

Installation for selective one-sided or two-sided
zinc-plating

5 The invention relates to an installation for the
selective one-sided or two-sided zinc-plating of
continuously passing steel strip.

10 The demands for steel strip which is zinc-plated on one
side, in particular for processing as body sheet, which
have increased continuously in recent years, have lead
to an increasing requirement for installations by means
of which such strip can be produced. However, since as
before there is a considerable demand for steel strip
which is zinc-plated on both sides, modern coating
installations should be capable of producing both types
of coated strip, and conversion from one-sided to two-
15 sided coating should take place as quickly as possible
and at low expense.

20 An installation for one-sided and two-sided zinc-
plating of continuously passing steel strip which has
exchangeable assemblies is known from JP-A-57 41 362.
Here the assembly provided for one-sided zinc-plating
has deflection rollers located above the level of the
bath which cooperate with a coating roller which dips
into the zinc bath. A base roller is provided for two-
sided zinc-plating. For replacement, the strip has to
25 be pulled out through a hatch and separated into two
sections. After the other assembly has been attached,
the strip is introduced into it and has to be welded
together at the cutting site. This is time-consuming
and involved to perform.

30 Another installation for one-sided or two-sided coating
is described in DE 33 13 218 A1. Using this

installation, both one-sided and two-sided coating is possible in a favourable manner, but the changeover from one process to the other requires a series of conversion measures on the installation which are extremely costly in terms of labour and time. Since no treatment of the strip can take place during this time, a considerable loss of production has to be expected.

It has also already been proposed (European Patent Application 00 64 922) to design an installation for one-sided and two-sided zinc-plating in such a manner that both process steps can be performed with the same installation by moving and swivelling very varied parts of the installation. However, this installation has the drawback of very costly mechanics and kinematics which, in the event of disruptions, mean that even longer idle times of the installations and larger losses of production must be expected. This also applies when parts of the installation have to be serviced, replaced or cleaned.

Departing from the known prior art, it is the object of the present invention to provide an installation for the one-sided or two-sided zinc-plating of continuously passing steel strip which has a simple construction and permits rapid changing-over of the installation from one process to the other with the strip material inserted, i.e. without the latter having to be taken out and cut up.

This object is obtained according to the invention with the features of Claim 1.

The background to the invention is thus the exchanging of complete "assemblies" for one-sided and two-sided

zinc-plating, each "assembly" containing the parts necessary for the respective process steps fully prepared.

5 Firstly, the gas-tight connection necessary between the duct leading into the furnace and the zinc bath is guaranteed, and secondly it is ensured that it is possible to lift out those parts of the installation provided for one-sided or two-sided zinc-plating in each case without severing the strip. To the same end,
10 advantageously provision may further be made for the housing for one-sided zinc-plating to be divided into two parts and for the junction of the housing parts to run in the plane of the emerging strip. Separating both housing parts means that they can readily be
15 removed from both sides of the strip, and according to another feature of the invention advantageously the deflection roller or rollers are mounted in one part of the housing which is divided into two and a nozzle meter or an air squeegee nozzle for evening out the coating
20 thickness is located in the other part of the housing, so that they can each be removed with the relevant housing parts.

An embodiment of the invention is illustrated in the drawings and will be described below.

25 Fig. 1 shows a cross section through the installation according to the invention for one-sided zinc-plating and

Fig. 2 shows a cross-section through the installation for two-sided zinc-plating.

Fig. 1 shows a trough W in which liquid zinc is located. Above the trough W and the zinc bath, the apparatus for one-sided coating of the strip marked B is shown, which apparatus consists of the housing parts 2a, 2b, the lower parts of which dip into the zinc Z and in which the deflection rollers 3a, 3b and the nozzle meter 4 are mounted. The coating roller 7, which is located on the free end of the lever arm 8, is pivoted from below onto the strip B in the region of the deflection roller 3b. The lever arm 8 is pivotable about the hinge point 12 into a position in which the coating roller is located, as indicated by 7a. The two housing parts 2a, 2b are flange-connected together, with the plane of separation of the housing sections 2a, 2b being located in the plane of the emerging strip B which is designated 1. On the left-hand side in the plane of the drawing, the housing part 2a is connected at 6 to the duct 5 by an appropriate flange connection. The flange 6 runs perpendicular to the surface of the zinc bath Z and extends into the zinc bath. The flange connection at 6 is gas-tight, as are the entire housing parts 2a, 2b, which are sealed off below by the zinc bath.

If the installation is to be used for the two-sided zinc-plating of strip B which is passing through, the housing parts 2a, 2b, after the detaching of the flange connection 6 and separation of the housing parts 2a and 2b, together with the deflection rollers 3a, 3b and the nozzle meter 4 mounted therein, are removed and replaced by a carrier 11 to which the stabilising roller 13, the deflection roller 10 and a housing 5b are attached. The coating roller 7 on the lever arm 8 is replaced by the stabilising roller 9 and is brought into the appropriate

required position relative to the strip by pivoting the lever arm 8 about the hinge point 12.

5 The housing 5b located on the carrier 11 represents an extension of the duct 5 which leads from the furnace into the zinc Z. The position of the flange connection perpendicular to the zinc bath and the projection of the lower boundary of the duct into the liquid zinc yields a shape of the housing 5b which surrounds the strip on three sides and closes off the surrounded room in gas-tight manner firstly from the liquid zinc bath Z and by 10 flange-connecting at 6 from the duct 5. The flange connection 6 is identical to the connection to the housing parts 2a, 2b, so that both parts can be exchanged for one another in module-like manner. The 15 design of the two parts of the installation is selected so that the strip B can remain in the installation when a change is made from one-sided to two-sided zinc plating.

20 The invention permits rapid changing from one process to the other, the cost of the parts of the installation used being kept low, and it being possible in a favourable manner to perform maintenance and repair of the respective parts of the installation which are not required outside the line by changing complete 25 "assemblies" in order to be able to use the correspondingly prepared parts again in the shortest possible time.

Claims

1. An installation for the selective one-sided or two-sided zinc-plating of continuously passing steel strip which is guided through a duct (5) adjoining the furnace and which is under a protective gas atmosphere to a container filled with liquid zinc and in the case of two-sided zinc-plating is passed therein about a deflection roller (10) located inside the zinc bath and optionally stabilising rollers (9, 13), and in the case of one-sided zinc-plating is guided, in the same direction as for two-sided zinc-plating, about at least one deflection roller (3a, 3b) located above the level of the zinc bath inside a housing (2) which is flange-connected in gas-tight manner to the duct (5), wherein the deflection roller (3b) is allocated a coating roller (7) which dips into the zinc bath, the flange connection (6) between the duct (5) and housing (2) is readily detachable and extends approximately perpendicular to the plane of the level of the bath and transversely to the strip (S; P) and extends into the zinc bath (Z) and further the housing (2) with the deflection roller (3b) for the one-sided zinc-plating being exchangeable for a housing (5b) with a carrier (11) for the deflection roller (10) which is located in the zinc bath for two-sided zinc-plating, which housing (5b) surrounds the strip (B) on three sides and is open to the duct (5) and also to the zinc bath (Z) into which the lower region of the housing (5b), like the housing (2a, 2b), dips, wherein the coating roller (7) which dips into the bath is mounted outside the housing (2) on a pivoting lever arm (8) which has the bearing for a stabilising roller (9) for two-sided zinc-plating, for which roller the



coating roller (7) can be exchanged for one-sided zinc-plating.

5 2. An installation according to Claim 1, characterised in that the housing (2) for one-sided zinc-plating is divided into two parts (2a, 2b) and the junction (1) of the housing parts (2a, 2b) runs in the plane of the advancing strip (B).

10 3. An installation according to Claim 2, characterised in that the deflection roller or rollers (3a, 3b) are mounted in one part (2a) of the housing (2a) which is divided into two and a nozzle meter (4) or an air squeegee nozzle for evening out the coating thickness is located in another part of the housing (2b), so that they can each be removed with the relevant
15 housing parts (2a, 2b).