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(54) **Fluidized soil material supply machine**

Maschine zum Zuführen von Verflüssigter Erde

Machine de distribution de materiaux terreux fluidisés

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a fluidized soil material supply machine for supplying, to a mixing device, a mixed soil of sediment and solidifying material, water and the like as a material for the fluidized soil used for backfilling and infilling of space.

[0002] There is provided, in a known art, a fluidizing technology for mixing and stirring the sediment, the solidifying material, the water and the like to form a fluidized soil and utilizing the thus fluidized soil for the backfilling and infilling of a space.

[0003] Such fluidizing technology can effectively utilize surplus soil waste from construction such as excavated or dug soil, can contribute to labor saving for the backfilling working and is suitable for filling a narrow space.

[0004] The fluidized soil is produced by a fluidizing plant equipped with a soil dissolving plant for producing a regulated mud by mixing the excavated soil and water and a mixing plant for mixing such regulated mud, water and cement as a fluidized soil.

[0005] Furthermore, the fluidized soil mentioned above is produced by supplying the excavated soil into a mixing device (drum-type or paddle-type structure) of a mixer truck by using a bucket-type loader and adding thereafter the cement and water, which are then dissolved and mixed.

[0006] However, since the fluidizing plant of the type mentioned above has complicated equipment or arrangement and is not movable, it is difficult to convey the fluidized soil in a case where a working site is apart from the fluidizing plant.

[0007] Further, in the case of using the mixer truck as mentioned above, the fluidized soil can be easily conveyed or transferred with cheap cost. However, in this method, there is a problem such that when the excavated soil is supplied to the mixing device in the mixer truck, viscous soil easily lumps and clogs an entrance port of the mixing device. Furthermore, the excavated soil is hard to be dissolved and likely remains as lump at the time when the mixing device of the mixer truck is rotated to dissolve the excavated soil, thus providing worse mixing ability or efficiency, and particularly, when the viscous soil is hard to be dissolved, thus much time is required for a dissolution of it.

[0008] Still furthermore, although the excavated soil is supplied by using the bucket of a hydraulic shovel and the amount of the excavated soil is controlled by counting the supplying times by means of the bucket, since the supplying amount at each time by using the bucket is not always constant, it is difficult to exactly control the excavated soil supply amount.

SUMMARY OF THE INVENTION

[0009] An object of the present invention is to substantially eliminate defects or drawbacks encountered in the prior art and to provide a fluidized soil material supply machine capable of obtaining a fluidized soil composed of uniformly mixed materials such as raw soil (e.g. excavated or dug soil), solidifying material, water and the like.

[0010] This and other objects can be achieved according to the present invention by providing a fluidized soil material supply machine comprising:

a machine body provided with a traveling member;
a raw soil hopper which is mounted to the machine body and in which a raw soil is thrown;

a raw soil conveyer mounted to the machine body and adapted to convey the raw soil from the raw soil hopper;

a solidifying material supply device mounted to the machine body and adapted to supply a solidifying material;

a first mixer mounted to the machine body and adapted to mix the raw soil fed through the raw soil conveyer and the solidifying material supplied from the solidifying material supply device to thereby produce a mixed soil;

a mixed soil conveyer for conveying the mixed soil produced in said first mixer; and

a liquid supply unit for supplying a liquid to be mixed with the raw soil and the solidifying material; and wherein

the mixed soil conveyed through the mixed soil conveyer and the liquid supplied through the liquid supply unit are mixed in a second mixing device operatively connected to the mixed soil conveyer.

[0011] In a preferred embodiment, the liquid supply unit is provided with a liquid supply port disposed to a discharge port of the mixed soil conveyer. The liquid supply unit includes a liquid tank which is disposed independently from the machine body. The solidifying material is a cement and the liquid is a water.

[0012] In a further preferred embodiment, the fluidized soil material supply machine further comprises: a raw soil supply amount detection means; a solidifying material supply amount detection means; a liquid supply amount detection means; and a control unit operatively connected to the raw soil supply amount detection means, the solidifying material supply amount detection means and the liquid supply amount detection means and adapted to set required full raw soil amount, required full solidifying material amount and required full liquid amount and to stop operations of the raw soil conveyer, the solidifying material supply device and the liquid supply device at a time when the respective supply amounts

reach the set full amounts.

[0013] A recording device may be further disposed to the controller for recording the respective supply amounts inputted in the controller at the time when the operations of the raw soil conveyer, the solidifying material supply device and the liquid supply device are stopped.

[0014] According to the fluidized soil material supply machine of the present invention of the structures mentioned above, as the material of the fluidized soil, the mixed soil of the finely granulated raw soil and the solidifying material and the water can be easily supplied to the mixing device while monitoring the amounts of the mixed soil and the water and can be fully mixed by rotating the mixing device to be a uniformly blended fluidized soil.

[0015] The raw soil and the solidifying material can be especially crushed, mixed and stirred in the mixer, the raw soil even in the form of viscous clay can be finely granulated and adequately mixed with the solidifying material, whereby the mixed soil does not clog the inlet port of the mixing device and easily dissolved and becomes a uniformly mixed fluidized soil in a short time.

[0016] Furthermore, the material supply machine comprising the row soil supply device, the solidifying material supply device and the liquid supply device can self-travel and is movable to a working site or near, thus being available, and the fluidized soil thus produced by the mixing device can be recycled at the working site.

[0017] When the mixing device is disposed to a mixer truck, the mobility or maneuverability of the mixing device will be further improved, and even if the stationary mixing device is used, it can be lifted up and loaded on a truck by a crane and then conveyed by the truck, thereby a fluidized soil producing system is movable.

[0018] The mixed soil and the liquid (water) can be easily supplied to the mixing device by arranging the water discharge port at a portion near the discharge portion of the mixed soil conveyer.

[0019] When the liquid tank is disposed independently from the machine body, it is not necessary to form a space to the machine body to dispose the liquid tank, and hence, the machine body can be made compact in size and easily movable.

[0020] According to the structure provided with the controller, the raw soil, the solidifying material and the water can be automatically supplied to the mixing device by the set amounts thereof, which can improve the operational ability and efficiency. By disposing a recording device to the controller, the inputted and supplied full amounts of the respective materials can be recorded, and thus, the quality and blended amounts of the respective material for the fluidized soil can be easily controlled and managed.

[0021] The nature and further characteristic features of the present invention will be made further clear from the following descriptions made with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] In the accompanying drawings:

Fig. 1 is a side view showing a general structure of a fluidized soil material supply machine according to a first embodiment of the present invention;

Fig. 2 is a plan view showing a general structure of the fluidized soil material supply machine of Fig. 1;

Fig. 3 is a rear view showing the general structure of the fluidized soil material supply machine of Fig. 1;

Fig. 4 is an illustration showing a fluidized soil material supplying operation according to the first embodiment of Fig. 1;

Fig. 5 is a diagram showing a liquid supply device according to the first embodiment of Fig. 1;

Fig. 6 is a diagram showing a first example of a supply amount controller (control unit) according to the first embodiment of Fig. 1;

Fig. 7 is a diagram showing a second example of a supply amount controller (control unit) according to the first embodiment of Fig. 1;

Fig. 8 is a side view showing a general structure of a fluidized soil material supply machine of Fig. 1 in a state that a mixed soil conveyer (conveying device) of the supply machine is vertically swingable;

Fig. 9 is a plan view showing an example of an arrangement in which a liquid tank is disposed separately from a machine (vehicle) body; and

Fig. 10 is a side view showing one example of using a stationary type mixing device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] One preferred embodiment of the present invention will be first described hereunder with reference to Figs. 1 to 3.

[0024] Referring to Figs. 1 to 3, a fluidized soil material supply machine (vehicle) includes a machine (vehicle) body 1, and traveling members 2, 2 are mounted to both lateral side portions of the machine body 1. A mixer 3 is also mounted to the machine body 1 at an approximately central portion in the longitudinal direction thereof. A driving device such as engine, hydraulic pump or the like is located at a front side (right side as viewed in Fig. 1) of the machine body 1, and the driving device 4 is covered by a cover 5. Although it is preferred that the traveling members 2, 2 are constituted by crawlers, they may be constituted as wheels. Further, a boarding floor 1a is

formed to the machine body 1.

[0025] Further, it is to be noted that a soil as a material to be treated by the present invention such as excavated or dug soil will be mentioned herein as raw soil or merely a soil for the sake of convenience.

[0026] A mount frame 6 is mounted to the rear side portion of the machine body 1 so as to project therefrom in the longitudinal direction thereof and a raw soil conveyer (conveying device) 7 is mounted to this frame 6 so as to extend in the longitudinal direction. A raw soil hopper 8 is mounted to the frame 6 at a portion above the rear side portion of the raw soil conveyer 7. A solidifying material supply device 9 is disposed between the raw soil hopper 8 and the mixer 3 so as to cover the front side portion of the raw soil conveyer 7 from the upper portion thereof.

[0027] A mixed soil conveyer (conveying device) 10 is mounted to the lower portion of the machine body 1 so as to extend in the longitudinal direction thereof, and one side portion (rear side portion) in the conveying direction of the mixed soil conveyer 10 is positioned below the mixer 3 and the other side portion (front side portion) thereof extends forward over the machine body 1.

[0028] A liquid supply device 11 is mounted to lateral one side portion on the front side of the machine body 1 and a liquid tank 12 is also mounted to lateral one side portion on the rear side thereof. A liquid discharge means 13 is attached to a portion near the discharge end of the mixed soil conveyer 10 so as to be directed downward.

[0029] The liquid supply device 11, the liquid tank 12 and the liquid discharge means 13 constitute a liquid supply unit of the fluidized soil material supply machine of the present invention.

[0030] With reference to Fig. 4, the mixer 3 has a case (housing) 14 in which a soil cutter device 15 as a primary mixer and a plurality of impact hammer devices (rotor provided with rotators) 16 as a secondary mixer are located.

[0031] The raw soil conveyer 7 is composed of a driving wheel 17, a driven wheel 18 and an endless belt member 19 wound around these wheels 17 and 18. the discharge end of the raw soil conveyer 7 is positioned so as to project into the case 14 from an entrance port 20 formed to a side wall 14a of the case 14 of the mixer 3. The endless belt member 19 has a crawler structure composed of a plurality of iron plates which are connected together endlessly, but it may be formed of other belt structure.

[0032] A scraping rotor 21 is disposed near the discharge port of the hopper 8 so as to make constant the feed height b of the raw soil a. This material feed height b is a height of the raw soil a which is conveyed by the conveyer 7 towards the mixer 3. For this purpose, a raw soil sensor 7a for detecting the height of the soil on the conveyer 7 is arranged above the conveyer 7, and when the height of the raw soil a is more than a set value (for example, about 70% of the feed height b), the raw soil sensor 7a is made "ON" to thereby detect that the flow of the raw soil.

[0033] The solidifying material supply device 9 has a structure including a quantity supply mechanism 23 disposed at the discharge port of the hopper 22.

[0034] The mixed soil conveyer 10 is composed of a driving wheel 24, a driven wheel 25 and an endless belt member 26 wound around these wheels 24 and 25, and one side end in the conveying direction thereof is positioned below the discharge port 27 of the case 14 of the mixer 3.

[0035] The liquid supply device 11 includes, as shown in Fig. 5, a liquid pump 31 and a power source such as hydraulic motor, electric motor or the like for driving the liquid pump 31. The liquid pump 31 sucks a liquid in the liquid tank 12 through a suction port of the pump which is connected to the liquid tank 12 through a suction line 32 such as pipe or hose and supplies the liquid to a discharge line 33 such as pipe or hose.

[0036] The liquid discharge port 13 is composed of a pipe 34 to which the discharge line 33 is connected. The liquid discharge port 13 may be composed of the pipe or hose of the discharge line 33 as it is.

[0037] With reference to Fig. 4, the raw soil a such as excavated or dug soil thrown into the raw soil hopper 8 is adjusted in its predetermined height by the raw soil conveyer 7 and the scraping rotor 21 and then conveyed to the mixer 3. When the raw soil is conveyed, the raw soil sensor 7a is made "ON" and the determinate quantity supply mechanism 23 is driven. Then, a solidifying material such as cement in the hopper 22 is dropped by the determinate quantity supply mechanism 23 on the raw soil a now being conveyed. The solidifying material may be directly supplied into the mixer 3.

[0038] The raw soil a and the solidifying material conveyed into the case 14 of the mixer 3 is cut off by the soil cutter device 15 and then crushed, mixed and stirred by the impact hammer device 16 to produce a mixed soil c, which is thereafter discharged through the discharge port 27 of the mixer 3 on the mixed soil conveyer 10. The mixed soil c is then conveyed forward of the machine body 1 and fed into a mixing or kneading device 41 of a mixer truck 40 as shown in Fig. 1. At the same time, water is poured into the mixing device 41 through the liquid discharge port 13.

[0039] The mixing device 41 of the mixer truck 40 is then rotated to thereby mix the raw soil a and the solidifying material together with the water, thus producing the fluidized soil.

[0040] As mentioned above, according to the embodiment of the present invention, as the material of the fluidized soil, the mixed soil composed of the finely granulated raw soil and the solidifying material and the water can be easily supplied to the mixing device 41 of the mixer truck 40 while monitoring the amounts of the mixed soil and water, and the mixed soil and the water can be finely mixed by rotating the mixing device 41 of the mixer truck 40, thus producing the uniformly blended fluidized soil.

[0041] Particularly, since the raw soil and the solidifying material is crushed, mixed and stirred in the mixer 3, even if the raw soil is in the form of a viscous soil, the raw soil can be finely granulated and adequately mixed with the solidifying material.

[0042] Accordingly, the raw soil does not clog the inlet portion of the mixing device 41 of the mixer truck 40 and, moreover, the raw soil can be dissolved in a short time and finely mixed by rotating the mixing device 41, so that the uniformly blended fluidized soil can be produced.

[0043] Furthermore, the fluidized soil material machine for supplying the soil, solidifying material (cement) and water travels itself, it is excellent in mobility or maneuverability and it can be moved to a position near the working site or field, so that the fluidized soil thus produced by the mixer truck 40 can be recycled at that working site.

[0044] Still furthermore, the mixer truck 40 equipped with the mixing device 41 also travels itself, being excellent in mobility, and it travels to the working site while mixing the raw soil, solidifying material and water, which are supplied at the position near the working site, so that the fluidized soil can be efficiently recycled at that working site.

[0045] A first preferred example of control unit or system (controller) for controlling the supply amounts of the respective materials will be described hereunder.

[0046] The raw soil conveyer 7 is equipped with a rotation detecting sensor 51, as shown in Fig. 6, for detecting rotation (revolution) number of the driving wheel 17 rotated by a motor 50. The rotation number detected by the rotation detecting sensor 51 is inputted into the controller (control unit) 52, which serves to operate (calculate) the amount of the raw soil to be conveyed to the mixer 3 in accordance with the height b of the raw soil to be cut off , the width thereof and the detected rotating number.

[0047] The solidifying material supply device 9 mentioned hereinbefore is equipped with a rotation detecting sensor 54, as also shown in Fig. 6, for detecting a rotation number of the determinate quantity supply mechanism 23 driven by a motor 53 and the detected rotation number is inputted into the controller 52. The controller 52 also serves to calculate the amount of the solidifying material to be supplied in accordance with the inputted rotation number, and the solidifying material supply amount calculated by the rotation speed of the determinate quantity supply mechanism 23.

[0048] For example, the determinate quantity supply mechanism 23 has a structure which is provided with a feeder sectioned into grids and in which the solidifying material entering the grid is discharged from a discharge port by rotating the feeder and the solidifying material then drops down on the raw soil conveyer 7. It may be possible for the solidifying material to directly drop in the mixer 3.

[0049] It is preferred for the liquid supply device mentioned before to be equipped with a liquid supply amount detecting means. For example, as shown in Fig. 6, a flow meter 55 is provided for a discharge line 33 to detect the supply amount or rate. Instead of the location of such flow meter 55, it may be possible to provide a structure in which the rotation number of the liquid pump 31 is detected and the liquid supply amount is calculated by the controller 52 in accordance with the thus detected rotation number and a capacity (discharge amount per one rotation) of the liquid pump 31. Moreover, in the use of a mechanism in which the rotation number of the liquid pump 31 can be set according to the output from the controller 52, the detection of the rotation number may be made through the calculation of the output from the controller 52.

[0050] The mixed soil conveyer 10 is equipped, as a mixed soil conveying amount detecting means, as shown in Fig. 6, with a rotation detecting sensor 57 for detecting the rotation number of the driving wheel 24 rotated by a motor 56 and/or a load meter 58 for measuring a weight of the mixed soil on the mixed soil conveyer 10. The rotation number detected by the rotation detecting sensor 57 and/or the weight of the mixed soil measured by the load meter 58 is inputted into the controller 52, which then calculates the amount of the mixed soil to be conveyed in accordance with the inputted rotation number and/or weight of the mixed soil.

[0051] The mixing ratio of the raw soil and the solidifying material is also inputted to the controller 52 through a first setting element 59-1, which operates to optionally set the mixing ratio.

[0052] Furthermore, a water supply ratio with respect to the raw soil is inputted to the controller 52 through a second setting element 59-2 to optionally set the water supply ratio, and a full (total) supply amount of the mixed soil is also inputted into the controller 52 through a third setting element 59-3.

[0053] When signals from a mixed soil conveyer switch 60-1 and a mixer switch 60-2 are inputted to the controller 52, the controller 52 drives the motor 56 of the mixed soil conveyer 10, a motor 61 of the soil cutter device 15 of the mixer 3 and a motor 62 of the impact hammer device 16. Thereafter, when a signal is also inputted from a raw soil conveyer switch 60-3 to the controller 52, the controller 52 drives the motor 50 and a motor 63 of the scraping rotor 21.

[0054] When the signal from the raw soil sensor 7a is inputted into the controller 52, the controller drives the motor 53 to thereby rotate the determinate quantity supply mechanism 23 and hence to supply the solidifying material on the raw soil. The solidifying material may be directly supplied to the mixer 3.

[0055] Thereafter, when a first predetermined time elapses (i.e. when the discharge of the mixed soil starts), the motor 31 is driven to thereby discharge the water.

[0056] During the operations mentioned above, the controller 52 controls the rotation number of the motor 53 in accordance with the mixing ratio of the raw soil supply amount and the solidifying material supply amount and then controls the rotation number of the determinate

quantity supply mechanism 23.

[0057] According to such operations, the mixing ratio of the raw soil and the solidifying material can be set to a set value.

[0058] The controller 52 also operates to stop the operation of the motors other than the motor 31 at a time when the detected mixed soil conveying amount reaches the set mixed soil supply amount and to stop the operation of the motor 31 at a time when the water supply amount reaches the set ratio of the supply amount.

[0059] According to such operation, the mixed soil, the water and the solidifying material can be supplied to the mixing device 41 by the full (total) supply amount thereof.

[0060] A recording device 64 is connected to the controller 52.

[0061] This recording device 64 is equipped with an API (application program interface) monitor 65, a printer 66 and a DC-DC converter 67, and after the raw soil conveyer switch 60-3 is operated, when the respective supply amounts reach the set amounts and the respective motors are stopped in their operations, the API monitor 65 displays the raw soil supply amount, the solidifying material supply amount and the water supply amount together with the year, month, date and time and the displayed data is then printed out by the printer 66.

[0062] A second preferred example of the control unit or system (controller) for controlling the supply amounts of the respective materials will be then described hereunder.

[0063] With reference to Fig. 7, a raw soil supply amount set means 70, a solidifying material supply amount set means 71 and a water supply amount set means 72 are arranged, and these means may be preferably composed of dials, respectively.

[0064] The required full raw soil amount, full solidifying material amount and full water amount are inputted to the controller 52 by the respective amount set means.

[0065] A start signal is inputted into the controller 52 by operating a starting switch 60.

[0066] The controller 52 drives the respective motors, and when the detected raw soil supply amount reaches the set full raw soil amount, the motor 50 is stopped to thereby stop the operation of the raw soil conveyer 7. When the detected solidifying material supply amount reaches the set full solidifying material amount, the motor 53 is stopped to thereby stop the operation of the determinate quantity supply mechanism 23. Furthermore, when the detected water amount reaches the set full water amount, the motor 30 is stopped to thereby stop the operation of the liquid pump 31.

[0067] Thereafter, after a predetermined time elapses, the operations of the remaining motors are stopped.

[0068] In this case, it is not necessary to dispose the mixed soil conveying amount detecting means.

[0069] The mixed soil conveyer 10 may be disposed to be vertically swingable. For example, as shown in Fig. 8, the mixed soil conveyer 10 will be connected, at a portion near its longitudinal one end portion, to the machine body 1 to be vertically swingable through a shaft 80.

[0070] In such example, a bracket 81 is fixed to the portion near the longitudinal one end portion of the conveyer 10 and a support bracket 82 is also fixed to the machine body 1. The bracket 81 is formed with a vertical slot 83 through which a bolt 84 is inserted and the bolt 84 is screwed and fastened to the support bracket 82. The slot 83 has an arcuate shape with the shaft 80 being the center thereof.

[0071] According to this structure, the mixed soil conveyer 10 is vertically swingable about the shaft 80, so that the height of the discharge port thereof above the ground can be adjusted in accordance with the maximum ground height of the mixing device 41 of the mixer truck 40. A hydraulic cylinder means may be disposed so as to swing the mixed soil conveyer 10 vertically,

[0072] In the examples of the controllers 52 mentioned above, although the operations of the soil cutter device 15 and the impact hammer device 16 of the mixer 3 and the mixed soil conveyer 10 are stopped, too, at the time when the respective supply amounts reach their full amounts, it may be possible to stop the operations of only the raw soil conveyer 7, the solidifying material supply device 9 and the liquid supply device.

[0073] As shown in Fig. 9, the liquid tank 12 may be installed independently from the machine body 1.

[0074] Furthermore, as shown in Fig. 10, the mixing device 41 may be fastened to a base 42 as stationary type device. In such case, the mixing device 41 and the base 42 connected through a wire 43 and are lifted up by means of crane. The lifted mixing device 41 and the base 42 are then installed at a portion near a groove 44, and a lot of the fluidized soil is continuously produced and supplied to the groove 44 to thereby backfill a pipe 45. In this case, the mixing device 41 and the base 42 will be transferred by a truck after lifted and loaded on the truck by the crane, thus being easily handled as a unit or system.

[0075] Further, it is to be noted that the present invention is described herein to be applicable to a fluidized soil material supply machine, but the present invention is not limited to the described embodiments and many other changes, modifications and additions may be made without departing from the scopes of the appended claims.

Claims

1. A fluidized soil material supply machine comprising:

a machine body (1) provided with a traveling member (2);

a raw soil hopper (8) which is mounted to the machine body (1) and in which a raw soil is supplied;

a raw soil conveyer (7) mounted to the machine body (1) and adapted to convey the raw soil from the raw soil hopper (7);

a solidifying material supply device (9) mounted to the machine body (1) and adapted to supply a solidifying material;
a first mixer (3) mounted to the machine body (1) and adapted to mix the raw soil fed through the raw soil conveyer (7) and the solidifying material supplied from the solidifying material supply device (9) to thereby produce a mixed soil;
a mixed soil conveyer (10) for conveying a mixed soil produced in said first mixer (3); and
a liquid supply unit for supplying a liquid to be mixed with the raw soil and the solidifying material; and wherein
the mixed soil conveyed through the mixed soil conveyer (10) and the liquid supplied through the liquid supply unit are mixed in a second mixing device (41) operatively connected to the mixed soil conveyer.

2. A fluidized soil material supply machine according to claim 1, wherein said liquid supply unit is provided with a liquid supply port disposed to a discharge port of the mixed soil conveyer (10).

3. A fluidized soil material supply machine according to claim 1, wherein said liquid supply unit includes a liquid tank (12) which is disposed independently from the machine body (1).

4. A fluidized soil material supply machine according to any one of claims 1 to 3, further comprising:

a raw soil supply amount detection means;
a solidifying material supply amount detection means;
a liquid supply amount detection means;
a controller (52) operatively connected to said raw soil supply amount detection means, said solidifying material supply amount detection means and said liquid supply amount detection means and adapted to set required full raw soil amount, required full solidifying material amount and required full liquid amount and to stop operations of the raw soil conveyer (7), the solidifying material supply device (9) and the liquid supply device at a time when the respective supply amounts reach the set full amounts.

5. A fluidized soil material supply machine according to claim 4, wherein a recording device (64) is disposed to the controller for recording the respective supply amounts inputted in the controller (52) at the time when the operations of the raw soil conveyer (7), the solidifying material supply device (9) and the liquid supply device are stopped.

Patentansprüche

1. Maschine zum Zuführen von verflüssigtem Erdmaterial, die Folgendes umfasst:

einen mit einem Fahrglied (2) versehenen Maschinenaufbau (1);
einen Roherdetrichter (8), der am Maschinenaufbau (1) angebracht ist und in dem Roherde zugeführt wird;
einen Roherdenförderer (7), der am Maschinenaufbau (1) angebracht ist und dazu ausgeführt ist, die Roherde von dem Roherdetrichter (7) zu befördern;
eine Verfestigungsmaterialzuführvorrichtung (9), die am Maschinenaufbau (1) angebracht ist und dazu ausgeführt ist, ein Verfestigungsmaterial zuzuführen;
einen ersten Mischer (3), der am Maschinenaufbau (1) angebracht ist und dazu ausgeführt ist, die durch den Roherdenförderer (7) beförderte Roherde und das von der Verfestigungsmaterialzuführvorrichtung (9) zugeführte Verfestigungsmaterial zu vermischen, um **dadurch** ein Erdgemisch herzustellen;
einen Erdgemischförderer (10) zur Beförderung eines in dem ersten Mischer (3) hergestellten Erdgemischs; und
eine Flüssigkeitszuführeinheit zur Zuführung einer mit der Roherde und dem Verfestigungsmaterial zu vermischenden Flüssigkeit; und wobei das durch den Erdgemischförderer (10) beförderte Erdgemisch und die durch die Flüssigkeitszuführeinheit zugeführte Flüssigkeit in einer zweiten Mischvorrichtung (41), die mit dem Erdgemischförderer wirkverbunden ist, vermischt werden.

2. Maschine zum Zuführen von verflüssigtem Erdmaterial nach Anspruch 1, bei der die Flüssigkeitszuführeinheit mit einer Flüssigkeitszuführöffnung versehen ist, die an einer Abführöffnung des Erdgemischförderers (10) angeordnet ist.

3. Maschine zum Zuführen von verflüssigtem Erdmaterial nach Anspruch 1, bei der die Flüssigkeitszuführeinheit eine Flüssigkeitsbehälter (12) enthält, der unabhängig von dem Maschinenaufbau (1) angeordnet ist.

4. Maschine zum Zuführen von verflüssigtem Erdmaterial nach einem der Ansprüche 1 bis 3, weiterhin mit:

einem Roherdezuführungsmengenerfassungsmittel;
einem Verfestigungsmaterialzuführungsmengenerfassungsmittel;

einem Flüssigkeitszuführungsmengenerfassungsmittel;
einer mit dem Rohrerdenzuführungsmengenerfassungsmittel, dem Verfestigungszuführungsmengenerfassungsmittel und dem Flüssigkeitszuführungsmengenerfassungsmittel wirkverbundene Steuerung (52), die dazu ausgeführt ist, eine erforderliche Roherdengesamtmenge, eine erforderliche Verfestigungsmaterialgesamtmenge und eine erforderliche Flüssigkeitsgesamtmenge einzustellen und den Betrieb des Rohrerdenförderers (7), der Verfestigungsmaterialzuführvorrichtung (9) und der Flüssigkeitszuführvorrichtung dann anzuhalten, wenn die jeweiligen Zuführmengen die eingestellte Gesamtmenge erreichen.

5. Maschine zum Zuführen von verflüssigtem Erdmaterial nach Anspruch 4, bei dem eine Aufzeichnungsvorrichtung (64) an der Steuerung angeordnet ist, um die jeweiligen Zuführungsmengen, die in die Steuerung (52) eingegeben werden, zu dem Zeitpunkt aufzuzeichnen, zu dem der Betrieb des Roherdenförderers (7), der Verfestigungsmaterialzuführvorrichtüng (9) und der Flüssigkeitszuführvorrichtung angehalten ist.

Revendications

1. Machine de distribution de matériaux terreux fluidisés comprenant :

un bâti de la machine (1) doté d'une unité motrice (2) ;
une trémie à terre brute (8) qui est montée sur le bâti de la machine (1) et dans laquelle la terre brute est alimentée ;
un transporteur de terre brute (7) monté sur le bâti de la machine (1) et adapté pour transporter la terre brute de la trémie à terre brute (7) ;
un dispositif d'alimentation de matériau de solidification (9) monté sur le bâti de la machine (1) et adapté pour alimenter un matériau de solidification ;
une première mélangeuse (3) montée sur le bâti de la machine (1) et adaptée pour mélanger la terre brute alimentée par le transporteur de terre brute (7) et le matériau de solidification alimenté par le dispositif d'alimentation de matériau de solidification (9) pour produire de la sorte un matériau terreux mélangé ; et
un transporteur de matériau terreux mélangé (10) pour transporter un matériau terreux mélangé produit dans ladite première mélangeuse (3) ; et
une unité d'alimentation de liquide pour alimenter un liquide destiné à être mélangé avec la terre brute et le matériau de solidification ; et dans laquelle
le matériau terreux mélangé transporté par le transporteur de matériau terreux mélangé (10) et le liquide alimenté par l'unité d'alimentation de liquide sont mélangés dans une deuxième mélangeuse (41) connectée en fonctionnement au transporteur de matériau terreux mélangé.

2. Machine de distribution de matériaux terreux fluidisés selon la revendication 1, dans laquelle ladite unité d'alimentation de liquide et pourvue d'un orifice d'alimentation de liquide disposé au niveau d'un orifice de déchargement du transporteur de matériau terreux mélangé (10).

3. Machine de distribution de matériaux terreux fluidisés selon la revendication 1, dans laquelle ladite unité d'alimentation de liquide comprend un réservoir à liquide (12) qui est disposé indépendamment du bâti de la machine (1).

4. Machine de distribution de matériaux terreux fluidisés selon l'une quelconque des revendications 1 à 3, comprenant en outre :

un moyen de détection de la quantité de terre brute alimentée ;
un moyen de détection de la quantité de matériau de solidification alimentée ;
un moyen de détection de la quantité de liquide alimentée ;
un contrôleur (52) connecté en fonctionnement audit moyen de détection de la quantité de terre brute alimentée, audit moyen de détection de la quantité de matériaux de solidification alimentée et audit moyen de détection de la quantité de liquide alimentée et qui est adapté pour régler la quantité totale de terre brute requise, la quantité totale de matériau de solidification requise et la quantité totale de liquide requise et pour arrêter le fonctionnement du transporteur de terre brute (7), du dispositif d'alimentation de matériau de solidification (9) et du dispositif d'alimentation de liquide au moment où les quantités alimentées respectives atteignent les quantités totales prédéterminées.

5. Machine de distribution de matériaux terreux fluidisés selon la revendication 4, dans laquelle un dispositif d'enregistrement (64) est disposé au niveau du contrôleur pour enregistrer les quantités alimentées respectives saisies dans le contrôleur (52) au moment où les fonctionnements du transporteur de terre brute (7), du dispositif d'alimentation de matériau de solidification (9) et du dispositif d'alimentation de liquide sont arrêtés.

FIG. 1

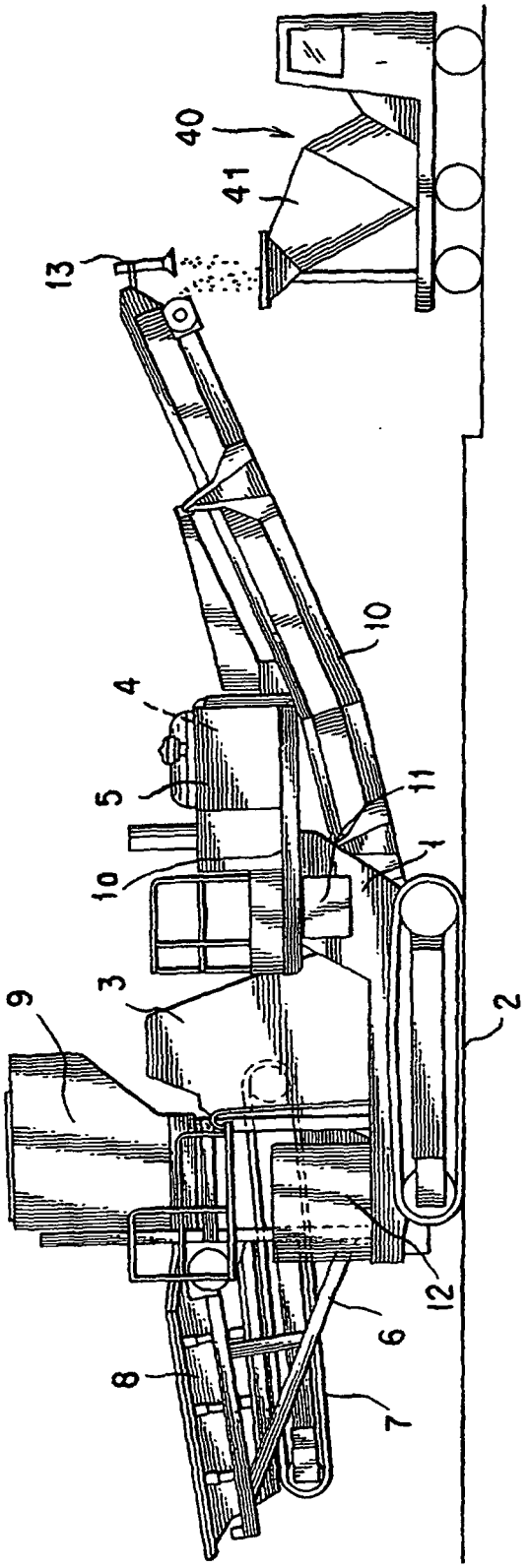


FIG. 2

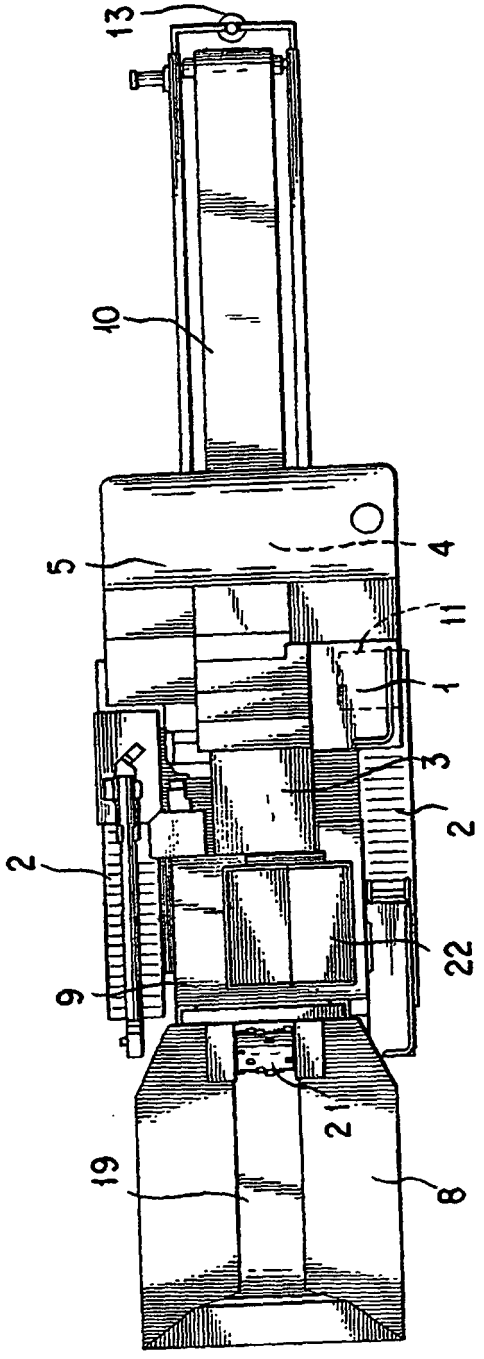


FIG. 3

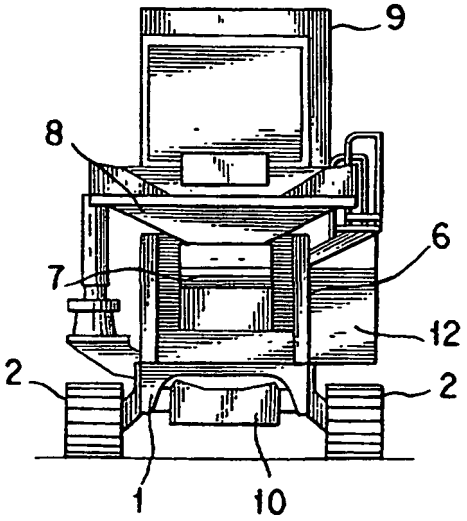
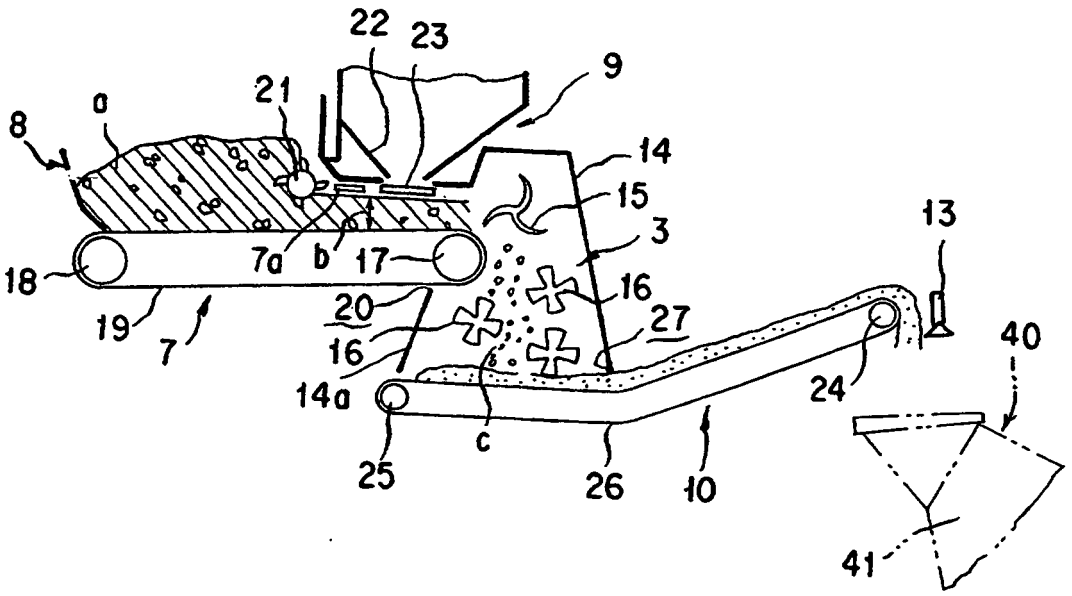


FIG. 4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a
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7a
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16
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14a
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41

FIG. 5

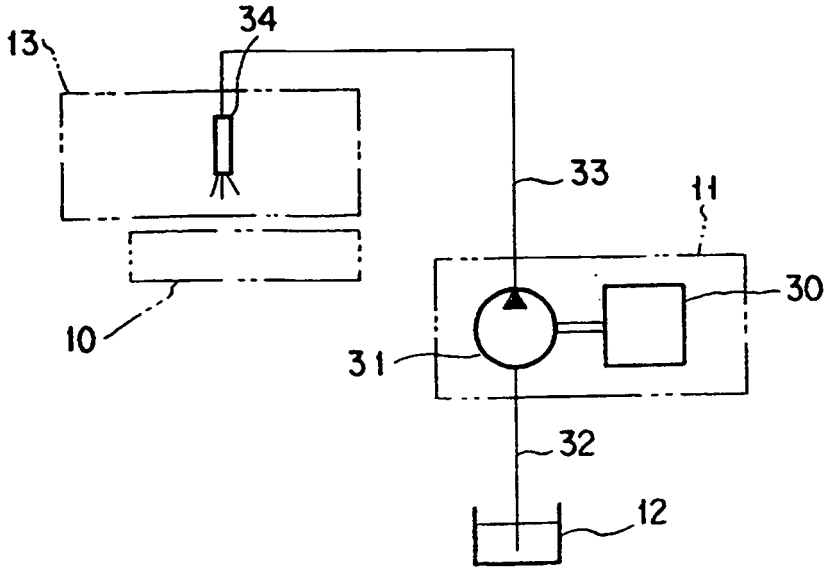
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FIG. 6

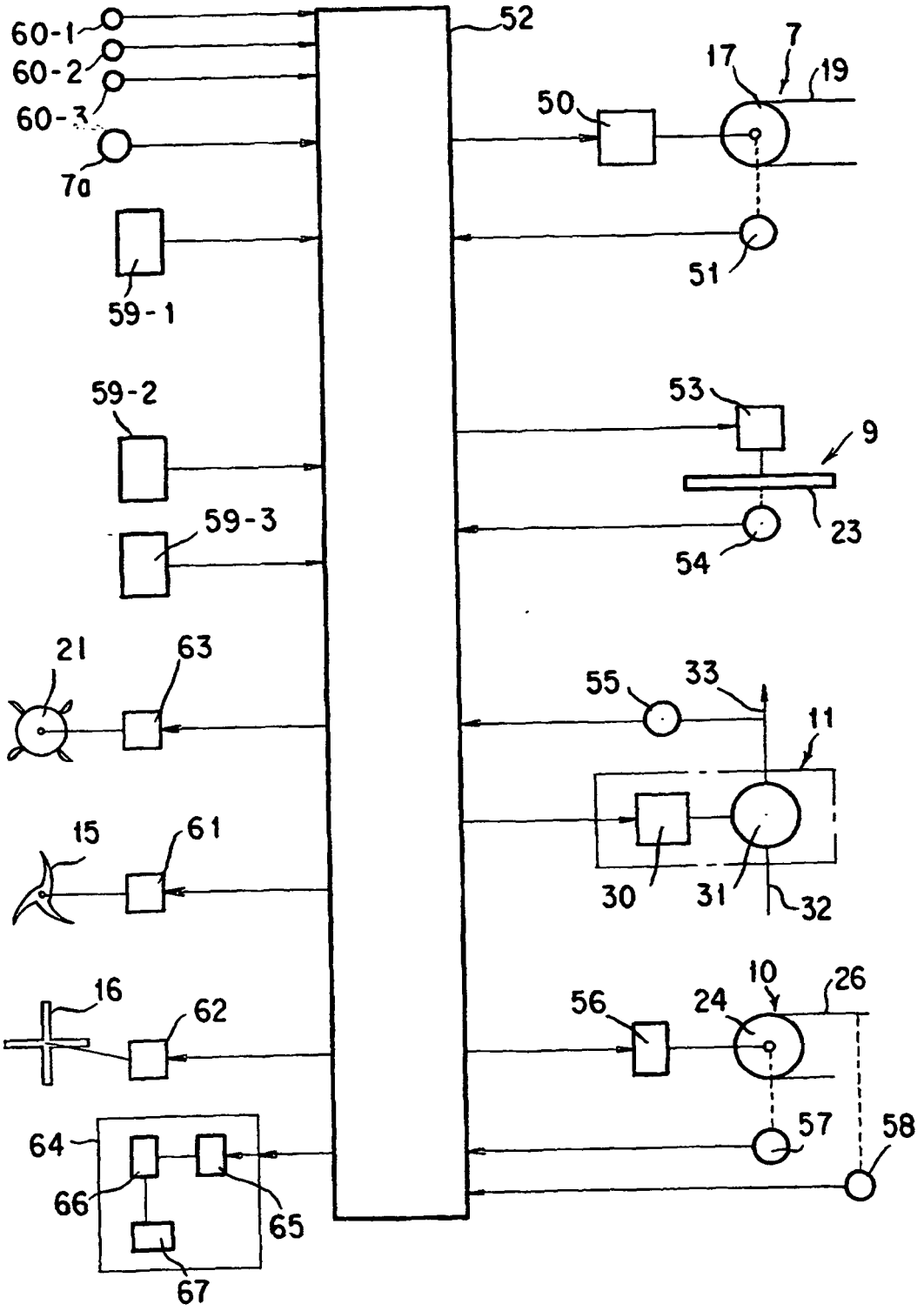
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FIG. 7

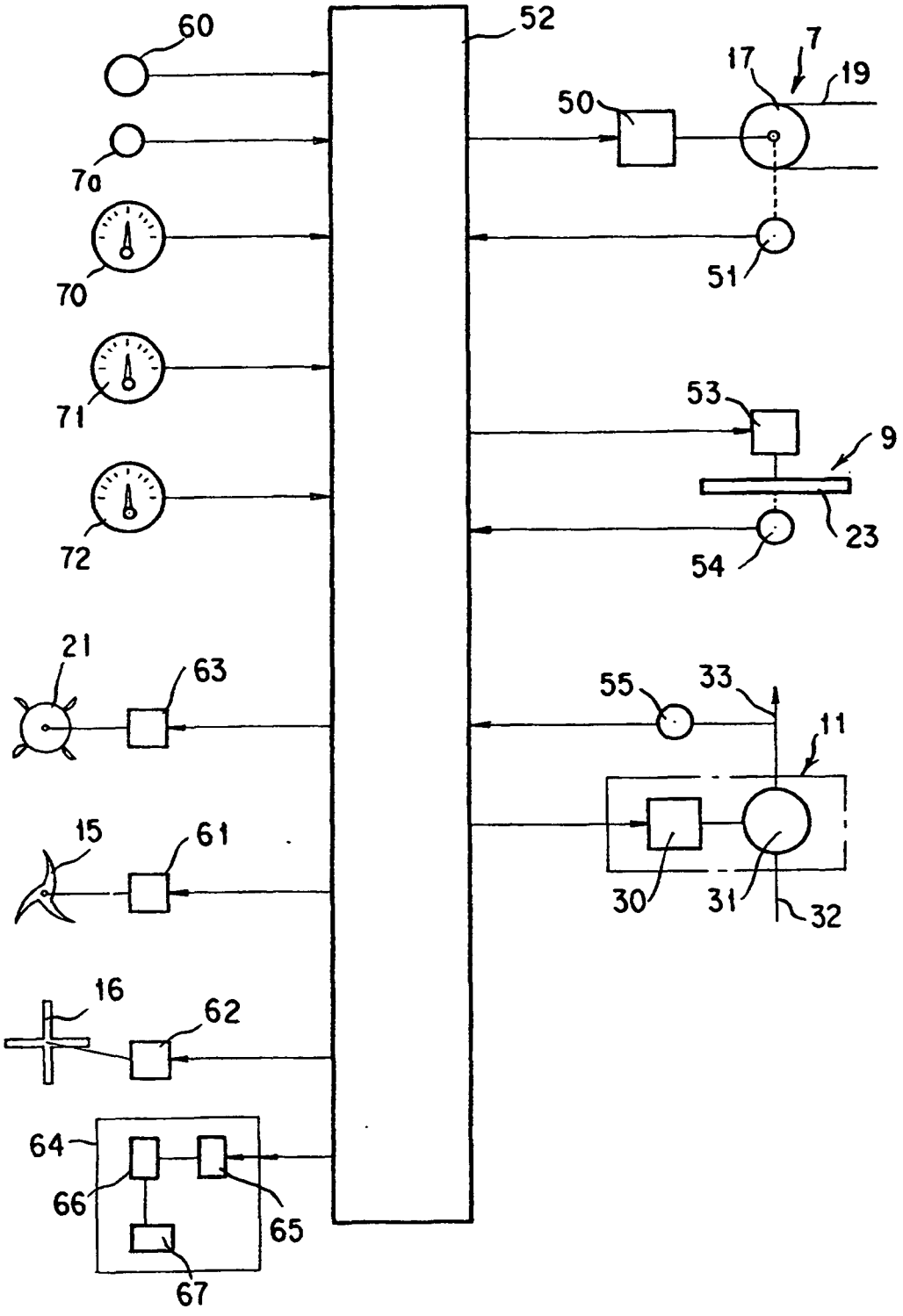
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FIG. 8

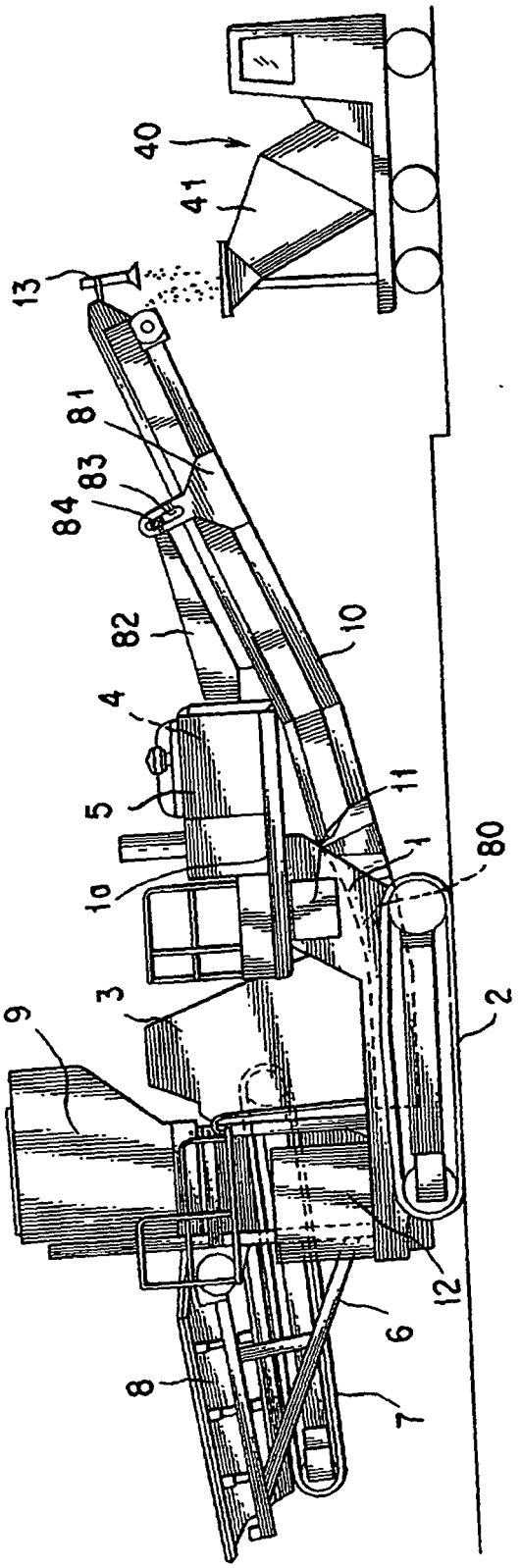

FIG. 9

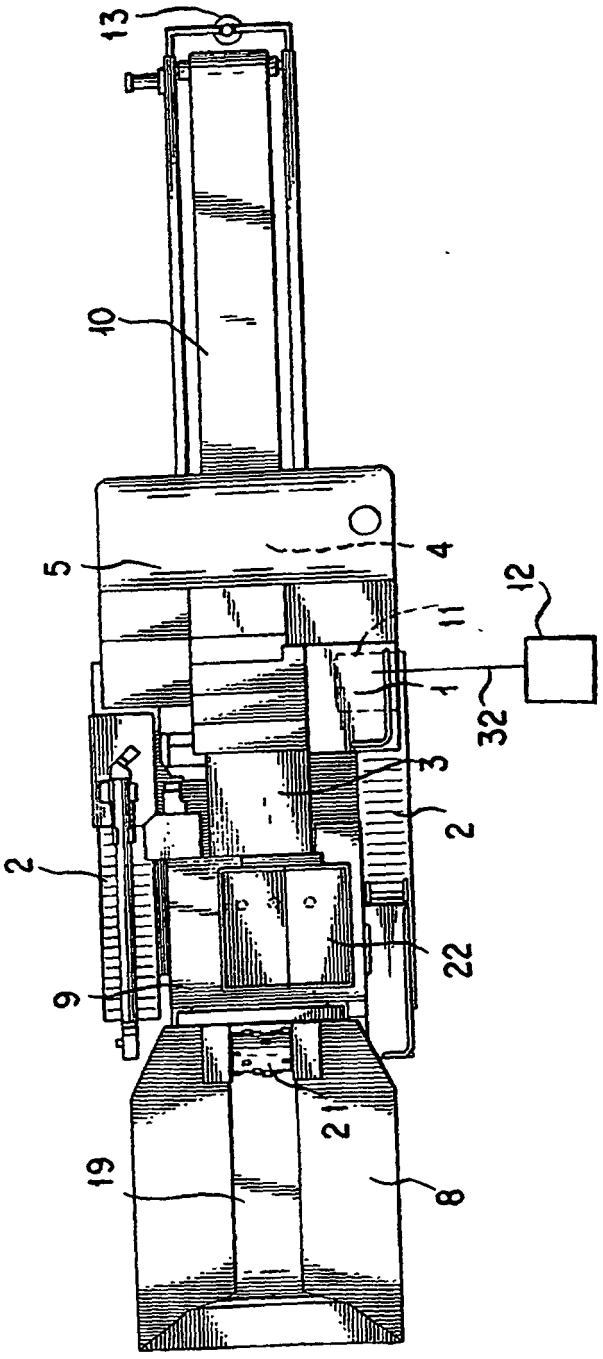

FIG. 10