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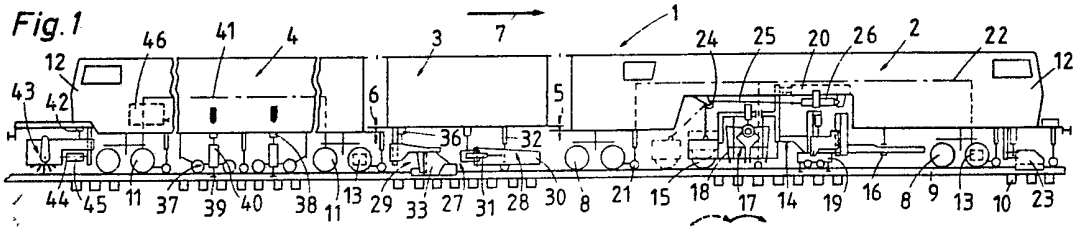
(54) A continuously advancing (non-stop) track maintenance machine

(57) A continuously advancing (non-stop) track maintenance machine (1) for tamping the ballast beneath the sleepers of a railway track, comprising a machine frame (2) supported by two undercarriages (8) spaced apart from one another and a tool carrier (14) connected to the machine frame and arranged between the two undercarriages (8) for a vertically displaceable lifting and lining unit (19) and a vertically displaceable tamping unit (17) comprising tamping tools (18) designed for movement relative to one another in pairs and for vibration under the power of squeezing and vibration drives and for penetration into the ballast. The tool carrier (14) is designed for longitudinal displacement relative to the machine frame (2) under the power of a drive (20) pivotally connected thereto. At its rear end (in the working direction), the machine (1) is pivotally connected or rather coupled to a second machine frame (3) which is supported by undercarriages (11, 8) spaced apart from one another and on which a plough arrangement (27) is mounted between the two undercarriages (11; 8), the plough arrangement being vertically displaceable under the power of a drive (36, 36) and comprising a centre plough (29) and shoulder ploughs (28) operable through drives (31).

Fig. 1



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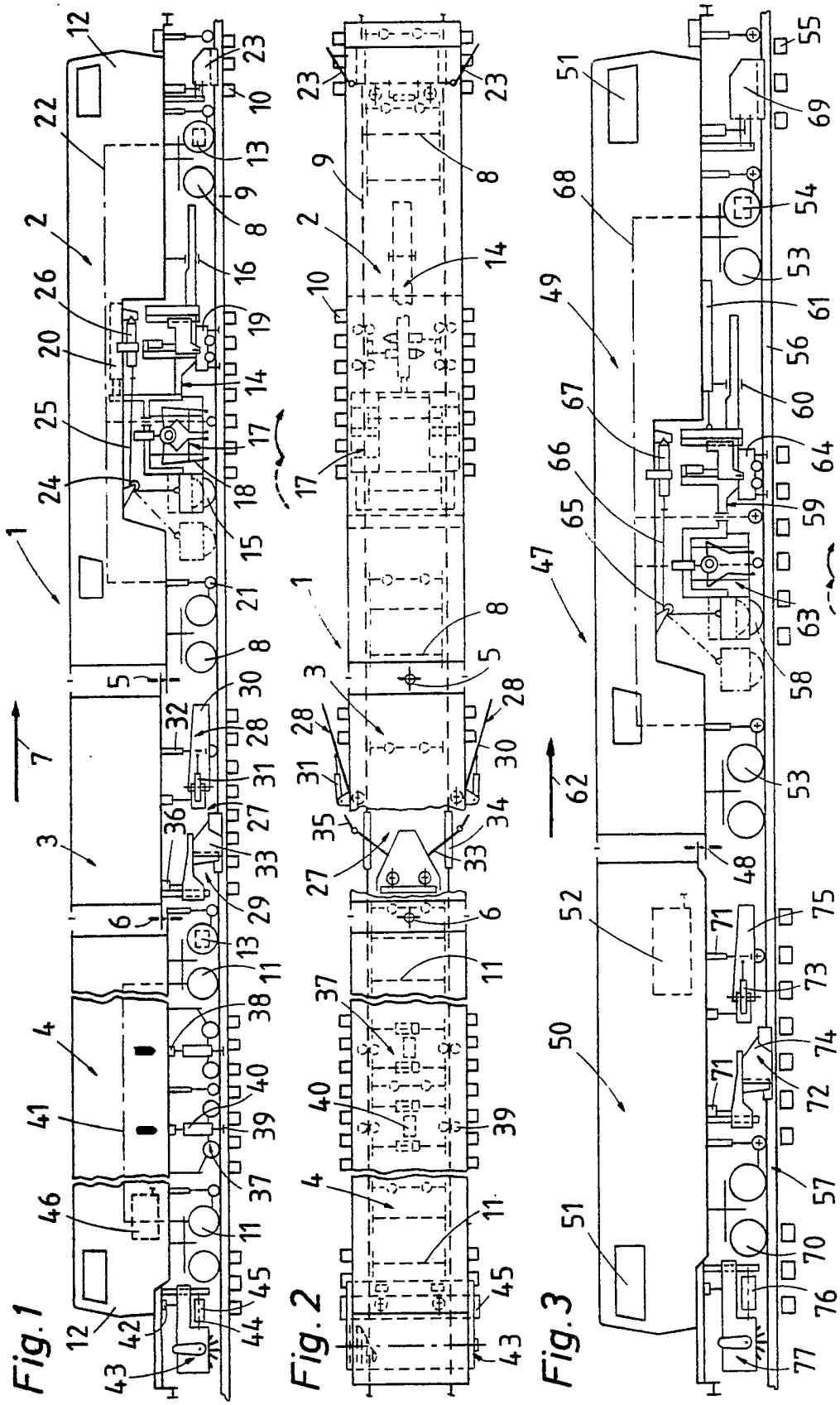

Fig. 1

Fig. 2

Fig. 3

A CONTINUOUSLY ADVANCING (NON-STOP) TRACK MAINTENANCE MACHINE

This invention relates to a continuously advancing (non-stop) track maintenance machine for tamping the ballast beneath the sleepers of a railway track, comprising a machine frame supported by two undercarriages spaced apart from one another and a tool carrier connected to the machine frame and arranged between the two undercarriages for a vertically displaceable lifting and lining unit and at least one vertically displaceable tamping unit comprising tamping tools designed for movement relative to one another in pairs and for vibration under the power of squeezing and vibration drives and for penetration into the ballast, the tool carrier being longitudinally displaceable relative to the machine frame under the power of a drive pivotally connected thereto.

It is known from Applicants' ~~AT-PS 372,724~~ GB-PS 2 097 845 B that a group of different track maintenance machines arranged one behind the other can be used in particular to create a track position of greater accurracy, as required for the ever-increasing volume of high-speed traffic, and to obtain greater permanence of the correcting work carried out on the position of railway tracks. Although adapted to one another in terms of performance, track maintenance machines of the type in question, which form a so-called "multiple-function train (MFT)" and of which the most important is always a levelling and tamping machine, are independent of one another in regard to their advance movement and their mode of operation. Accordingly, these individual track maintenance machines with their own operator's cabin, their own axle drive and the like can only be used by their own operators and, on the track, with associated track inspection personnel.

In the case of ~~AT-PS 372,724~~ GB-PS 2 097 845 B, the MFT comprises firstly (in the working direction) a continuously advancing ballast cleaning machine, then a step-by-step tamping machine comprising a tamping and track lifting unit and, finally, a

continuous-action stabilizing machine comprising stabilizing tools operable via vibration drives. In this way, the ballast cleaned by the cleaning machine is consolidated by the tamping tools of the tamping machine immediately behind the cleaning machine, the position of the track is vertically and laterally corrected and the track is lowered under control into a deeper set position by the stabilizing machine with consolidation of the ballast. An MFT such as this, of which the constituent machines may be varied according to the particular application involved, has already been very successfully used in practice, although the number of personnel and machines involved is relatively large, particularly when the track inspector required for each machine is taken into account.

In addition, it is known from the Article entitled "Die modernen Systeme Für Gleiserhaltung und Gleisumbau (Modern Track Maintenance and Track Laying Systems)" in the journal "Eisenbahntechnik", number 4, 1986, pages 20 and 21 that a continuously advancing (non-stop) track tamping, levelling and lining machine with or without a separate supporting undercarriage for the tool carrier in the form of an auxiliary frame (for example according to Applicants' GB-PS 2 135 369 B ~~AT-PS 378,387~~) may be used in a high-performance MFT, particularly to increase performance. The tamping machine is followed in the working direction by a continuous-action ballast planing and consolidating machine by which the ballast is planed ahead of a track stabilizer or rather can be delivered to those zones of the track which lie within the effective range of the track stabilizer. This machine has also been very successfully used although, once again, the outlay involved on personnel and machinery is relatively high.

GB-PS 2 146 374 B ~~AT-PS 380,280~~ describes a continuously advancing (non-stop) on-track machine for tamping the sleepers of a track. This machine comprises a machine frame which is supported by

undercarriages and which is pivotally connected to a tool carrier arranged between these undercarriages for a vertically displaceable tamping unit comprising squeezable and vibratable tamping tools and a vertically displaceable lifting and lining unit. A hydraulic cylinder is provided for the longitudinal displacement of the tool carrier relative to the machine frame, so that the tool carrier with the tamping unit advances in steps from sleeper to sleeper while the machine or rather the machine frame advances continuously (non-stop). At its rear end, the machine frame, which is supported on the track by an undercarriage at its front end only, comprises an extension projecting beyond the rear driver's cabin which, at its end, is supported at the centre of an additional machine frame equipped with undercarriages. Mounted between these two undercarriages of the additional machine frame are two vertically displaceable track stabilizing units comprising stabilizing tools operable through vibration drives. Through the unusual frame construction and support of the tamping machine frame on the tool frame connected to the stabilizing units, the weight of the tamping machine is partially transferred to the frame of the stabilizing machine, improving the effect of the stabilizing tools during the lowering of the track into the set position. This combined or rather integrated tamping and stabilizing machine is relatively unique in its construction and often requires the separate use of a following ballast plough to plane the ballast bed for a permanent track position.

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Finally, ~~AT-PS-326,066~~ describes a track tamping machine advancing in steps corresponding to the distance between two sleepers for simultaneously tamping the ballast beneath two adjacent sleepers. The twin tamping unit comprises two outer tamping tools which are designed for penetration into the ballast bed at the sleeper ends, for vibration and for displacement longitudinally of the sleepers. The sleeper

bearing surfaces can be consolidated to a high degree by this machine in conjunction with the pairs of tamping tools squeezable longitudinally of the machine. In order to be able effectively to use sleeper-end consolidators, which follow in the working direction, in this sleeper-end zone tamped by the outer tamping tools, small plough arrangements with obliquely set plough blades are provided between the tamping unit and the sleeper-end consolidator. These plough arrangements are connected for vertical and lateral displacement to the tamping machine for the purpose of planing the narrow strip of ballast between the ballast shoulder and the track. With normal tamping units, i.e. without outer tamping tools, however, plough arrangements such as these are not necessary.

Now, the object of the present invention is to provide a continuously advancing track maintenance machine of the type described at the beginning of which the potential applications are greater and, in particular, more economical.

This object is achieved by a continuously advancing track maintenance machine of the type described at the beginning in that, at its rear end (in the working direction), the machine is pivotally connected or rather coupled to a second machine frame which is supported by undercarriages spaced apart from one another and on which a plough arrangement is mounted between the two undercarriages, the plough arrangement being vertically displaceable under the power of a drive and comprising a centre plough and shoulder ploughs operable through drives. With a continuously advancing (non-stop) track maintenance machine constructed in accordance with the invention, it is now possible in particular, and for the first time, for the ballast bed to be planed after tamping in one and the same operation performed by one and the same machine, so that a corrected and tamped track with uniformly packed sleeper cribs is present after the particularly economical use of only one machine. Accordingly,

the plough arrangement mounted behind the tamping unit on the tamping machine has the particular advantage that the sleeper cribs filled to different levels through the variable tamping of the sleeper bearing surfaces in dependence upon the errors in the position of the track can be uniformly filled - for a more permanent, accurate track position - by the combined use of a centre plough and shoulder plough, so that there is no longer any need to use a separate ballast plough. Accordingly, it is possible immediately to use another machine to complete the work on the track, this other machine comprising a track stabilizer by which the track now uniformly embedded in the ballast can be uniformly lowered into a permanent position, anticipating initial settlement over the entire length of the track. Since the plough arrangement is mounted on its own machine frame pivotally connected to the rear end of the tamping machine frame and supported by its own undercarriages, the individual ploughs are automatically centred, even at relatively tight curves in the track. Another advantage of this frame construction is that, because the two pivotally interconnected machine frames are able to advance continuously together along with the plough arrangement, the ballast is uniformly planed and high tamping performance is achieved while the tool carrier - irrespectively - is able to advance longitudinally in steps with the supporting unit.

In one particularly advantageous embodiment of the invention, the machine with the second machine frame provided for the plough arrangement comprises a third machine frame which is pivotally connected thereto at its end, being supported by two undercarriages spaced apart from one another, and on which a track stabilizing unit arranged between the two undercarriages and designed for vertical displacement through a drive is mounted with stabilizing tools operable through vibration drives. This advantageous combination of three pivotally interconnected machine frames respectively

supporting a tamping unit, a following plough arrangement and, finally, a track stabilizing unit provides for the first time a single track maintenance machine which is capable of continuously working on and completely rehabilitating a track in a single pass. A particular economic advantage in this regard is that planning, machinery and personnel are considerably reduced by the use of a single machine. Since the stabilizing unit and the plough arrangement are best designed for continuous operation, the combination with a continuously advancing, high-performance tamping machine is particularly suitable for rapid and efficient rehabilitation of the track enabling a more uniform or rather accurate overall track position to be obtained. In addition, the fact that the various units are fixedly arranged on a single machine enables them to be accurately and optimally coordinated with one another, particularly in regard to performance.

In another embodiment of the invention, the second machine frame, which at its front end is supported on the rear undercarriage of the first machine frame, is supported at its rear end by another undercarriage, a vertically displaceable sweeping unit preferably connected to a transverse conveyor belt operable by a drive being arranged on a projecting rear end. The arrangement of the sweeping unit after the rear undercarriage of the second machine frame advantageously enables the distance between this undercarriage and the coupling to be kept relatively short. The plough arrangement mounted on the second machine frame between the rear undercarriage and the coupling can thus be accurately and automatically centred, even at very tight curves in the track. Surplus ballast lying on the sleepers can be swept by the sweeping unit arranged on the second machine frame following the plough arrangement onto the transverse conveyor belt which transports it to the shoulder of the ballast bed.

Another advantageous variant of the invention is

characterized in that the second machine frame is pivotally mounted at its respective ends on the rear undercarriage of the first machine frame and on the front undercarriage of the third machine frame supported by two undercarriages spaced apart from one another. The fact that the second machine frame is thus supported at either end on the two adjoining machine frames eliminates the need for more undercarriages and thus enables the overall length of the machine to be shortened.

In another advantageous embodiment of the invention, a vertically displaceable sweeping unit preferably connected to a transverse conveyor belt operable through a drive is arranged on a projecting end of the third machine frame supported by the rear undercarriage. With this sweeping unit arranged immediately behind the stabilizing unit in the working direction, the track can be swept clean after the final stabilizing operation, the sweeping unit removing in particular ballast particles moved onto the sleepers by the horizontal vibration of the stabilizing unit.

In another advantageous embodiment of the invention, separate driver's and operator's cabins are provided at the front end of the first machine frame and at the rear end of the second machine frame and at least one of the total of three on-track undercarriages, preferably in the form of twin-axle bogies, spaced apart from one another is connected to an axle drive. A machine constructed in this way is particularly suitable for withstanding the relatively severe stressing by the tamping, lifting and lining units on the first machine frame and by the plough arrangement on the second machine frame.

In another embodiment of the invention, separate driver's and operator's cabins are arranged at the front end of the first machine frame and at the rear end of the third machine frame and at least one of the total of four on-track undercarriages, preferably in the form of twin-axle bogies,

spaced apart from one another is connected to an axle drive. With a machine such as this, even tight track curves can be rehabilitated without exceeding the clearance profile, despite the relatively long construction. The two driver's and operator's cabins arranged at either end provide readily for in-transit journeys in both directions.

In another preferred embodiment of the invention, the two on-track undercarriages of the first machine frame are arranged at the necessary distance apart for a sufficiently large lifting and lining operation of the lifting and lining unit connected to a levelling and lining reference system, the two on-track undercarriages of the third machine frame being arranged at the necessary distance apart for a sufficiently effective stabilizing operation of the stabilizing unit connected to a levelling reference system. This spacing of the undercarriages associated with each machine frame provides for problem-free correction of the track position or rather track stabilization, the interposition of a second machine frame connected to the plough arrangement reliably preventing the lifting and lining tools and the stabilizing unit from interfering with one another.

In another advantageous embodiment of the invention, the tool carrier designed for longitudinal displacement relative to the first machine frame is connected to a drive, preferably in the form of a hydraulic cylinder, by a cable fixed in the region of the supporting undercarriage and guided over a guide roller, the drive and the guide roller being fixed to the machine frame. In this way, the tool carrier can be brought quickly from its working position into its in-transit position and vice versa without any need for rerigging work. A particular advantage in this regard is that the cable does not intefere with the step-by-step movement of the tool carrier together with the tamping unit from sleeper to sleeper.

Finally, in another embodiment of the invention, a

vertically displaceable and laterally pivotal plough blade is arranged per rail on the front projecting end of the first machine frame connected in particular to the tool carrier supported at its end by a supporting undercarriage. Through this leading plough blade, the sleeper cribs can be uniformly filled, at least in the vicinity of the sleeper bearing surfaces, during the continuous advance of the tamping machine or rather the first machine frame. Uniform conditions for the tamping work to be carried out immediately afterwards are thus established with particular advantage, providing for a permanent and accurate track position.

Two examples of embodiment of the invention are described in detail in the following with reference to the accompanying drawings, wherein:

Figure 1 is a side elevation of a continuously advancing track maintenance machine according to the invention consisting of three pivotally interconnected machine frames on which are arranged a tamping unit, a plough arrangement and a track stabilizing unit.

Figure 2 is a plan view of the machine shown in Figure 1.

Figure 3 is a side elevation of another embodiment of a track maintenance machine formed in accordance with the invention by two pivotally interconnected machine frames, a tamping unit being provided on the first machine frame and a plough arrangement on the second machine frame.

The continuously advancing track maintenance machine 1 shown in Figure 1 is made up of three machine frames 2,3 and 4 arranged one behind the other longitudinally of the machine. These machine frames 2,3,4 are each joined or coupled to one another at their ends by a coupling 5,6. The front, first machine frame 2 (in relation to the working direction indicated by an arrow 7) is supported by two undercarriages 8 spaced far apart from one another on a track consisting of rails 9 and sleepers 10. The rear, third machine frame 4 is

also supported on the track by two undercarriages 11 arranged at either end. The central, second machine frame is pivotally mounted at one end on the rear undercarriage 8 of the first machine frame 2 and at its other end on the front undercarriage 11 of the third machine frame 4. A driver's and operator's cabin 12 is arranged at the front end of the first machine frame 2 and at the rear end of the third machine frame 4. The undercarriages 8 and 11 of the first and third machine frames 2 and 4 each comprise an axle drive 13. A pole-like tool carrier 14 with a supporting undercarriage 15 at its end is provided between the two end undercarriages 8 of the front, first machine frame 2. Immediately in front of the supporting undercarriage 15, a vertically displaceable twin tamping unit 17 comprising tamping tools 18 designed for movement relative to one another in pairs and for vibration under the power of squeezing and vibration drives and for penetration into the ballast for the purpose of tamping the ballast beneath two adjacent sleepers is connected to the tool carrier 14. A preceding lifting and lining unit 19 designed for vertical and lateral displacement under the power of drives and comprising lifting and lining tools designed for application to the rails 9 is also connected to the tool carrier 14. A longitudinal displacement drive 20 pivotally connected to the machine frame 2 is provided for the longitudinal displacement of the tool carrier 14 together with the tamping and lifting/lining units 17,19. A levelling and lining reference system 22 designed to run along the rails 9 of the track through feeler rollers 21 is associated with the first machine frame 2. A vertically displaceable and laterally pivotal plough blade 23 is arranged per rail 9 on the front projecting end of the first machine frame 2.

The tool carrier 14 designed for longitudinal displacement relative to the first machine frame 2 is connected for vertical displacement to a drive 26 in the form of a

hydraulic cylinder by a cable 25 fixed in the region of the supporting undercarriage 15 and guided over a guide roller 24, the drive 26 and the guide roller 24 being fixed to the machine frame 2.

A plough arrangement 27 is provided on the second machine frame 3 connected at either end by a coupling 5,6 to the adjoining machine frame 2,4. The plough arrangement 27 consists of a leading shoulder plough 28 and a trailing centre plough 29. The shoulder plough 28 comprises two ploughs 30 which are arranged spaced apart from one another transversely of the longitudinal axis of the machine and which are connected to the second machine frame 3 for rotation about a vertical axis for working on the shoulders of the ballast bed, each of the ploughs 30 being designed to pivot about said axis under the power of a drive 31. Further drives 32 are provided for the vertical displacement of the ploughs 30. The trailing centre plough 29 consists of plough plates 33 which are arranged in the form of a V and each of which comprises a U-shaped rail tunnel 34 covering the rail where it passes over the rail. The front end of each plough plate 33 situated in the sleeper end zone is connected to a short plough blade 35 via a vertical rotation axis. The centre plough 29 as a whole is designed for vertical displacement relative to the machine frame 3 under the power of drives 36.

On the rear, third machine frame 4 of the track maintenance machine 1, two track stabilizing units 37 are arranged one behind the other longitudinally of the machine between the two end undercarriages 11. The track stabilizing units 37 are designed for vertical displacement by a drive 38 and can be brought into form-locking engagement with the rails 9 by laterally pivotal stabilizing tools 39. From a vibration drive 40, horizontal vibrations can be transmitted to the track transversely of its axis via the stabilizing tools 39. A reference system 41 supported on the track

by feeler rollers is provided on the third machine frame 4 for controlling the lowering of the track. A sweeping unit 43 designed for vertical displacement under the power of a drive 42 is arranged with a transverse conveyor belt 45 operable by a drive 44 on a projecting rear end of the third machine frame 4. A central power supply 46 is provided for supplying the various drives with power.

As shown in Figure 2, the laterally pivotal stabilizing tools 39, which are in the form of lifting rollers, are in pincer-like engagement with the rails 8 of the track, so that the horizontal vibrations generated by the vibration drive 40 can be transmitted to the track and to the ballast. The couplings 5 and 6 by which the machine frames 2,3 and 4 are joined together enable the machine frames to rotate freely about a vertical axis. The ploughs 30 and plough blades 35 and 23 can be varied as required in their angular position longitudinally of the machine.

The simpler embodiment of a track maintenance machine 47 according to the invention shown in Figure 3 consists of two machine frames 49, 50 arranged one behind the other longitudinally of the machine and joined to one another at their ends by a coupling 48. A driver's and operator's cabin 51 is provided at either longitudinal end of the machine 47. For power supply, a power supply unit 52 is provided on the rear, second machine frame 50. The front, first machine frame 49 is supported on a track 57 consisting of sleepers 55 and rails 56 by two undercarriages 53 spaced far apart from one another. Provided between these two bogie-type undercarriages 53 is a pole-like tool carrier 59 which comprises a supporting undercarriage 58 at one end and of which the front end is mounted for longitudinal displacement in a bearing 60 connected to the machine frame 49 and is connected to a longitudinal displacement drive 61. Immediately in front of the supporting undercarriage 58 in the working direction of the machine 47 indicated by an

arrow 62, a vertically displaceable tamping unit 63 comprising tamping tools designed for movement relative to one another, for vibration and for penetration into the ballast is connected to the tool carrier 59. In addition, a vertically and laterally displaceable lifting and lining unit 64 with lifting and lining tools designed for application to the rail 56 is provided between the bearing 60 and the tamping unit 63. The tool carrier 59, which is longitudinally displaceable relative to the first machine frame 49, is connected to a drive 67 in the form of a hydraulic cylinder by a cable 66 which is fixed in the region of the supporting undercarriage 58 and is guided around a guide roller 65. In the same way as the guide roller 65, the drive 67 is fixed to the machine frame 49. A levelling and lining reference system 68 designed to run along the rails 56 through feeler rollers is associated with the first machine frame 49. A vertically displaceable and laterally pivotal plough blade 69 is provided per rail 56 at the front end of the machine 47.

A plough arrangement 72 designed for vertical displacement by drives 71 and comprising a centre plough 74 and shoulder ploughs 75 operable by drives 73 is provided on the rear, second machine frame 50 immediately before a rear, end undercarriage 70. A vertically displaceable sweeping unit 77 connected to a drive-operated transverse conveyor belt 76 and comprising a rotating brush extending over the entire width of the track is arranged on the projecting end of the second machine frame 50 supported on the track by the rear undercarriage 70.

The mode of operation of the track maintenance machine 1 is described in detail in the following with reference to Figures 1 and 2.

When the track maintenance machine 1 reaches the section of track to be worked on, where the track ballast has just been cleaned by a ballast cleaning machine, the tool carrier 14 together with the tamping unit 17 and the lifting and

lining unit 19 is lowered by actuation of the drive 26 from the in-transit position into the working position in which the supporting undercarriage 15 is applied to the track. At the same time, the front plough blades 23, having been set at the required angle, are lowered onto the track. In addition, the plough arrangement 27 arranged on the second machine frame 3 is brought into its working position by lowering and setting of the blade angle. The two track stabilizing units 37 are also lowered from an in-transit position into the working position and are form-lockingly connected to the track by application of the stabilizing tools 39 to the rails 9. The sweeping unit 43 is lowered until the brush comprising tube-like sweeping elements touches the sleepers 10. After the vibration drive by which the tamping tools 18 are vibrated and the two vibration drives 40 by which the stabilizing units 37 are horizontally vibrated have been brought into operation, the axle drive 13 is actuated for the continuous (non-stop) advance of the entire track maintenance machine 1 with the three machine frames 2,3 and 4. At the same time, ballast ejected onto the sleeper ends by the ballast cleaning machine is removed by the two plough blades 23 each associated with a rail 9. During the tamping of two adjacent sleepers 10 by the lowered tamping unit 17, the entire tool carrier 14 stays in the same place, a relative displacement occurring between the first tool frame 2 and the tool carrier 14. When the rear end position (shown in dash-dot lines) is reached on completion of the tamping operation, the entire tool carrier 14 is again displaced into its frontmost end position by actuation of the longitudinal displacement drive 20 so that another tamping cycle can be started.

By corresponding lowering and application of the ploughs 30 to the ballast shoulder, ballast is transported upwards from the shoulder to the top of the sleeper where it is transported by the immediately following V-shaped plough plates 33 over the

rail tunnel 34 to the middle of the track where it is packed into the sleeper cribs and planed. This uniformly fills the sleeper cribs which are filled to different levels through the difference in tamping intensity arising out of the different errors in the position of the track. Accordingly, the track is uniformly ballasted in the region of the third machine frame 4 and may be lowered into a permanent set position by the two track stabilizing units 37. Since the track is treated "in one pass" - from correction of the track position through tamping and ballasting to the final controlled lowering of the track - by the machine 1 according to the invention through its various units and systems, it is possible to establish a particularly accurate and permanent track position. Since the individual units accommodated on a single machine are coordinated precisely with one another, it is possible to obtain a particularly high daily output, particularly by virtue of the continuous tamping cycle.

By means of the simpler track maintenance machine 47 shown in Figure 3, the track can be brought into an exact vertical and lateral position by means of the tamping, lifting and lining units 63, 64, for example after cleaning of the ballast bed by a ballast cleaning machine, the corrected track being uniformly ballasted immediately afterwards by the plough arrangement 71 in precise coordination with the tamping rate. Accordingly, a corrected track uniformly ballasted to maintain its vertical and lateral position is present after the tops of the sleepers have been cleaned by the sweeping unit 76. In order to anticipate initial settlement and to open the track more quickly to normal rail traffic, it is best to use a track stabilizing machine after the machine 47 has finished its work.

CLAIMS

1. A continuously advancing (non-stop) track maintenance machine for tamping the ballast beneath the sleepers of a railway track, comprising a machine frame supported by two undercarriages spaced apart from one another and a tool carrier connected to the machine frame and arranged between the two undercarriages for a vertically displaceable lifting and lining unit and at least one vertically displaceable tamping unit comprising tamping tools designed for movement relative to one another in pairs and for vibration under the power of squeezing and vibration drives and for penetration into the ballast, the tool carrier being longitudinally displaceable relative to the machine frame under the power of a drive pivotally connected thereto, characterized in that, at its rear end (in the working direction), the machine (1,47) is pivotally connected or rather coupled to a second machine frame (3,50) which is supported by undercarriages (11,70) spaced apart from one another and on which a plough arrangement (27;72) is mounted between the two undercarriages (11; 53,70), the plough arrangement being vertically displaceable under the power of a drive (32,36;71) and comprising a centre plough (29;74) and shoulder ploughs (28;75) operable through drives (31;73) (Figure 3).

2. A machine as claimed in claim 1, characterized in that the machine with the second machine frame (3) provided for the plough arrangement (27) comprises a third machine frame (4) which is pivotally connected thereto at its end, being supported by two undercarriages (11) spaced apart from one another, and on which a track stabilizing unit (37) arranged between the two undercarriages and designed for vertical displacement through a drive (38) is mounted with stabilizing tools (39) operable through vibration drives (40).

3. A machine as claimed in claim 1, characterized in that the second machine frame (50), which at its front end is supported on the rear undercarriage (53) of the first machine frame (49), is supported at its rear end by another under-

carriage (70), a vertically displaceable sweeping unit (77) preferably connected to a transverse conveyor belt (76) operable by a drive being arranged on a projecting rear end (Figure 3).

4. A machine as claimed in claim 1 or 2, characterized in that the second machine frame (3) is pivotally mounted at its respective ends on the rear undercarriage (8) of the first machine frame (2) and on the front undercarriage (11) of the third machine frame (4) supported by two undercarriages (11) spaced apart from one another (Figure 1).

5. A machine as claimed in claim 2 or 4, characterized in that a vertically displaceable sweeping unit (43) preferably connected to a transverse conveyor belt (45) through a drive is arranged on a projecting end of the third machine frame (4) supported by the rear undercarriage (11) (Figure 1).

6. A machine as claimed in claim 1 or 3, characterized in that separate driver's and operator's cabins (51) are provided at the front end of the first machine frame (49) and at the rear end of the second machine frame (50) and at least one of the total of three on-track undercarriages (53), preferably in the form of twin-axle bogies, spaced apart from one another is connected to an axle drive (54) (Figure 3).

7. A machine as claimed in any of claims 1 to 5, characterized in that separate driver's and operator's cabins (12) are arranged at the front end of the first machine frame (2) and at the rear end of the third machine frame (4) and at least one of the total of four on-track undercarriages (8) preferably in the form of twin-axle bogies is connected to an axle drive (13) (Figure 1).

8. A machine as claimed in any of claims 1 to 7, characterized in that the two on-track undercarriages (8) of the first machine frame (2) are arranged at the necessary distance apart for a sufficiently large lifting and lining operation of the lifting and lining unit (19) connected to a levelling and lining reference system (22), the two on-track

undercarriages (11) of the third machine frame (4) being arranged at the necessary distance apart for a sufficiently effective stabilizing operation of the stabilizing unit (37) connected to a levelling reference system (41).

9. A machine as claimed in any of claims 1 to 8, characterized in that the tool carrier (14;59) designed for longitudinal displacement relative to the first machine frame (2; 49) is connected to a drive (26;67), preferably in the form of a hydraulic cylinder, by a cable (25;66) fixed in the region of the supporting undercarriage (15;58) and guided over a guide roller (24;65), the drive (26;67) and the guide roller (24;65) being fixed to the machine frame (2;49).

10. A machine as claimed in any of claims 1 to 9, characterized in that a vertically displaceable and laterally pivotal plough blade (23;69) is arranged per rail (9;56) on the front projecting end of the first machine frame (2;49) connected in particular to the tool carrier (17;59) supported at its end by a supporting undercarriage (15;58).

11. A machine substantially as hereinbefore described with reference to Figures 1 and 2 or Figure 3 of the accompanying drawings.

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