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(54) **METHOD AND DEVICE RELATED TO SNOW REMOVAL**

VERFAHREN UND VORRICHTUNG ZUR ENTFERNUNG VON SCHNEE

PROCÉDÉ ET DISPOSITIF LIÉS AU DÉNEIGEMENT

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Description

Technical area

[0001] The present invention refers to a method for the removal of snow from tracks or track areas for track-bound vehicles in accordance with claim 1. The invention also concerns a device.

Background of the invention

[0002] There is a problem in achieving a time-effective and adequate clearing of snow from tracks or track areas for track-bound vehicles. An example that can be cited is the clearing of snow from railway tracks and in particular when several tracks are arranged abreast, as is normally the case in railway stations, railway yards, etc. A traditional ploughing off of tracks where the snow lands on both sides of a track entails problems with the adjacent tracks since the snow lands on them. Even switches arranged between tracks are difficult to free from snow.

[0003] US 1284873 A discloses a track cleaning machine adapted for removing snow from railway tracks and reducing the snow to water so that the same may be delivered to one side of the track way. The machine should be able to clear the trackway quickly and economically of snow. In order to clear a "sufficiently wide passage" the machine uses a scoop having a sideways extending front end. The sides 9 of the scoop body (in the form of a inverted plow) are turned inwardly at their upper ends providing overhead walls 17 defining the top of the snow passage and providing a housed-in delivery end. By reason of this construction the snow will be guided by the front edge 6 and the surfaces 9 and 17 onto the carrier 15 which is continuously revolved as a kind of a wide conveyor belt.

[0004] CH 329289 A discloses a mobile motor driven road sweeper providing slanted brushes in front of the front wheels. Said two brushes are used for removing snow from the area in front of the front wheels in order to avoid creating a pressed snowy or icy track on the floor. Such track of frozen and densely compressed snow is dangerous for jet planes namely on the runway of an airport and should be avoided.

[0005] US 5695574 A discloses a device for removing debris on upper surfaces of the ties of a railroad track adjacent to the rails. Each pair of the cleaning assemblies includes two motorized rotatable brushes adapted to be positioned on both sides of a respective rail. Each brush is also adapted to be vertically displaced with respect to the rails.

Goal of the invention

[0006] A goal of the present invention is to make available a method and a device that are extremely advantageous for the removal of snow from snowy areas. The goal of the invention is met in that the method and the device have the characteristics indicated in the claims.

Advantages of the invention

[0007] The invention makes possible a time-effective collection and removal of snow where the removal of collected snow takes place under volume reduction. The invention has both technical and economic advantages.

Short description of the drawings

[0008] An exemplary embodiment of the invention will be described in detail in the following with reference made to the attached drawings.

Figure 1 shows a device in accordance with the invention in a perspective view.
Figure 2 shows the snow collection device of the device at work.
Figure 3 shows a longitudinal section through the snow collection device.
Figure 4 shows the snow collection device of the device with its side brushes in parking position.
Figure 5 shows a transport of the device between two positions of use.

Detailed description of the exemplary embodiment shown

[0009] The snow removal device 1 shown in figure 1 comprises a snow collection device 10, a snow melting device 50, and a liquid container 70. The components included in the device 1 are normally arranged as in a train set. In the exemplary embodiment shown the snow melting device 50 is carried by a first railway carriage 51 and the liquid container 70 is carried by another railway carriage 71. Railway wheels 80 are shown in the figures. Coupling devices (not shown) are arranged between the carriages. Normally, a driving device in the form, for example, of a locomotive 100 is coupled to the back end of the device 1 for, among other things, taking care of driving forward along a railway track whose rails are designated with 151 and 152.

[0010] A driver's cab 200 is arranged in the front end of the first carriage 51, as a result of which an operator has a good view of the snow collection device 10 during forward travel in the working direction A of the device 1.

[0011] The snow collection device 10 is built up around a frame 11 that is coupled to the front end of the first railway carriage 51. Railway wheels 12 are provided for further supporting of the frame 11.

[0012] The snow collection device 10 comprises a snow collection aggregate 20 with a rotating brush 21 (arrow B) and at least one feeder screw 22 that feeds the snow from two directions and via a possible fan (not shown) to a transport conduit 30. What was just cited recalls the method of operation for a so-called snow thrower. The rotating brush 21 extends like the feeder

screw/the feeder screws substantially over the entire width of the snow collection aggregate 20, that brings it about that the desired snow clearance of a railway track can be achieved in this way.

[0013] However, there is sometimes a need to increase the width of the snow clearance, for example, in railway yards. According to the invention two side brushes 41, 42 are arranged at the front edge of the frame 11, as is apparent from the figures. In figures 1-3 the side brushes 41, 42 are in a working position where they form a V-formation and are driven in a rotational direction that sweeps the snow in on the track and inside the working width of the snow collection aggregate 20.

[0014] The conduit 30 empties into the snow melting device 50, that is set up to melt the snow that comes into the snow melting device 50 via the snow collection device 10 and via the conduit 30. The detailed construction of the device 50 can be varied in many different ways but often a pouring on of warm water, water vapour, etc. is used. Alternatively, some other type of heat supply is used in order to convert the snow to melted water.

[0015] Melted water formed in the snow melting device 50 is transferred to the liquid container 70 via a line that is not shown. In some cases it is possible to make a continuous discharge of liquid to the track surroundings from the liquid container 70. In other cases, restrictions apply that require that one is forced to localize the discharge of liquid to indicated areas. In such cases the accumulated capacity of the liquid container 70 is especially valuable since the method in accordance with the invention can accumulate orders of magnitude of a 5-10 times greater volume of snow than its own volume. This brings about great advantages of transport and increased effectiveness as concerns the clearance of snow.

[0016] It is noted that certain auxiliary equipment, drive equipment and safety equipment have been omitted in the drawings in order to increase the clarity.

[0017] A saving of energy and a reduced risk of freezing can be obtained by heat-insulating the snow melting arrangement 50 and the liquid container 70.

[0018] During the clearing of snow by the device in accordance with the invention it can be arranged that the operator present in the driver's compartment also remotely manoeuvres the locomotive 100 responsible for the transport movement of the device.

[0019] In figure 4 the side brushes 41, 42 are pivoted inwards and hoisted up to an inactive parking position.

[0020] Figure 5 exemplifies a carriage-borne transport of the snow removal arrangement 1 to a new site of use, whereby the snow collection arrangement 10 is transported on a coupled carriage 300. There is also the possibility here of arranging the snow removal device 1 so that it can be lifted relative to the carriage 51 so that the transport can take place without the carriage 300.

[0021] It is apparent that the side brushes 41, 42 can be provided with such a reach and ability to be raised that they can be used, for example, to sweep platforms.

[0022] Normally, the side brushes 41, 42 can be raised up and lowered down individually relative to the frame 11 with the aid of arranged controls and, for example, hydraulic cylinders.

[0023] Normally, the side brushes 41, 42 can be pivoted in and out individually relative to the frame 11 with the aid of arranged swivel bearings and, for example, hydraulic cylinders.

[0024] Normally, the side brushes 41, 42 can be driven in rotation individually by hydraulic motors.

[0025] It is apparent that the detailed construction applied to the movement pattern of the side brushes 41, 42 can of course be varied over what has been exemplified, whereby, for example, the side brushes can also be moved individually in oblique positions in another joint or direction.

[0026] Due to the fact that the side brushes 41, 42 can be individually manoeuvred and driven, they can be given different adjustments and jobs between themselves, which is obviously advantageous. For example, one side brush can be working while the other side brush is in a parked position, and so forth.

[0027] It is of course apparent that many variations are possible within the scope of the present inventive concept. Variations of components are naturally possible.

[0028] Thus, the invention is not limited to what was shown and described but rather changes and modifications are of course possible within the scope of the attached claims.

Claims

1. A method for the removal of snow from tracks or track areas for track-bound vehicles, wherein the snow is transported by a snow collection device (10) to a snow melting device (50) where the snow is melted down to water, after which the melted water is transported to a liquid container (70) from which the melted water is tapped off as required, wherein in addition to a rotating brush (21) of a snow collection aggregate (20) at the front end of the vehicle side brushes (41, 42) are used at the front edge of the aggregate (20) that increase the width of the snow clearance of the snow collection device (10) by moving snow located on the outsides of the tracks to the working area of the snow collection device (10), and that the side brushes (41, 42) can be hoisted up and pivoted into a parking position.

2. The method according to claim 1, **characterized in that** the side brushes (41, 42) can be individually maneuvered.

3. The method according to claim 1 or 2, **characterized in that** the snow collection device (10), the snow melting device (50) and the liquid container (70) are arranged on a train set (51, 71, 100).

4. A device (1) for the removal of snow from tracks or track areas for track-bound vehicles, wherein the device (1) comprises a snow collection device (10) that comprises at the front end of the vehicle a snow collection aggregate (20) wherein the device (1) further comprises a snow melting device (50), **characterized in that** the aggregate comprises in addition to a rotating brush (21), two rotating side brushes (41, 42) that increase the width of the snow clearance of the snow collection device (10) by moving snow located on the outsides of the tracks to the working area of the snow collection device (10) and that can be hoisted up and pivoted into a parking position.

5. The device according to claim 4, **characterized in that** the side brushes (41, 42) are arranged for individual maneuvering.

6. The device according to claim 4 or 5, **characterized in that** the snow collection device (10) is arranged to communicate with the snow melting device (50) that for its part is arranged to communicate with a liquid container (70).

7. The device according to any one of claims 4 - 6, **characterized in that** the device (1) is integrated with a train set (51, 71, 100).

Patentansprüche

1. Verfahren zum Entfernen von Schnee von Gleisen oder von Gleisbereichen für schienengebundene Fahrzeuge, wobei der Schnee von einer Schneesammelvorrichtung (10) zu einer Schneeschmelzvorrichtung (50) transportiert wird, wo der Schnee zu Wasser geschmolzen wird, woraufhin das geschmolzene Wasser zu einem Flüssigkeitsbehälter (70) transportiert wird, von dem das geschmolzene Wasser, wenn erforderlich, abgegriffen wird, wobei zusätzlich zu einer rotierenden Bürste (21) eines Schneesammelaggregats (20) am Stirnende des Fahrzeugs Seitenbürsten (41, 42) an der Vorderkante des Aggregats (20) verwendet werden, die die Schneeräumbreite der Schneesammelvorrichtung (10) vergrößern, indem sie Schnee, der sich auf den Außenseiten der Gleise befindet, in den Arbeitsbereich der Schneesammelvorrichtung (10) bewegen, und dass die Seitenbürsten (41, 42) angehoben und in eine Parkposition geschwenkt werden können.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die Seitenbürsten (41, 42) individuell manövriert werden können.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schneesammelvorrichtung (10), die Schneeschmelzvorrichtung (50) und der Flüssigkeitsbehälter (70) auf einem Zugverband (51, 71, 100) angeordnet sind.

4. Vorrichtung (1) zum Entfernen von Schnee von Gleisen oder Gleisbereichen für schienengebundene Fahrzeuge, wobei die Vorrichtung (1) eine Schneesammelvorrichtung (10) umfasst, die am Stirnende des Fahrzeugs ein Schneesammelaggregat (20) umfasst, wobei die Vorrichtung (1) ferner eine Schneeschmelzvorrichtung (50) umfasst, **dadurch gekennzeichnet, dass** das Aggregat zusätzlich zu einer rotierenden Bürste (21) zwei rotierende Seitenbürsten (41, 42), die die Schneeräumbreite der Schneesammelvorrichtung (10) vergrößern, indem sie Schnee, der sich auf den Außenseiten der Schienen befindet, in den Arbeitsbereich der Schneesammelvorrichtung (10) bewegen, und die angehoben und in eine Parkposition geschwenkt werden können, umfasst.

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Seitenbürsten (41, 42) zum individuellen Manövrieren ausgelegt sind.

6. Vorrichtung nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** die Schneesammelvorrichtung (10) ausgelegt ist, mit der Schneeschmelzvorrichtung (50) zu kommunizieren, die ihrerseits ausgelegt ist, mit einem Flüssigkeitsbehälter (70) zu kommunizieren.

7. Vorrichtung nach einem der Ansprüche 4-6, **dadurch gekennzeichnet, dass** die Vorrichtung (1) in einen Zugverband (51, 71, 100) integriert ist.

Revendications

1. Procédé pour le déneigement de rails ou de zones de rails pour des véhicules ferroviaires, dans lequel la neige est transportée par un dispositif de collecte de neige (10) jusqu'à un dispositif de fonte de neige (50), dans lequel la neige fond pour donner de l'eau, après quoi, l'eau de fonte est transportée jusqu'à un réservoir de liquide (70) depuis lequel l'eau de fonte est prélevée au besoin, dans lequel, en plus d'une brosse rotative (21) d'une unité de collecte de neige (20) à l'extrémité avant du véhicule, des brosses latérales (41, 42) sont utilisées au niveau du bord avant de l'unité (20), lesquelles augmentent la largeur de dégagement de neige du dispositif de collecte de neige (10) en déplaçant la neige située sur les côtés extérieurs des rails jusqu'à la zone de travail du dispositif de collecte de neige (10), les brosses latérales (41, 42) pouvant être relevées et pivotées dans une position de rangement.

2. Procédé selon la revendication 1, **caractérisé en ce**

que les brosses latérales (41, 42) peuvent être manoeuvrées individuellement.

3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** le dispositif de collecte de neige (10), le dispositif de fonte de neige (50) et le réservoir de liquide (70) sont disposés sur un train (51, 71, 100).

4. Dispositif (1) pour le déneigement de rails ou de zones de rails pour des véhicules ferroviaires, dans lequel le dispositif (1) comprend un dispositif de collecte de neige (10) qui comprend, à l'extrémité avant du véhicule, une unité de collecte de neige (20), dans lequel le dispositif (1) comprend en outre un dispositif de fonte de neige (50), **caractérisé en ce que** l'unité comprend en outre une brosse rotative (21), deux brosses latérales rotatives (41, 42) qui augmentent la largeur du dégagement de neige du dispositif de collecte de neige (10) en déplaçant la neige située sur les côtés extérieurs des rails jusqu'à la zone de travail du dispositif de collecte de neige (10), et qui peuvent être relevées et pivotées dans une position de rangement.

5. Dispositif selon la revendication 4, **caractérisé en ce que** les brosses latérales (41, 42) sont disposées de manière à pouvoir être manoeuvrées individuellement.

6. Dispositif selon la revendication 4 ou 5, **caractérisé en ce que** le dispositif de collecte de neige (10) est prévu pour communiquer avec le dispositif de fonte de neige (50) qui, pour sa part, est prévu pour communiquer avec un réservoir de liquide (70).

7. Dispositif selon l'une quelconque des revendications 4 à 6, **caractérisé en ce que** le dispositif (1) est intégré à un train (51, 71, 100).

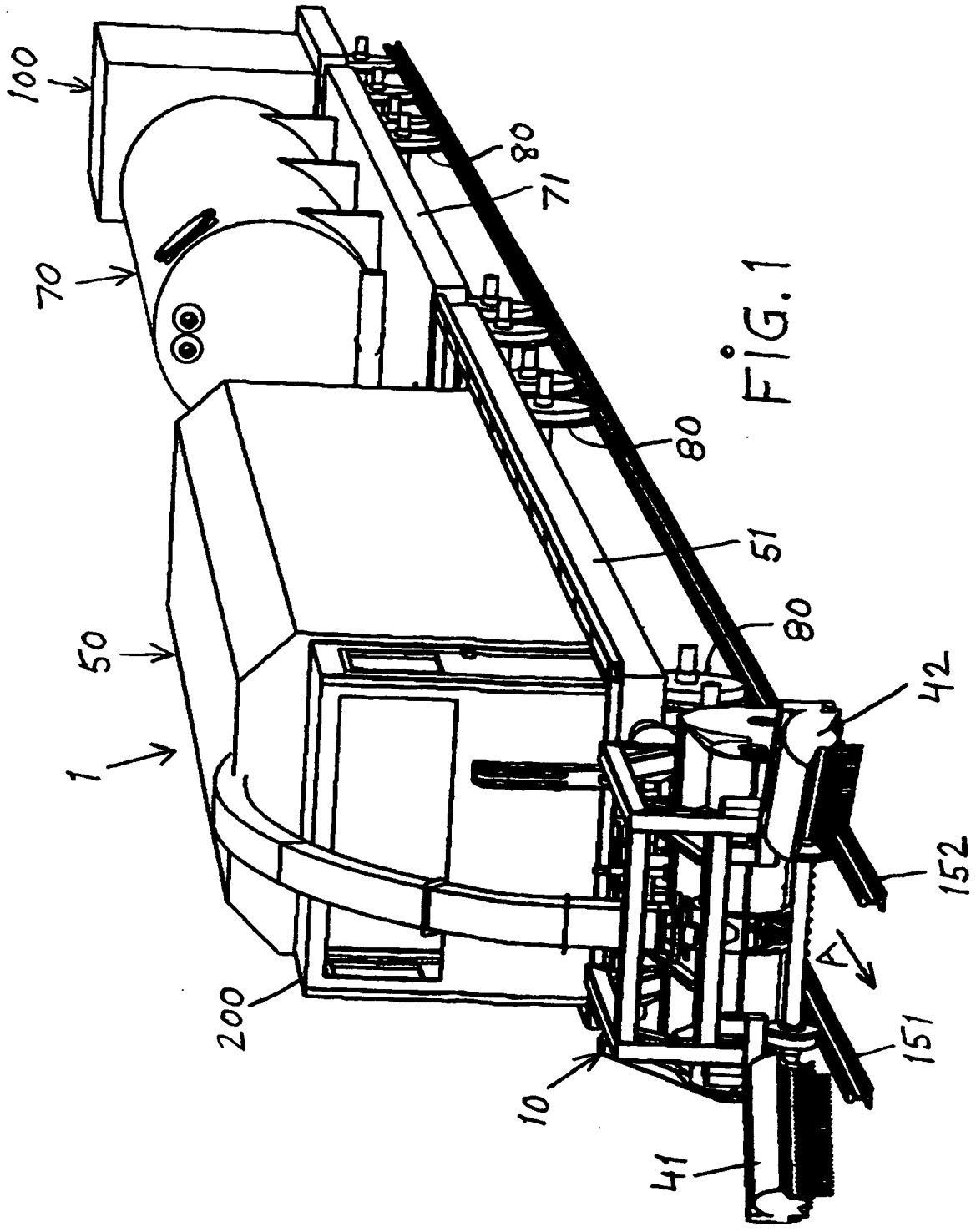

FIG. 1

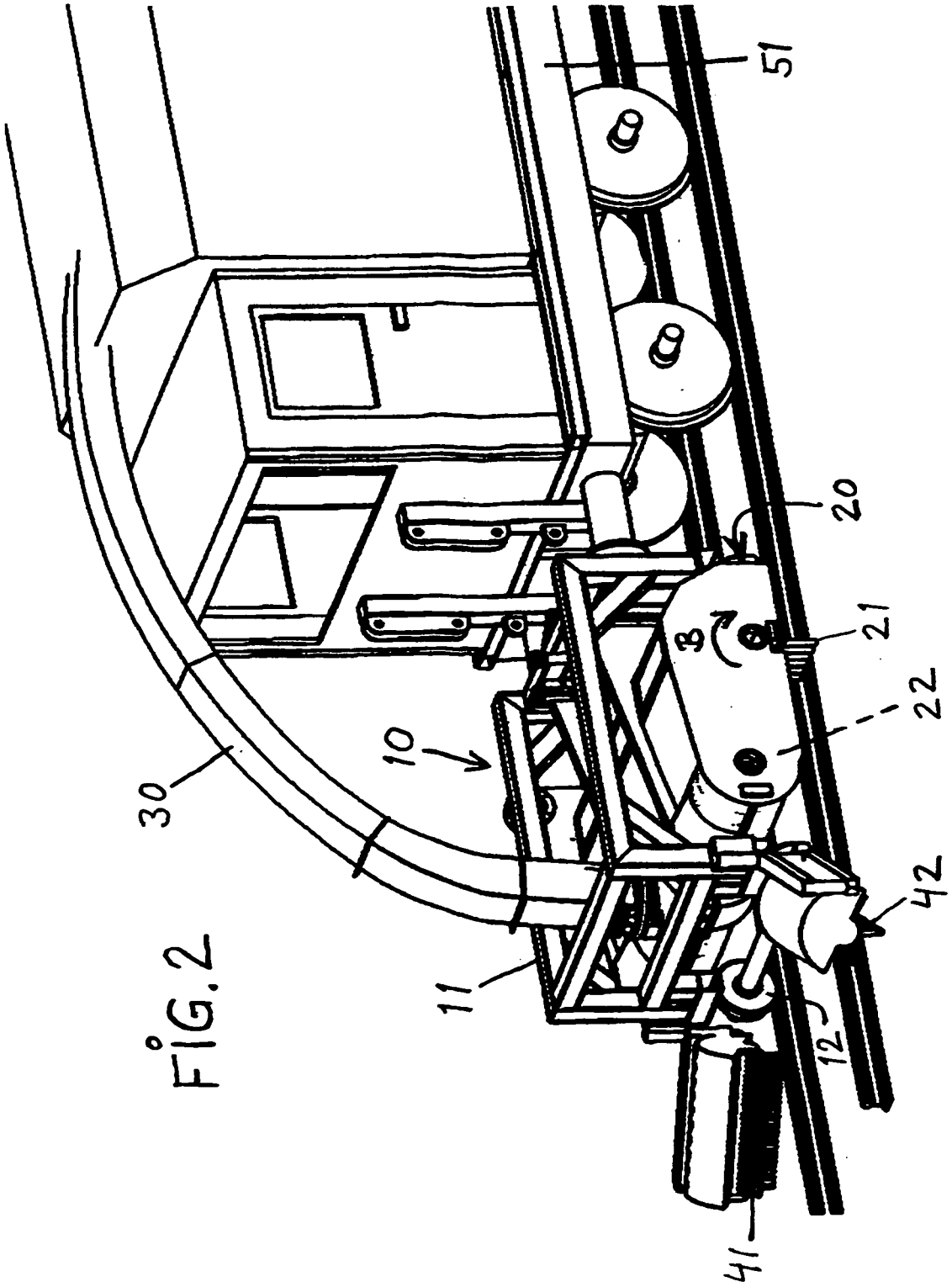

FIG. 2

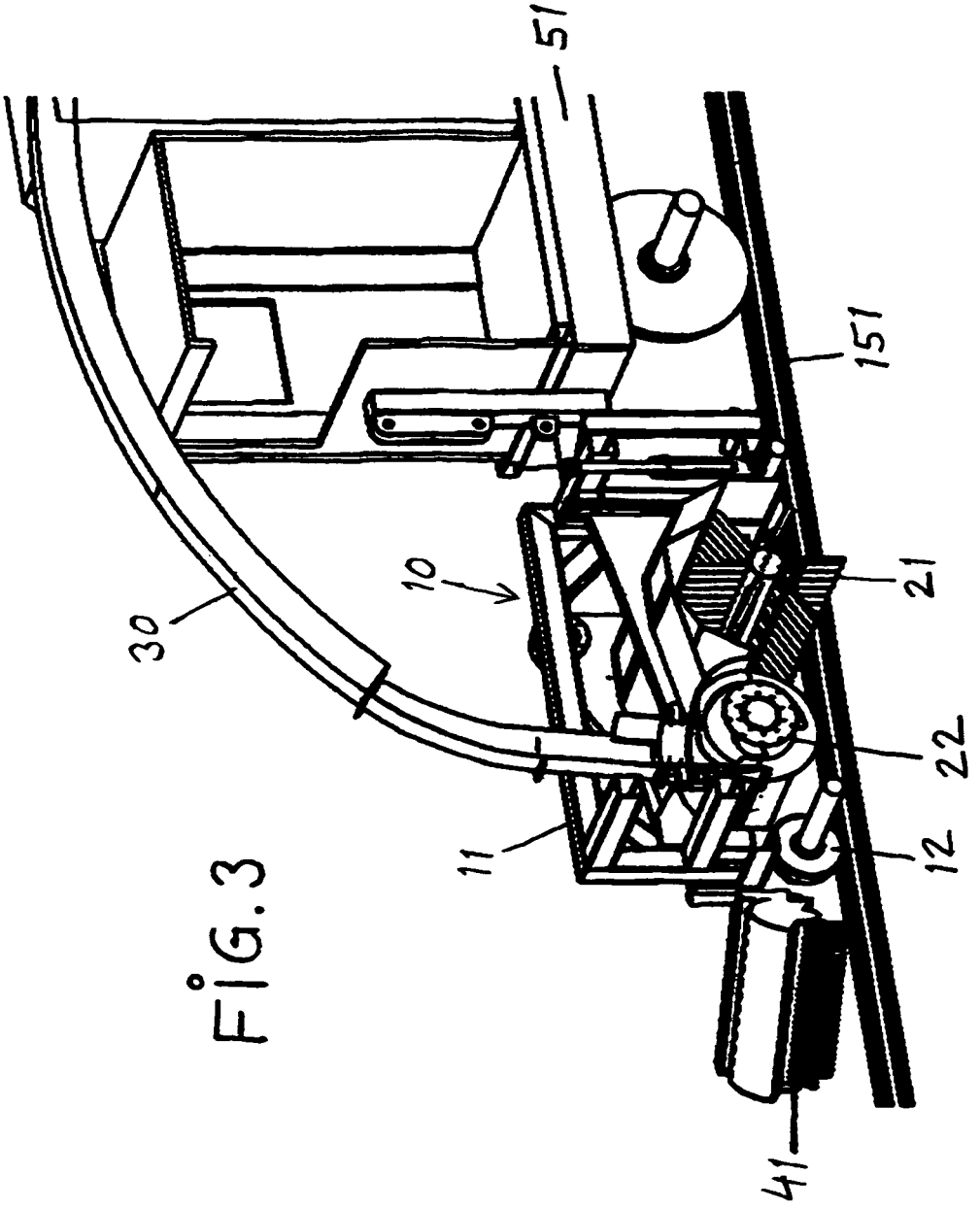

FIG. 3

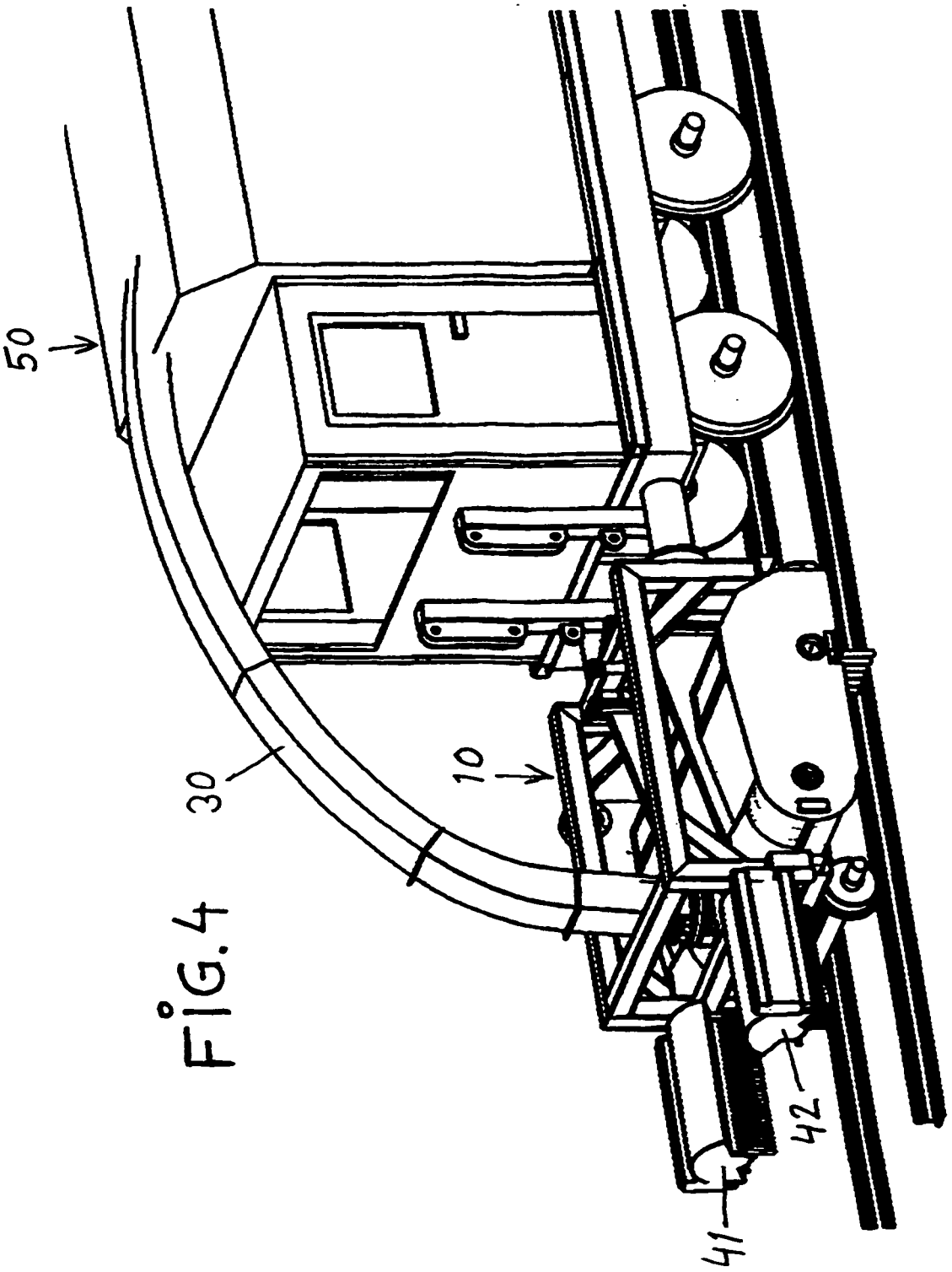

FIG. 4

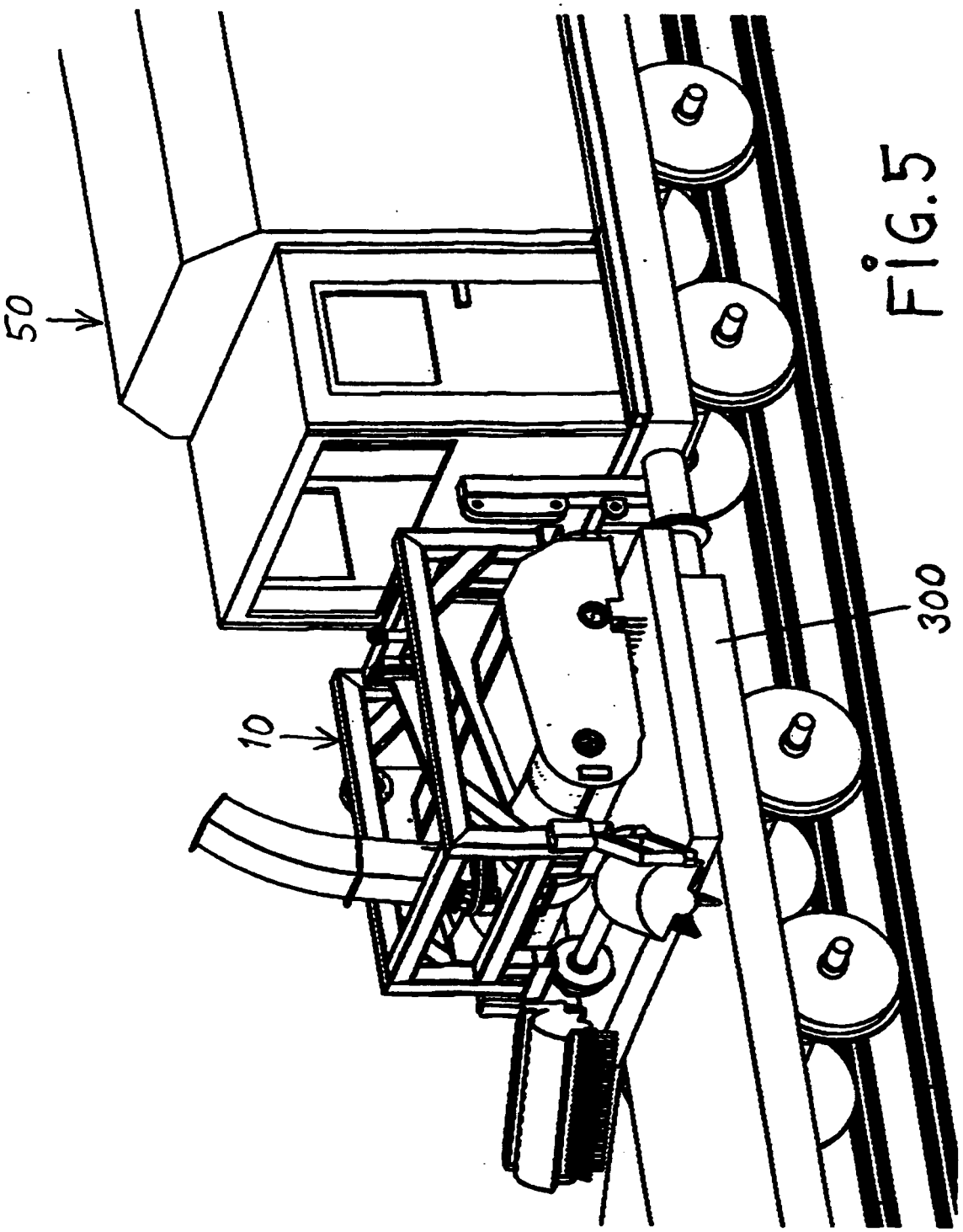

FIG.5

REFERENCES CITED IN THE DESCRIPTION

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