des éléments de raccord (4), se déplaçant au moyen d'une force d'entraînement en provenance du vérin (3) **caractérisé en que** ;
la fourniture de la saisie et du relâchement des matériaux d'excavation de saisie et de libération et caractérisé en comprenant au moins un logement de raccord central (201) formé sur la surface supérieure pour un raccordement à au moins un logement de raccord central (103) formé sur la surface inférieure dudit corps supérieur (10) par au moins un élément de raccord (4) ; un corps inférieur mobile (20) capable de tourner de 180 degrés autour de l'axe de raccord central (Y), après un mouvement de rotation, fixé par des trous de raccord de surface inférieure (104) formés sur la surface inférieure de logements de raccord de surface supérieure (202) fixé au corps supérieur fixe (10) formés sur la surface supérieure par des éléments de raccord (4), remplissant la fonction de mâchoire pour la collecte des matériaux d'excavation lorsqu'il est fixé dans la direction (A) à l'aide

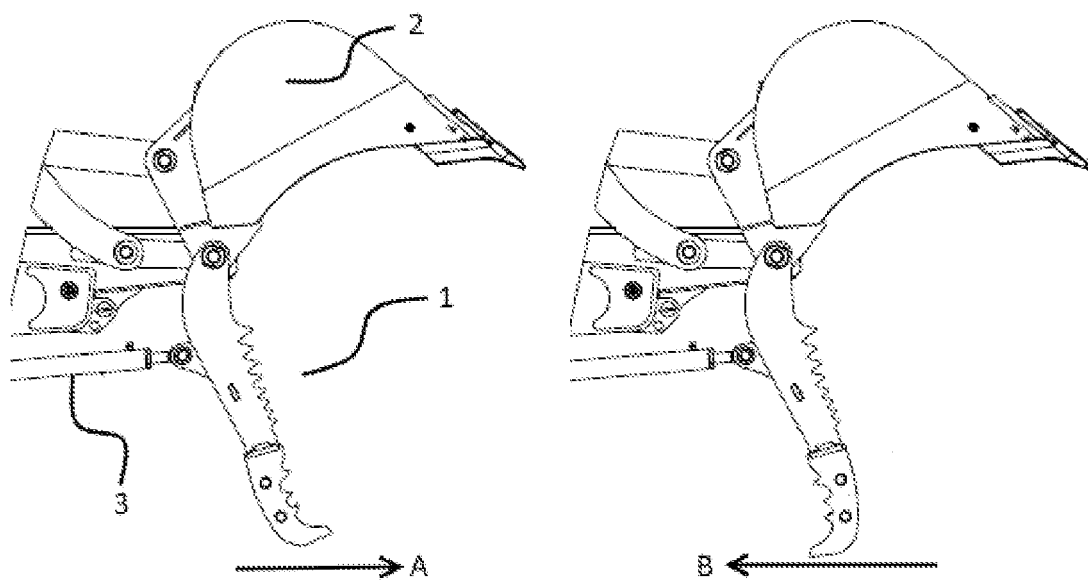


Figure 1

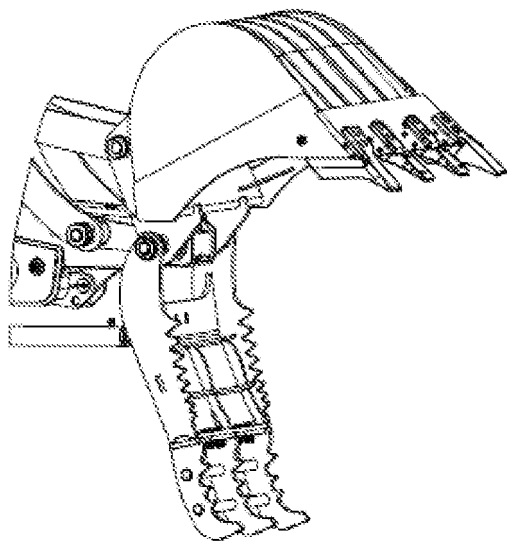


Figure 2a

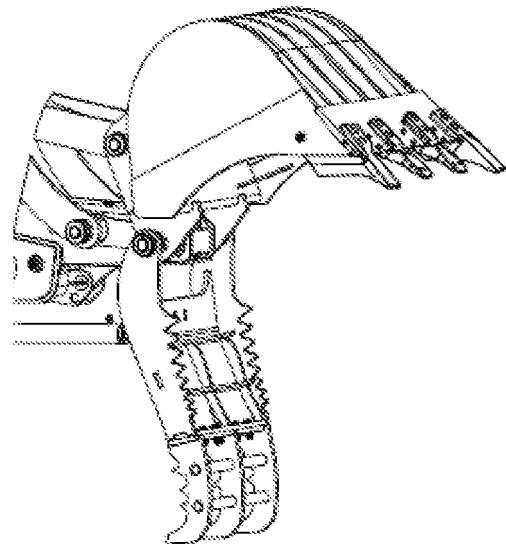


Figure 2b

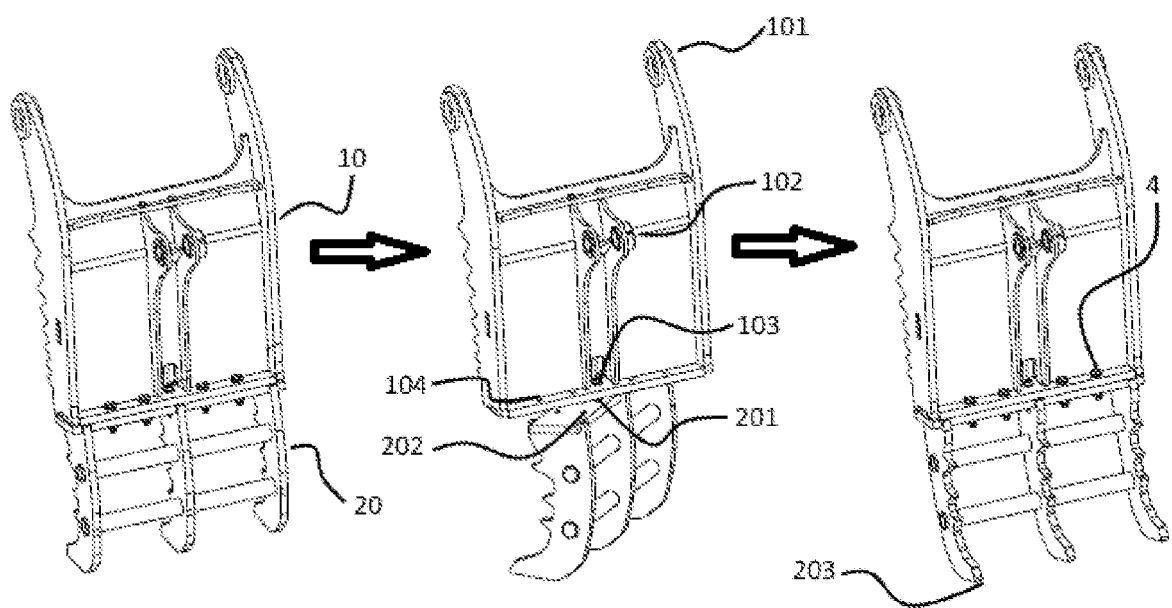


Figure 3

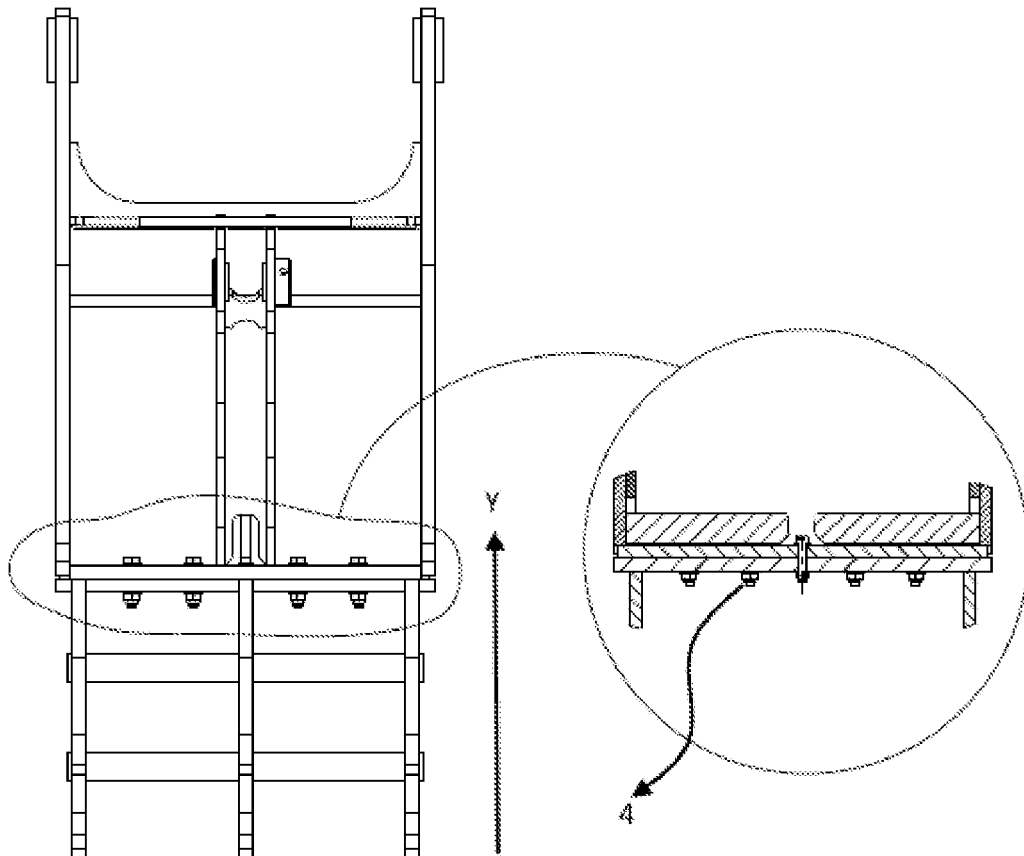


Figure 4

REFERENCES CITED IN THE DESCRIPTION

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