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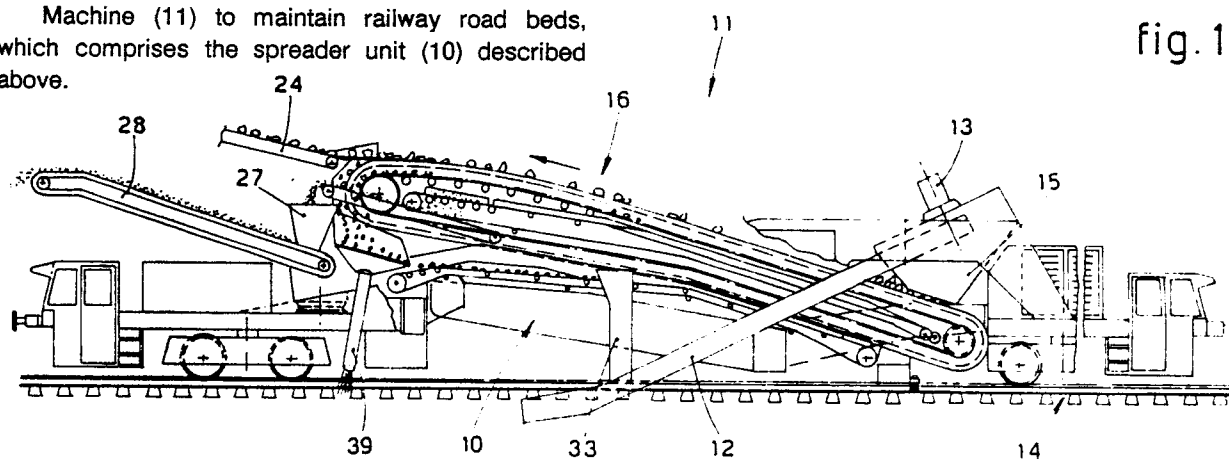
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54 **Metalling spreader unit in a machine to maintain railway road beds, and machine which employs such spreader unit.**

57 Metalling spreader unit (10) in a machine (11) to maintain railway road beds, the unit cooperating with a riddle (16) and comprising one single conveyor belt (31) which extends lengthwise below the riddle, has the task of receiving and spreading the middlings (21) and includes at least one sideways discharge zone (231) and one terminal discharge zone (331).

Machine (11) to maintain railway road beds, which comprises the spreader unit (10) described above.

EP 0 227 142 A1



"METALLING SPREADER UNIT IN A MACHINE TO MAINTAIN RAILWAY ROAD BEDS, AND MACHINE WHICH EMPLOYS SUCH SPREADER UNIT"

This invention concerns a metalling spreader unit in a machine to maintain railway road beds.

To be more exact, the spreader unit of this invention is a part of a machine to maintain railway road beds which takes metalling from beneath the railway line, riddles such metalling and spreads the recovered middlings without any debris on the road bed once more.

The invention concerns also a machine which employs such spreader unit.

The device of the invention is suitable to cooperate with a riddle which is preferably of a continuous type including a riddling conveyor or chain.

Various machines to maintain railway road beds are known in the art which are equipped with a riddle and with means to spread the middlings recovered.

For instance, patent CH 309855 (MATISA) is known and discloses a maintenance machine equipped with a bladed scraper chain able to scrape the metalling from beneath the railway line. The metalling is delivered on a conveyor to a vibratory riddle. The recovered middlings leaving the riddle fall onto a spreader consisting of a system of chutes with deviators. Such spreader can deliver the metalling directly onto the line or onto a revolvable conveyor for spreading at the rear of the machine.

FR 2.305.544 (MATISA) discloses a maintenance machine equipped with a bladed chain able to scrape the metalling from beneath the railway line, with a vibratory riddle able to separate the recovered middlings from the debris and with a conveyor which is positioned at the end of the riddle and delivers the recovered middlings to a distributor box. Such distributor box consists substantially of a box-shaped bogie and has on its lower side a system of movable deviators that enables the metalling to be spread as required between or outside the rails.

Patent FR 2.413.501 (PLASSER) is also known and discloses a maintenance machine which too is equipped with a scraper chain and vibratory riddle. The recovered middlings leave the end of the vibratory riddle and can be caused to drop by a spreader with a movable blade directly onto the road bed immediately below the outlet of the riddle or onto a pair of conveyors, one on each side of the machine. These conveyors deliver the recovered middlings to the forward zone of the machine and deposit them substantially onto the outer sides

of the road bed, whereas the portion of the middlings allowed to fall freely from the riddle covers substantially the whole crosswise extent of the road bed.

The known art, therefore, either separates the tasks of conveying and spreading the recovered middlings, as in the case of FR 2.305.544 cited above, or requires a plurality of conveyors to spread the middlings, as in FR 2.413.501. These systems entail a plurality of actuation means and a complicated construction.

FR 2.305.544 in particular requires the cited spreader box, which is a very heavy device and, being alongside the rails, raises problems when it has to be moved from one area to another, or has to be disconnected when being so moved.

This invention purposes to provide a metalling spreader unit which carries out the task of receiving the recovered middlings from a riddle and of spreading such middlings on railway road beds.

The invention provides for the employment of one single conveyor for this purpose in cooperation with a simple spreader.

The invention provides in particular a spreader of this type arranged in cooperation with, and substantially along, the whole extent of a continuous conveyor riddle.

The spreader conveyor not only receives the recovered metalling at the end of the continuous riddle but also receives the metalling which is detached thereafter from the riddle during the lengthwise travel of the lower tract of the riddle, thus enabling the efficiency of recovery to be maximised.

The invention provides also for spreader means consisting of lateral funnels and rear chutes, such funnels and chutes being adjustable and also retractable so that they will remain within the permitted clearance gauge when being moved from one working area to another.

The invention also enables the actuation means to be simplified as only one conveyor is required; the installed power is also reduced and the spreading of the metalling can be adjusted in an excellent manner.

A preferred embodiment comprises a washer unit between the continuous riddle and the front portion of the spreader conveyor. In this embodiment the greater part of the recovered metalling is discharged at the rear end of the continuous riddle and is delivered to a collection hopper or chute in which a set of sprayer nozzles cooperates.

The bottom of the hopper is able to retain the metalling and to let through the mud which is provided by removal of the dust and fine debris covering the metalling. Such mud is collected by a funnel and discharged sideways from the machine.

The metalling thus washed slides to the bottom (consisting, for instance, of a metallic mesh or perforated metallic sheet) of the hopper or chute and is collected by the spreader conveyor.

In this way an extra operation is performed to clean the recovered metalling, which is thus not only sorted for piece size but is also washed. This extra operation is included in the working cycle of the maintenance machine.

This invention is therefore embodied with a metalling spreader unit in a machine to maintain railway road beds, the spreader unit cooperating with a riddle and being characterized in that it comprises one single belt conveyor extending lengthwise below the riddle and having the tasks of receiving and spreading recovered metalling, such conveyor comprising at least one lateral discharge zone and one terminal discharge zone.

The invention is embodied also with a machine to maintain railway road beds, the machine being characterized in that it comprises a spreader unit thus constituted.

We shall describe hereinafter a preferred embodiment of the invention as a non-restrictive example with the help of the attached figures, in which:-

Fig.1 is a diagrammatic view of the assemblage of a maintenance machine to which the invention is applied;

Fig.2 is a diagrammatic side view of the spreader unit of the invention in cooperation with the continuous riddle;

Fig.3 is a plan view of the spreader conveyor of the invention, the continuous riddle having been left out;

Fig.4 is a section along A-A of Fig. 2;

Fig.5 is a section along B-B of Fig.2;

Fig.6 is a diagrammatic and partly cutaway front view of Fig.2.

In Fig.1 a unit 10 to spread metalling according to the invention is fitted to a machine 11 to maintain railway road beds.

A scraper chain 12, which is known in itself and driven by a motor 13, scrapes metalling from beneath a railway line 14.

The metalling falls into a hopper 15, whence it is deposited on a continuous riddle 16. In this example the continuous riddle consists of a two-mesh conveyor 17-18, of which the upper mesh 17 retains the large fractions for discharge, whereas

the lower mesh retains the recovered metalling. The riddle 16 cooperates with a discharge conveyor belt 19 in the collection and discharge of fine debris.

In its turn the discharge conveyor belt 19 is contained within the two-mesh conveyor 17-18.

Fractions 20 of too great a piece size (see Fig.2) are diverted by a blade 23 onto a discharge conveyor 24, of which only the front portion is shown and which delivers such fractions 20 to a recovery station such as an appropriate waggon, which is not shown here.

Likewise, fine debris 22 passes through the two meshes 17-18 of the riddle and drops onto the discharge conveyor belt 19.

Two deviators 25 make the fine debris fall sideways onto two conveyors 26 (see also Fig.6), by which the debris is deposited through a hopper 27 onto a conveyor 28 that discharges debris.

Recovered metalling 21 having a piece size complying with the regulations is thrown by centrifugal force against a frontal wall 29 and thence sent to a spreader unit 10 by means of a frontal hopper or chute 30.

The spreader unit 10 comprises a spreader conveyor belt 31 which stretches substantially below and in the immediate neighbourhood of the continuous riddle 16.

Fig.3 shows in particular a plan view of the spreader conveyor belt 31, which is generally concave so as to retain the metalling, except for a loading portion 131 below the frontal hopper 30, an intermediate lateral discharge portion 231 and an end portion 331 for discharge in the centre of the road bed.

Such concave profile is widely employed in conveyor belts. Fig.5 shows also the rollers which support the spreader conveyor belt and their disposition.

At the intermediate portion 231 two movable blades 32 regulate the lateral discharge of metalling into two discharge funnels 33, which are shown in greater detail in Fig.4.

Such blades 32 can be adjusted so as to discharge a greater or smaller portion of the metalling carried on the spreader conveyor belt 31 into the funnels 33.

As can be seen in particular in Fig.4, each funnel 33 is equipped at its lower end with two discharge outlets 133 positioned astride a rail 34 to provide excellent spreading of the metalling.

The funnels 33 and movable blades 32 can slide vertically and be lifted by actuators, which are not shown here but can be of a pneumatic type for instance, so as to remain within the permitted clearance gauge for movement to another area.

By adjusting the blades 32 suitably it is possible to send more or less metalling into the funnels 33 and also to regulate the ratio between metalling discharged to the right or to the left of the road bed maintenance machine 11.

A deviator 35 is located in the rear terminal zone 331 of the machine and can be adjusted, crosswise to the spreader conveyor belt 31 as shown by the arrow of Fig.3, by suitable actuator means, which are not shown here.

Such deviator 35 diverts the metalling onto two lateral chutes 36, which can be raised in a diagonal direction according to the arrows of Fig.5 so as to regulate the depositing of the metalling and to make sure chutes remain within the clearance gauge laid down for movement from one area to another.

The combination of the positions taken up by the deviator 35 and chutes 36 makes it possible to regulate the quantity of metalling discharged towards the right or left of the machine respectively and between the rails or outside the rails 34. This system enables an excellent regulation to be obtained of the positioning of the recovered metalling 21 on the railway line.

Brushes 40 are fixed solidly to the rear of the chutes 36 to clean the rails and attachments. The chutes 36 and brushes 40 may be positioned preferably on a bogie running on the rails or be suspended on the frame of the machine.

In the preferred embodiment shown a unit 37 to wash the recovered metalling is included in cooperation with the frontal hopper 30 and in this example consists of pipes with a set of sprayer nozzles to deliver water.

In the case shown the frontal hopper 30 has a mesh bottom 130 onto which the recovered metalling 21 slides, whereas the debris and dust stuck to the metalling are removed by washing. The mud thus formed passes through the bottom 130 consisting of a mesh or perforated metal sheet and is collected within a funnel 38, whence it is discharged by a discharge conduit 39.

As can be seen in Fig.6, the discharge conduit 39 can be anchored to one or the other side of the discharge funnel 38, which includes a discharge outlet on each side of the machine; the outlet not in use for connection of the conduit 39 is closed with a cover.

The washing unit 37 need not be used when it is not desired that the recovered metalling 21 should be washed; in that case the metalling is only riddled and then re-spread by the spreader conveyor 31 on the road bed.

We have described here a preferred embodiment of the invention but variants are possible without departing thereby from the scope of the invention.

Thus, for instance, several lateral discharge stations may be provided at different positions along the machine.

5 The discharge funnels 33 and chutes 36 may be conformed or sloped in a different manner and vibrators may be provided in cooperation with the conveyors forming the riddle 16 or spreader unit 10;

10 These and other variants are all possible for a person skilled in this field without departing thereby from the scope of the invention.

Claims

15 1 -Metalling spreader unit (10) in a machine - (11) to maintain railway road beds, the spreader unit cooperating with a riddle (16) and being characterized in that it comprises one single conveyor belt (31) extending lengthwise below the riddle and having the task of receiving and spreading recovered metalling (21), such conveyor comprising at least one lateral discharge zone (231) and one terminal discharge zone (331).

25 2 -Metalling spreader unit (10) as claimed in Claim 1, which cooperates with a continuous conveyor (17-18) riddle (16).

30 3 -Metalling spreader unit (10) as claimed in Claim 1 or 2, which comprises a unit (37) to wash the recovered metalling (21) at a position between a discharge zone (30) of the riddle and an initial portion (131) of the spreader conveyor belt (31).

35 4 -Metalling spreader unit (10) as claimed in Claims 1 and 3, in which the washer unit (37) cooperates with a hopper (30) having a perforated bottom (130) and with a funnel (38-39) to discharge mud.

40 5 -Metalling spreader unit (10) as claimed in any claim hereinbefore, which comprises in its lateral discharge zone (231) two discharge funnels - (33) with adjustable deviator blades (32) cooperating with the upper surface of the spreader conveyor (31).

45 6 -Metalling spreader unit (10) as claimed in Claims 1 and 5, in which each of the discharge funnels (33) comprises a pair of discharge outlets - (133) positioned astride a rail (34) (Fig. 4).

50 7 -Metalling spreader unit (10) as claimed in any claim hereinbefore, in which the terminal discharge zone (331) comprises a deviator (35) capable of being adjusted crosswise to the spreader conveyor (31).

55 8 -Metalling spreader unit (10) as claimed in Claims 1 and 7, which comprises adjustable lateral chutes (36) cooperating with the deviator (35) and capable of being raised within the clearance gauge laid down for movement from one area to another.

9 -Metalling spreader unit (10) as claimed in Claims 1 and 8, in which the lateral chutes (36) comprise brushes (40) solidly fixed to such chutes so as to clean the rails (34), sleepers and attachments.

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10 -Machine (11) to maintain the railway road bed, which comprises a spreader unit (10) according to any of the claims hereinbefore.

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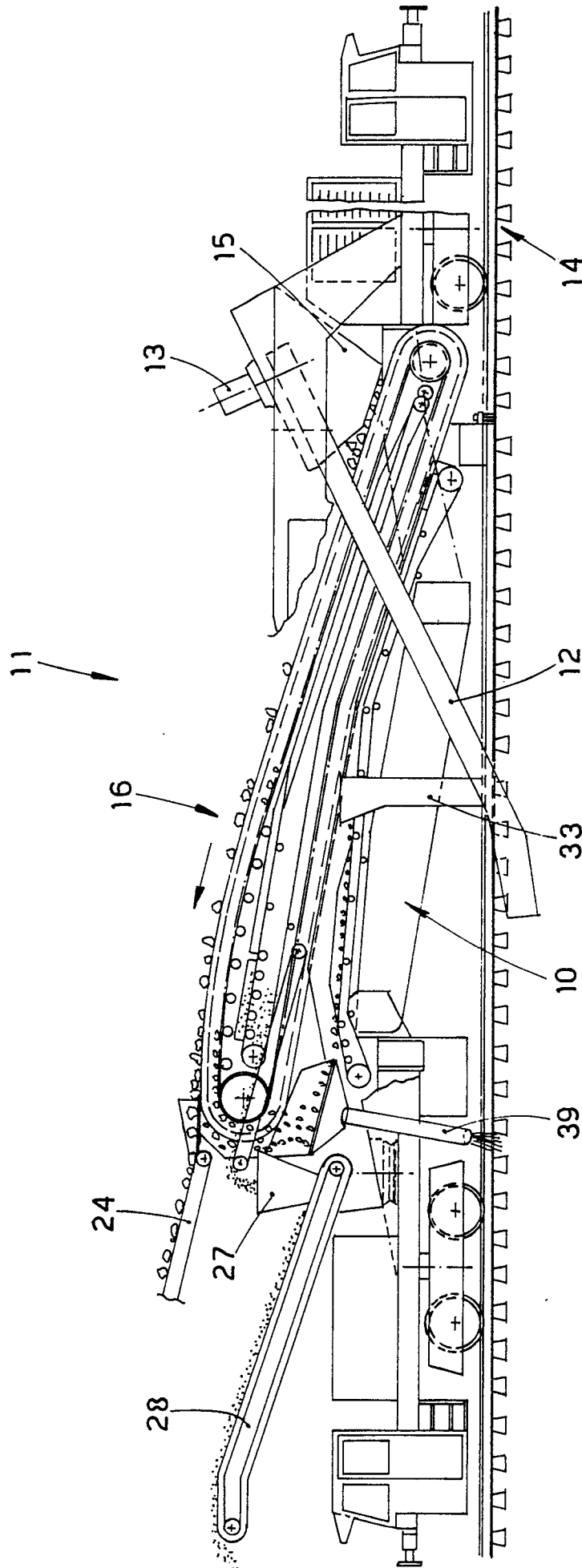


fig. 1

Flut

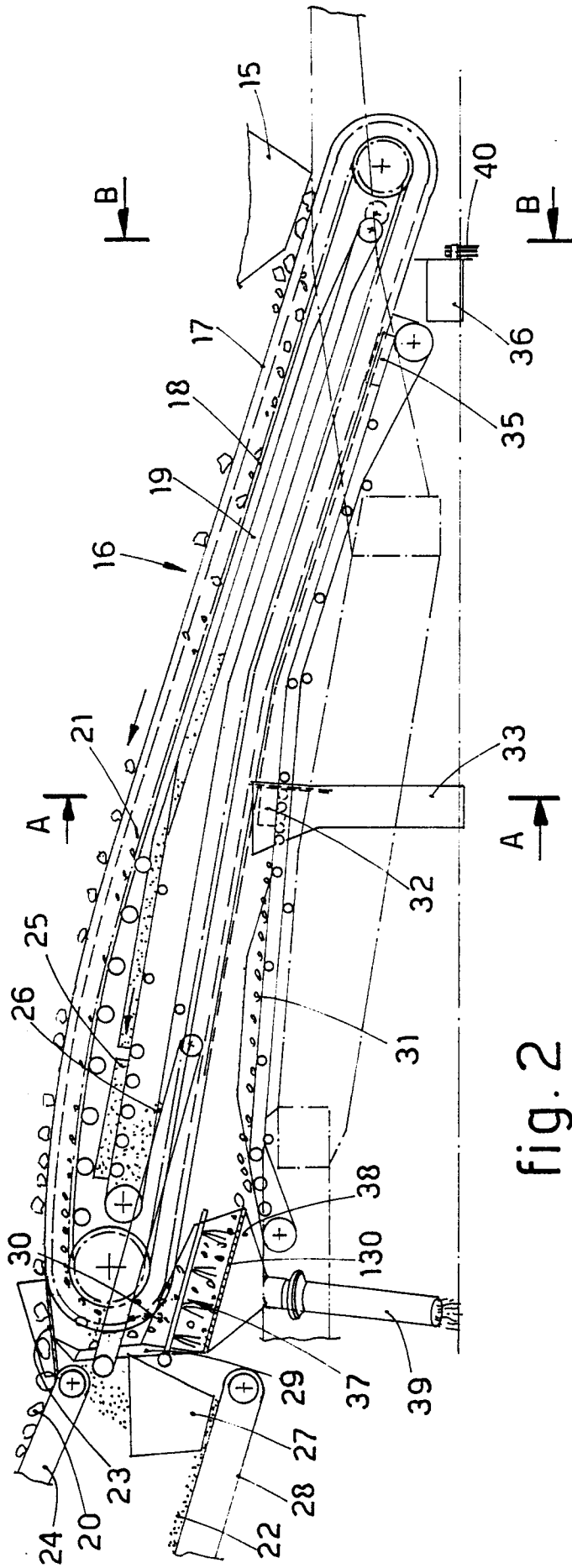


fig. 2

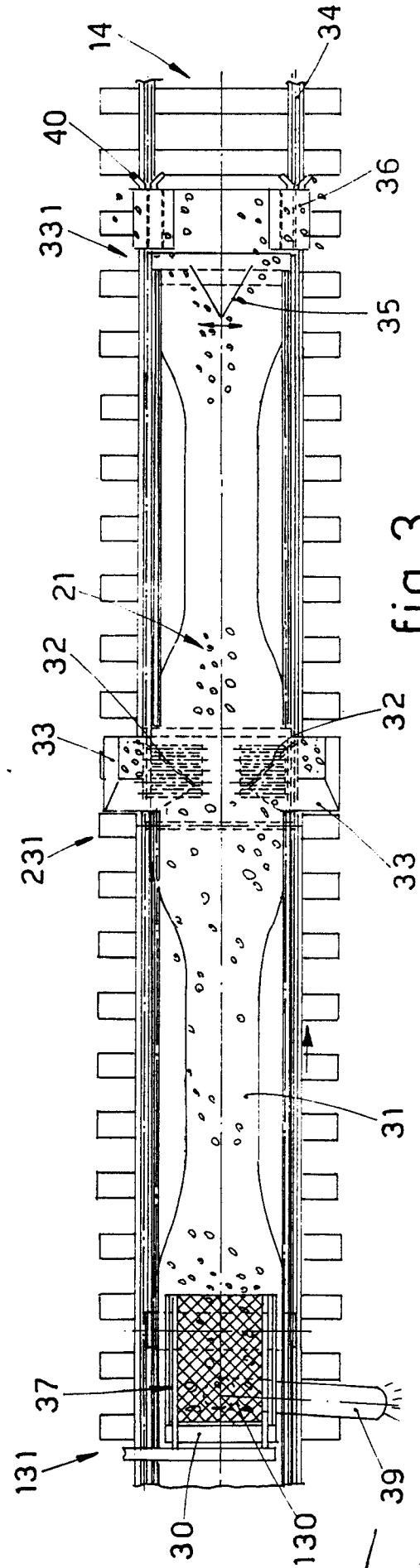


fig. 3

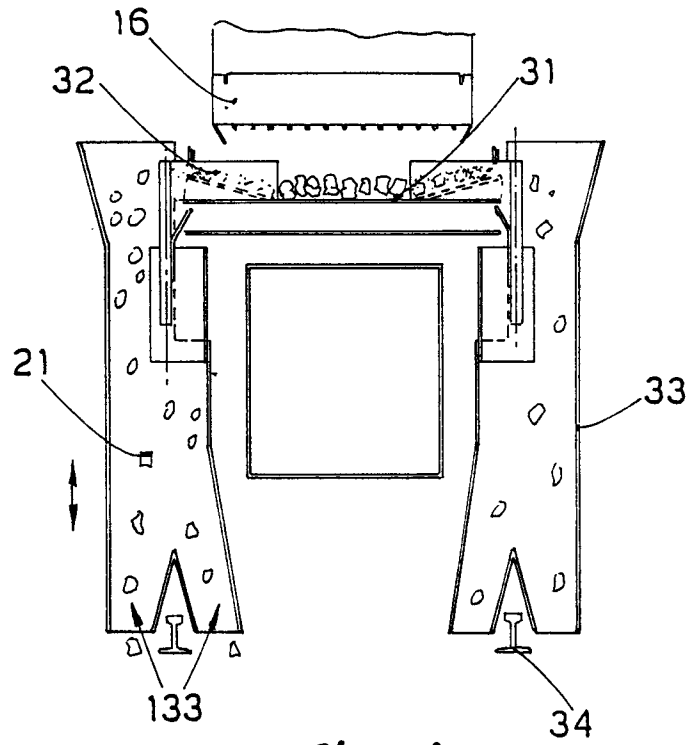


fig. 4

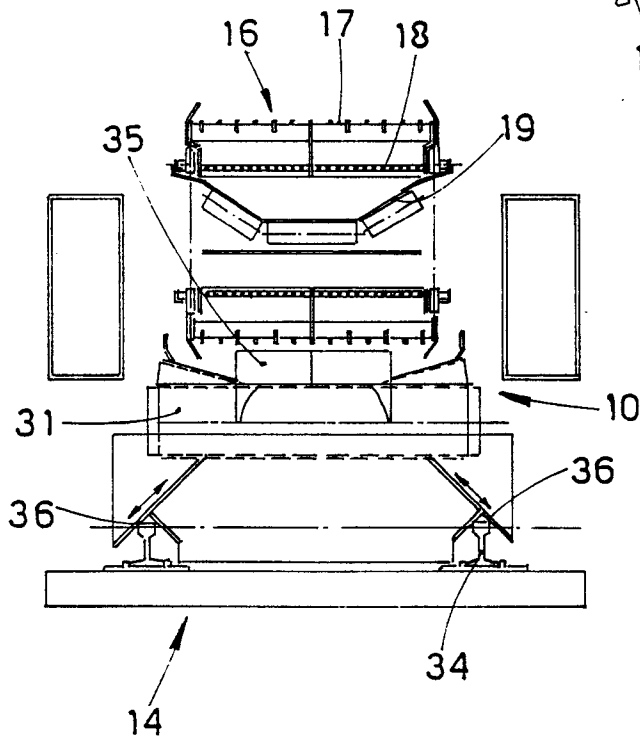


fig. 5

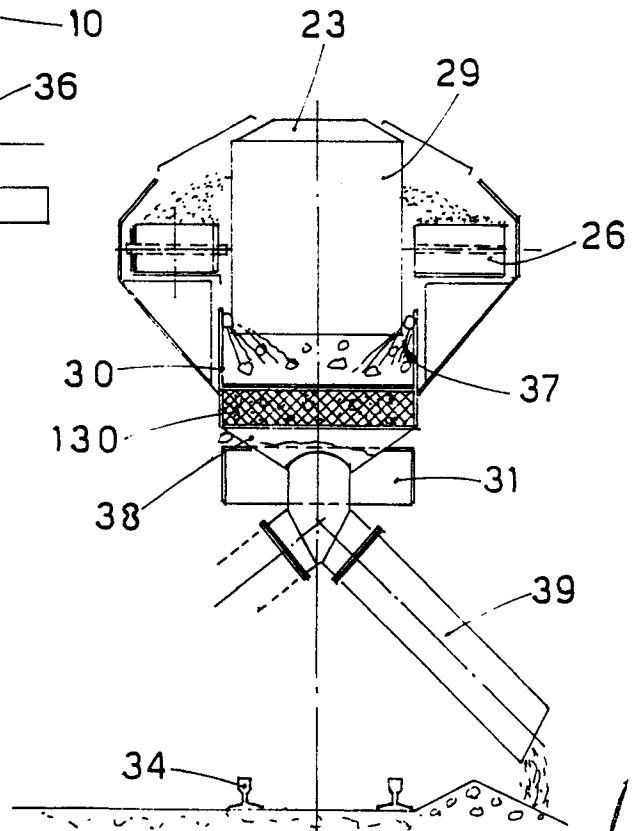


fig. 6

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	FR-A- 982 130 (S.E.C.O.) * Page 1, left-hand column, paragraphs 1,4; page 1, right-hand column, paragraphs 5-7; page 2, left-hand column, paragraphs 1,2,6; figures 1-6 *	1,7,8	E 01 B 27/02 E 01 B 27/06
A	--- GB-A-2 151 676 (PLASSER) * Page 3, lines 67-93; page 4, lines 27-43; figures 1,2 *	1,5	
A	--- FR-A- 714 645 (LEMAIRE) * Page 1, lines 15-26; page 3, lines 4-21, 62-68; figures 1-5 *	1,5,6	
A	--- FR-A-2 198 442 (SOCIETE LYONNAISE DE CONCASSAGE) * Page 4, lines 6-11; page 5, lines 32-40; page 6, lines 1-17; figures 1-5 *	1,7	TECHNICAL FIELDS SEARCHED (Int. Cl.4) E 01 B
A	--- GB-A-2 152 984 (PLASSER) * Page 3, lines 18-44; figures 1-4 *	4	

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23-01-1987	Examiner RUYMBEKE L.G.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	