

(19)



(11)

EP 2 669 022 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

04.12.2013 Bulletin 2013/49

(51) Int Cl.:

B21C 37/08 ^(2006.01)

B21C 37/083 ^(2006.01)

B21C 47/00 ^(2006.01)

B21C 49/00 ^(2006.01)

(21) Application number: **12169726.2**

(22) Date of filing: **29.05.2012**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

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(54) **Method for producing longitudinally welded tubes**

(57) The present invention refers to a method of manufacturing pipes welded longitudinally comprising longitudinal cutting of the primary material tape into tape for the pipes, profiling the tapes into pipes and longitudinal welding, characterized in that:

a) The primary tape is unreeled from the decoiler, wherein the decoiler is equipped with the photocells under and above of the coil of primary material tape and after the fixing of the coil in the coil-support of the decoiler an automatic control system adjusts the tape horizontally along a rotation axis, perpendicularly to the center line of the manufacturing line by the hydraulic cylinders till the coil is set centrally, in order to align symmetry line of the metal sheet of the primary material tape to the center line of

the manufacturing line, wherein position of the coil of the primary material tape is controlled by the automatic control system through the usage of signals coming from the photocells, before cutting the metal tape into pipes.

b) Primary tape from phase a) is cut into sheets for pipes

c) Sheets for pipes from phase b) are transferred to the compensator or preferably through the compensating pit to the recoiler

d) Sheets for the pipes are transferred from the compensator or the recoiler to the profiling machinery

e) Profiled tape for the pipes is transferred to the longitudinal welding

f) The pipe from phase e) is conditioned in a cooling agent

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Description

[0001] Presented invention refers to a method of manufacturing the pipes welded longitudinally. Presented invention finds its application in the building industry for manufacturing of the welded pipes, for instance metal or steel pipes.

[0002] The metal pipes are commonly used structural elements in the building industry. Commonly known method of improvement of the structural strength used for the pipes is a well-known method of bilateral welding of the joined edges of a metal sheet. This method is used for instance in the manufacturing of the pipes used for a gas transmission - method DSAW: Double Submerged Arc Welded. The international patent application W02010102607 presents a method of manufacturing of the big diameter pipes with the usage of DSAW method as well as a method of a quality inspection of welding. Other commonly known method of manufacturing of the welded pipes is an induction welding method. Similarly like in case of DSAW MIG/MAG also this method requires a continuity of supplies of a metal sheet for the profiling process. Each gap between proceeding and following blanks of the metal sheet demands a readjustment of the profiling machinery after stoppage needed for joining the sheets. During that time which is needed for the machinery readjustment, there might be produced pipes of unsatisfying parameters that have to be scrapped. Moreover, sheets dedicated for this kind of a method of the pipes manufacturing must comply with a precise dimensional requirements, which should be kept also in the pre-processes of longitudinal sheets cutting. Summarizing, there is still a real need of providing a method of manufacturing of the pipes welded longitudinally for which there are used sheets of material of the same width and for which joining of the sheets does not demand profiling process stoppage or scrapping of the pipes formed during joining of the sheets which are not fulfilling requested characteristics. Unexpectedly, problems mentioned above are solved by the presented invention.

[0003] The subject of the presented invention is the method of manufacturing of the pipes welded longitudinally that considers longitudinal cutting of a primary material tape on the sheets entering to the process, profiling of the sheets on the pipes, longitudinal welding **characterized in that:**

a) The primary tape is unreeled from the decoiler, wherein the decoiler is equipped with the photocells under and above of the coil of primary material tape and after the fixing of the coil in the coil-support of the decoiler an automatic control system adjusts the tape horizontally along a rotation axis, perpendicularly to the center line of the manufacturing line by the hydraulic cylinders till the coil is set centrally, in order to align symmetry line of the metal sheet of the primary material tape to the center line of the manufacturing line, wherein position of the coil of the pri-

mary material tape is controlled by the automatic control system through usage of the signals coming from the photocells, before the cutting the metal tape into the pipes.

b) Primary tape from phase a) is cut into the sheets for the pipes

c) Sheets for the pipes from phase b) are transferred to the compensator or preferably through the compensating pit to the recoiler

d) Sheets for the pipes are transferred from the compensator or the recoiler to the profiling machinery

e) Profiled tape for the pipes is transferred to the longitudinal welding

f) The pipe from phase e) is conditioned in cooling agent

[0004] In order to avoid repeated stoppages of manufacturing machinery during loading with the consecutive coils of primary material tape, before the profiling section of the line there is used a special compensator which is buffering the metal sheets that are possibly as long as feasible and that allows also joining (by welding) the following metal sheets during the continuous production. In the compensator tape winds horizontally in the coil through winding consecutive external layers and for the profiling it is taken from the internal layer. There is a dedicated group of the rollers that during obtaining of the material twists the tape for the pipes and changes its run from vertical to horizontal simultaneously changing the direction parallelly according to the same plane. The benefit resulting from this solution is that a tape can be obtained from the internal coil from the compensator in the continuous way while the external coil can be supplied in the discrete way - so there is a compensation between continuous run on the output and discrete run in the input. Thanks to the above, a continuous manufacturing process can be kept that allows to avoid the technological stoppages dedicated for the reloading of the coil of primary material tape (it is possible to join tapes of different material thicknesses and different widths but in a limited range) and minimize production of the pipes that are of unsatisfying parameters. Moreover, centering of the beginning of the sheet prevents a sloped cutting and minimizes scrap at edges of the primary material tape. The compensating pit allows simultaneous winding of two coils on one shaft with the usage of higher number of coils in case of materials of different thicknesses.

Example 1

[0005] Method of manufacturing of the pipes welded longitudinally includes: cutting the primary material tape into tapes for the pipes, profiling the tapes for the pipes and their longitudinal welding. Primary material tape was unreeled from the decoiler, whereas the decoiler was equipped with the photocells under and above the properly fixed coil of the primary material tape and when it was already fixed in the coil support, the automatic control

system has adjusted the tape horizontally along a rotation axis, perpendicularly to the center line of the manufacturing line by the hydraulic cylinders till the coil was set centrally there were aligned symmetry line of the metal sheet of the primary material tape and the center line of the manufacturing line, wherein the position of the coil of the primary material tape was controlled by the automatic control system through the usage of the signals coming from the photocells, before cutting the metal tape into pipes. Successively, the primary tape was cut into the sheets for the pipes and the obtained tape was transferred through the compensating pit to the recoiler and successively unreeled to the compensator and successively was transferred to the profiling machinery. So profiled tape for the pipes was transferred to the longitudinal welding. Welded pipe was conditioned in a cooling fluid.

Claims

1. Method of manufacturing the pipes welded longitudinally comprising longitudinal cutting of the primary material tape into tape for the pipes, profiling of the tapes into pipes and longitudinal welding, **characterized in:**
 - a) The primary tape is unreeled from the decoiler, wherein the decoiler is equipped in the photocells under and above of the coil of primary material tape and after the fixing of the coil in the coil-support of the decoiler an automatic control system adjusts the tape horizontally along a rotation axis, perpendicularly to the center line of the manufacturing line by the hydraulic cylinders till the coil is set centrally, in order to align symmetry line of the metal sheet of the primary material tape to the center line of the manufacturing line, wherein position of the coil of the primary material tape is controlled by the automatic control system through usage of the signals coming from the photocells, before the cutting the metal tape into the pipes.
 - b) Primary tape from phase a) is cut into the sheets for the pipes
 - c) Sheets for the pipes from phase b) are transferred to the compensator or preferably through the compensating pit to the recoiler
 - d) Sheets for the pipes are transferred from the compensator or the recoiler to the profiling machinery
 - e) Profiled tape for the pipes is transferred to the longitudinal welding
 - f) The pipe from phase e) is conditioned in cooling agent



EUROPEAN SEARCH REPORT

Application Number
EP 12 16 9726

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 14 52 360 A1 (LORRAINE ESCAUT SA) 27 March 1969 (1969-03-27) * page 1, paragraph 1 * * page 2, paragraphs 4,5 * * page 3, paragraph 4 - page 7, paragraph 2; figures 1,2 * -----	1	INV. B21C37/08 B21C37/083 B21C47/00 B21C49/00
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Place of search Munich		Date of completion of the search 30 October 2012	Examiner Ritter, Florian
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			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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