

(19)



(11)

EP 4 187 016 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

07.05.2025 Bulletin 2025/19

(51) International Patent Classification (IPC):

E01H 4/00 (2006.01)

(52) Cooperative Patent Classification (CPC):

E01H 4/02; E01H 4/023

(21) Application number: **22000252.1**

(22) Date of filing: **22.11.2022**

(54) **MOTOR VEHICLE WITH A DEVICE FOR LEVELLING SLED RUNS**

KRAFTFAHRZEUG MIT EINER VORRICHTUNG ZUM NIVELLIEREN VON SCHLITTENBAHNEN

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(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**

(30) Priority: **30.11.2021 PL 43971621**

(43) Date of publication of application:

31.05.2023 Bulletin 2023/22

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Description

[0001] The subject-matter of the invention concerns a motor vehicle, and in particular a tractor, with a device for levelling sled runs.

[0002] A tractor with a device which contains a screw conveyor to move accumulated snow towards a longitudinal transport chute was disclosed in CN111472314. To that end, it features an opening at one end of the device through which snow accumulated by the screw conveyor is discharged and at the same time fed into the transport chute. Then the snow is moved along the aforementioned transport chute to a second screw conveyor which moves the accumulated snow to the side. The screw conveyors and the transport chute are powered by the tractor's powertrain.

[0003] However, the disclosed invention does not groom the sledding surface by filling and levelling ruts made by the passage of numerous sleds. The indicated problem was solved by a motor vehicle with a device according to claim 1.

[0004] Document JP 2007 291842 A describes a consist made of a motor vehicle and a track levelling device, wherein snow collected in a predetermined place is accumulated in a hopper and then sent to a compacting apparatus and to a snow surface shaping apparatus in the form of a screw conveyor for finishing.

[0005] The essence of the invention comprises a motor vehicle comprising a chassis with a truss attached to it with a device for levelling sled runs. Chassis arms feature brackets for the main beam of the truss. The device also features an actuator connecting the main beam of the truss with its functional part, so that when turning, the functional part tilts relative to the main beam to a position where it is practically at a right angle to the sled run sides and once the vehicle completes the turn it returns to its starting position. The truss comprising at least two symmetrically mounted screw conveyors shielded from the side of the motor vehicle by an open chute. The shaft of each screw conveyor has two ends: internal and external. The internal end is connected to the motor vehicle drivetrain whereas the external end is attached in a floating manner within the truss. The motor vehicle drivetrain comprises the vehicle's drive shaft connected to a telescopic universal joint shaft, bevel gear, and a gear system which holds the internal shaft ends of both screw conveyors. A significant property of the invention is that the screw conveyors move accumulated snow towards the internal ends of their shafts, then the snow is compacted by a compacting plate mounted to the chassis of the vehicle behind the open chute of the device.

[0006] The external ends of each screw conveyor shaft in one embodiment are held in bearings, whilst another embodiment has them in a side bevel gear powered by a screw conveyor shaft. The side bevel gear transmits power to a side shaft of a side snow scoop, used to pile snow on the sides of the sled run for example. The side scoop comprises a belt conveyor, with its side shaft held

in bearings mounted to the device truss. The side shaft sets in motion a belt conveyor chain which has combs arranged along its length scooping and transporting snow from the bottom towards the top. A significant property of the invention is that the screw conveyors move accumulated snow towards the internal ends of their shafts, then the snow is compacted by a compacting plate mounted to the chassis of the vehicle behind the open chute of the device.

[0007] The snow moved by the screw conveyors and compacted by the compacting plate fills ruts in the sled run establishing a hard, ready to use sled run surface.

[0008] The illustration depicts the invention, with given figures showing the following:

Fig. 1 top view of the motor vehicle with device as per the invention,

Fig. 2 front view of the motor vehicle with device as per the invention,

Fig. 3 spatial view of the motor vehicle with device as per the invention,

Fig. 4 sled run levelling device mounted on a motor vehicle,

Fig. 5 front view of the sled run levelling device,

Fig. 6 bottom view of the sled run levelling device side snow scoop.

[0009] Motor vehicle 1 comprising a device for levelling sled runs. The device comprises a truss attached to chassis 2 of the motor vehicle. To that end chassis 2 has brackets 21 for main beam 3 of the truss. The truss performs a swinging motion relative to chassis 2 of the vehicle using actuator 4 connecting main beam 3 of the truss with its functional part 5. The truss features at least two symmetrically mounted screw conveyors 6 shielded from the side of the motor vehicle by open chute 7. The shaft of each screw conveyor 6 has two ends: internal end 61 and external end 62. Internal end 61 is connected to the drivetrain which comprises gear system 81, bevel gear 82, telescopic universal joint shaft 83 and vehicle drive shaft 84. Conveyor shaft internal ends 61 are held directly in gear system 81 connected to other drivetrain elements. External ends 62 of each screw conveyor shaft are held in side bevel gear 9 powered by screw conveyor 6 shaft. Screw conveyors 6 move accumulated snow towards internal ends 61 of their shafts, then the snow is compacted by compacting plate 10 mounted to chassis 2 of the vehicle behind open chute 7. The device also features snow scoop 11. Aforementioned side bevel gear 9 transmits power to side shaft 12 of side snow scoop 11. Side shaft 12 of side snow scoop 11 is held in bearings 13 attached to the device truss. Side shaft 12 sets in motion chain 14 of the snow scoop which has combs 15 arranged

along its length scooping and transporting snow from the bottom towards the top.

Claims

1. Motor vehicle (1) with a device for levelling sled runs, said motor vehicle comprising a drivetrain (81, 82, 83, 84), said device comprising a truss (5) attached to a chassis (2) of the motor vehicle (1), at least two screw conveyors (6) attached to the device truss, and shielded from the side of the motor vehicle by an open chute (7), wherein each screw conveyor (6) comprises a shaft having an internal end (61) connected to the drivetrain and an external end (62) attached to the truss, wherein each screw conveyor (6) is arranged to perform a rotation around its axis of rotation so that the accumulated snow is moved towards internal end (61) of screw conveyors (6), and wherein a compacting plate (10) is attached to the motor vehicle (1) chassis (2) behind the open chute (7) from the side of the motor vehicle (1), wherein the snow accumulated by the screw conveyors (6) is compacted by the compacting plate (10).
2. The motor vehicle according to claim 1 **characterized in that** it comprising at least one side snow scoop (11) in the form of a belt conveyor mounted on the device truss.
3. The motor vehicle according to claim 1 or 2 **characterized in that** the side snow scoop (11) comprising a chain (14) with a combs (15), set in motion by side shaft (12) held in side bevel gear (9) powered by the screw conveyor (6) shaft.
4. The motor vehicle according to claim 1 or 2 **characterized in that** it comprises at least one actuator (4) connecting a functional part (5) of the truss with its main beam (3) facilitating swinging motion of the functional part (5) of the truss relative to main beam (3).

Patentansprüche

1. Kraftfahrzeug (1) mit einer Einrichtung zur Nivellierung der Schlittenstrecke, wobei das Fahrzeug ein Triebwerk (81, 82, 83, 84) aufweist, wobei die Einrichtung ein an einem Tragrahmen (2) des Kraftfahrzeugs (1) angebrachtes Fachwerk (5) aufweist, wobei mindestens zwei Schneckenförderer (6) im Fachwerk der Einrichtung aufgehängt sind, und von der Seite des Kraftfahrzeugs durch eine offene Wanne (7) geschützt sind, wobei jeder Schneckenförderer (6) eine Welle mit einem inneren Ende (61), das mit der Antriebseinheit verbunden ist, und einem

äußeren Ende (62), das im Fachwerk hängt, aufweist, wobei jeder der Schneckenförderer (6) um seine Drehachse rotiert, so dass der gesammelte Schnee zum inneren Ende (61) der Schneckenförderer (6) hin gelenkt wird, und wobei er eine Knetplatte (10) aufweist, die am Tragrahmen (2) des Kraftfahrzeugs (1) hinter der offenen Wanne (7) der Schneckenförderer (6) kraftfahrzeugseitig aufgehängt ist, und der von den Schneckenförderern (6) geförderte Schnee durch die Knetplatte (10) verdichtet wird.

2. Kraftfahrzeug nach Anspruch 1, **dadurch gekennzeichnet, dass** es mindestens einen seitlichen Schneeräumer (11) aufweist, der ein am Fachwerk der Vorrichtung befestigter Bandförderer ist.
3. Kraftfahrzeug nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der seitliche Schneeräumer (11) eine Kette (14) mit Kämme (15) aufweist, die von einer Seitenwelle (12) betätigt wird, die in einem Seitenwinkelgetriebe (9) gelagert ist, das von einer Welle des Schneckenförderers (6) angetrieben wird.
4. Kraftfahrzeug nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** es mindestens einen Aktuator (4) aufweist, der das Arbeitsteil (5) des Fachwerks mit seiner Haupttraverse (3) verbindet, um eine Pendelbewegung des Arbeitsteils (5) des Fachwerks relativ zur Haupttraverse (3) zu ermöglichen.

Revendications

1. Véhicule à moteur (1) avec un dispositif d'alignement de piste de luge, le véhicule ayant une unité d'entraînement (81, 82, 83, 84), le dispositif ayant un treillis (5) monté sur le châssis de support (2) du véhicule à moteur (1), au moins deux convoyeurs à vis (6) suspendues au treillis du dispositif et protégées du côté du véhicule à moteur par une auge ouverte (7), chaque convoyeur à vis (6) ayant un arbre dont l'extrémité intérieure (61) est reliée à l'unité d'entraînement et dont l'extrémité extérieure (62) est suspendue au treillis, chaque convoyeur à vis (6) tournant autour de son axe de rotation de manière à ce que la neige collectée soit dirigée vers l'extrémité intérieure (61) des convoyeurs à vis (6), et comporte une plaque de compression (10), suspendue au châssis de support (2) du véhicule à moteur (1) derrière l'auge ouverte (7) des convoyeurs à vis (6) du côté du véhicule à moteur, et la neige transportée par les convoyeurs à vis (6) est compactée par la plaque de compression (10).
2. Véhicule à moteur selon la revendication 1, **caractérisé en ce qu'il** possède au moins un racleur latéral (11) de neige, étant un convoyeur à bande

attaché au treillis du dispositif.

3. Véhicule à moteur selon la revendication 1 ou 2, **caractérisé en ce que** le racleur latéral (11) est muni d'une chaîne (14) à peignes (15), actionnée par l'arbre latéral (12) encastré dans un engrenage conique latéral (9) entraîné par l'arbre de la convoyeur à vis (6). 5
4. Véhicule à moteur selon la revendication 1 ou 2, **caractérisé en ce qu'il** comporte au moins un actionneur (4) reliant la partie active (5) du treillis à sa poutre principale (3) pour le mouvement d'oscillation de la partie active (5) du treillis par rapport à la poutre principale (3). 10 15

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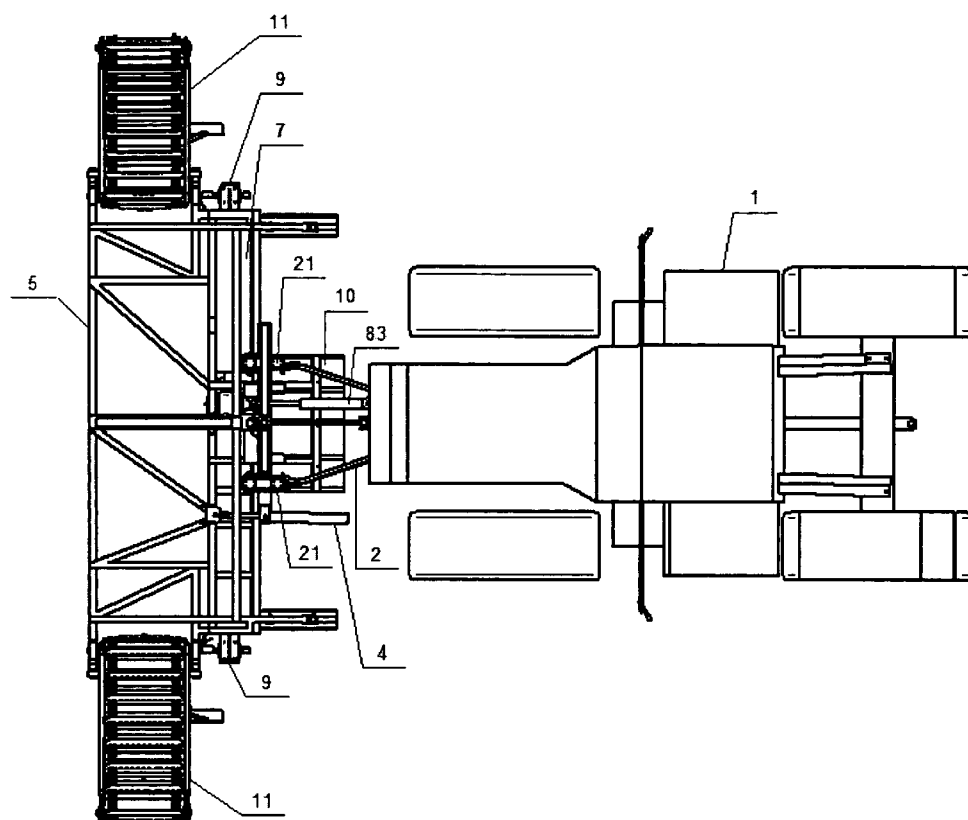


Fig. 1

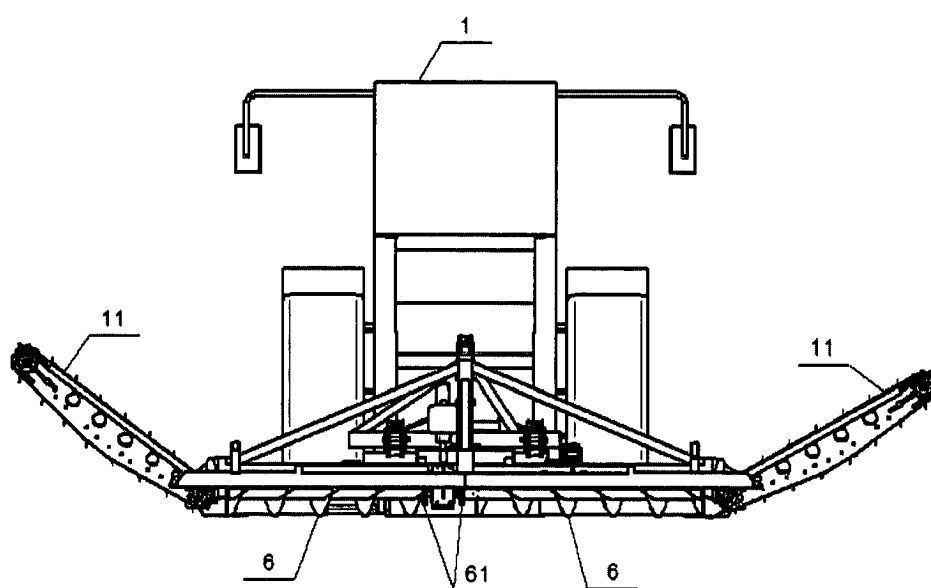


Fig. 2

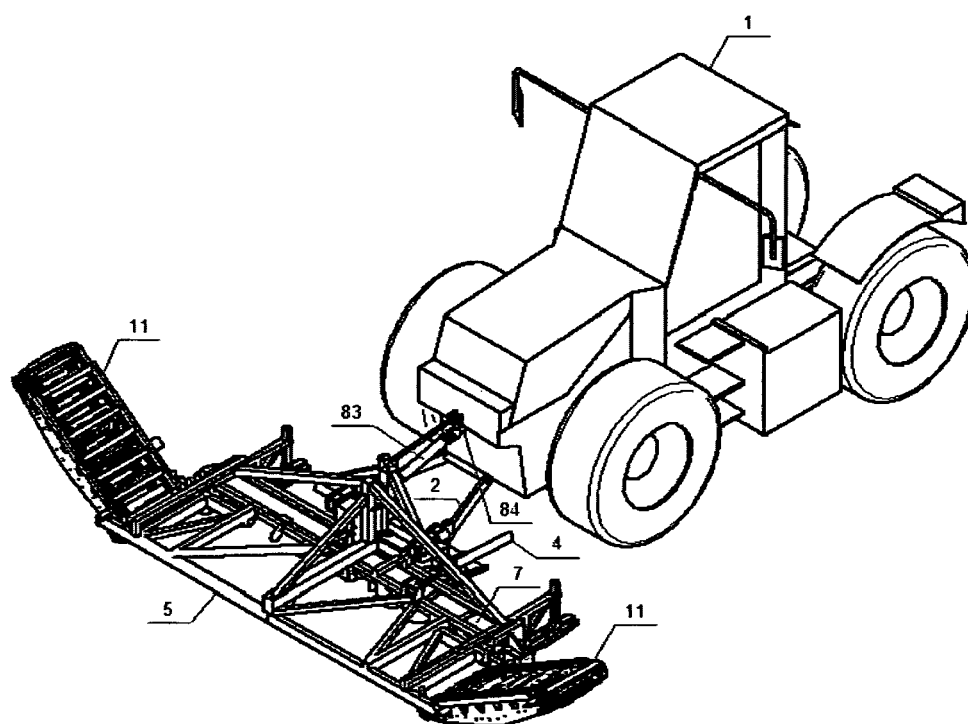


Fig. 3

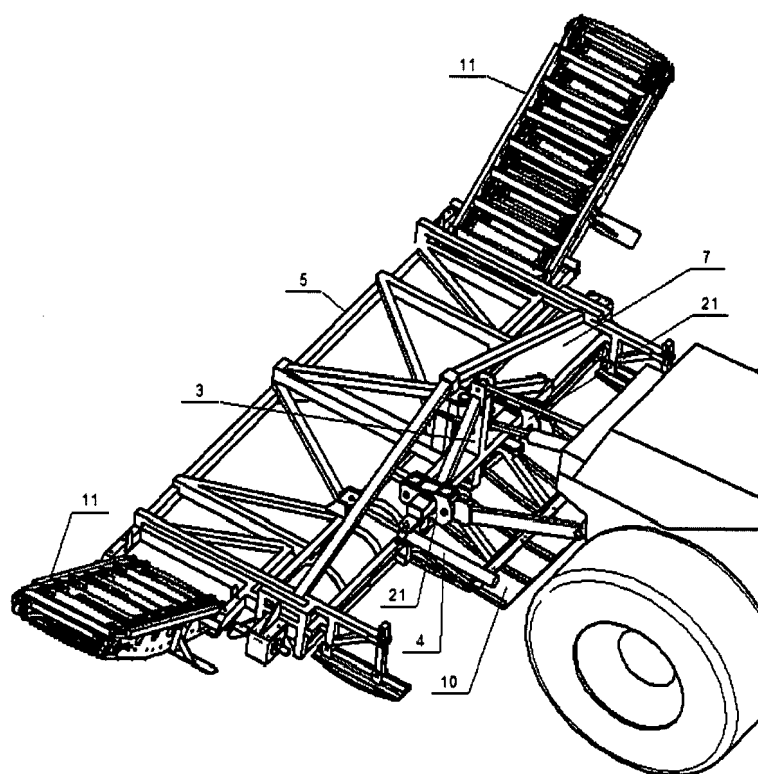


Fig. 4

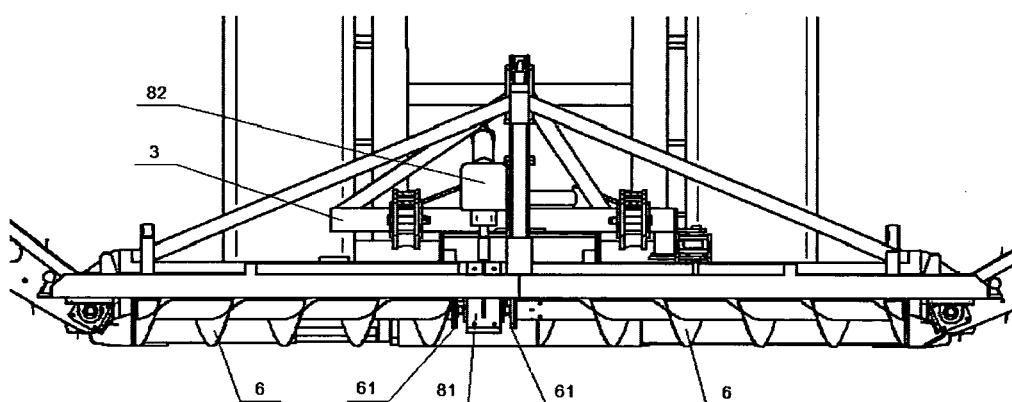


Fig. 5

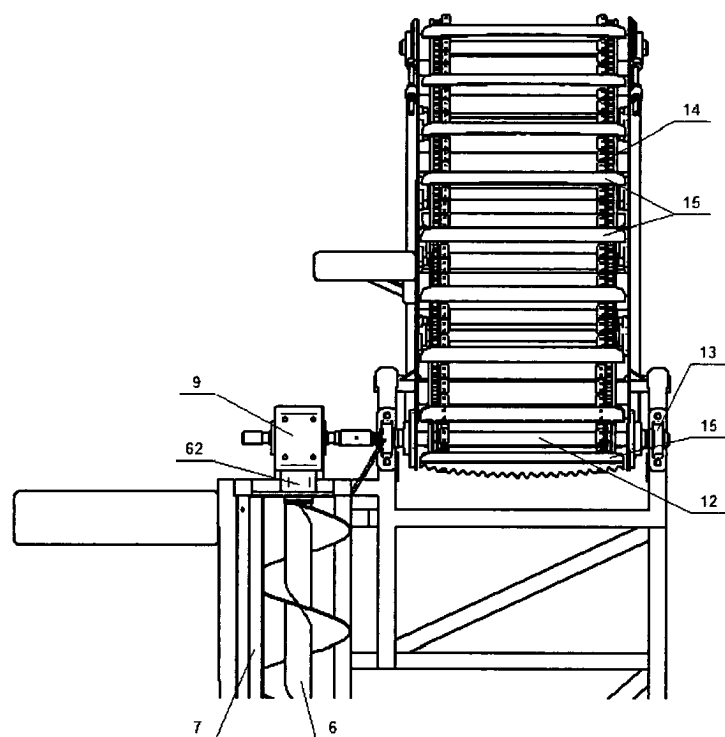


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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