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UNWINDING DEVICE FOR BAND-SHAPED ROLLED GOODS

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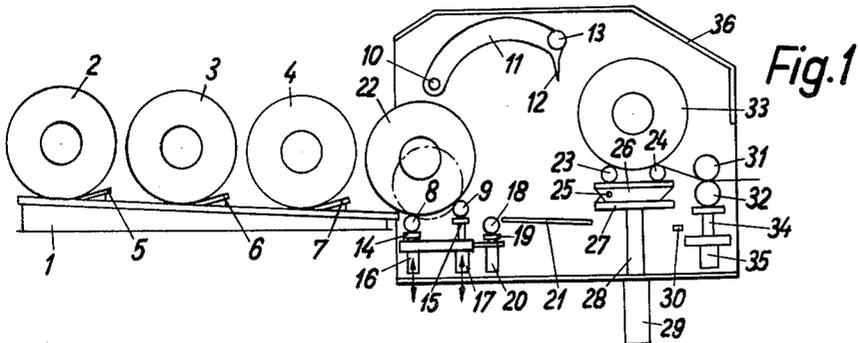


Fig. 1

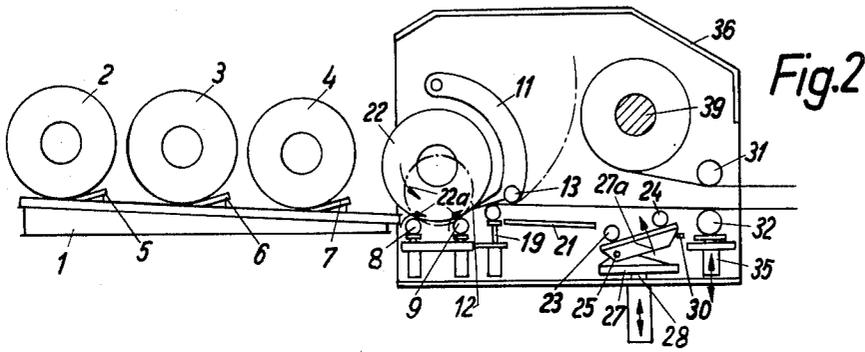


Fig. 2

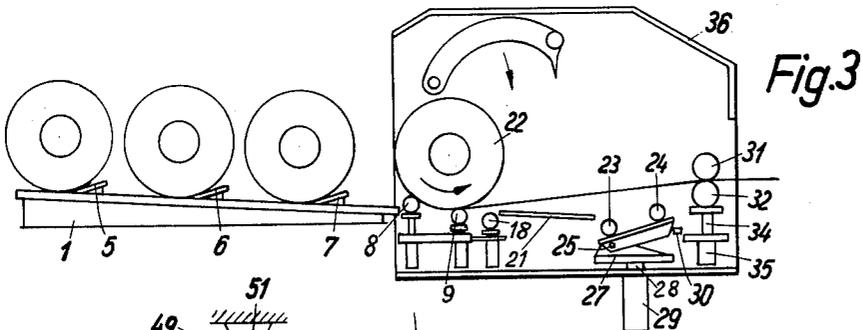


Fig. 3

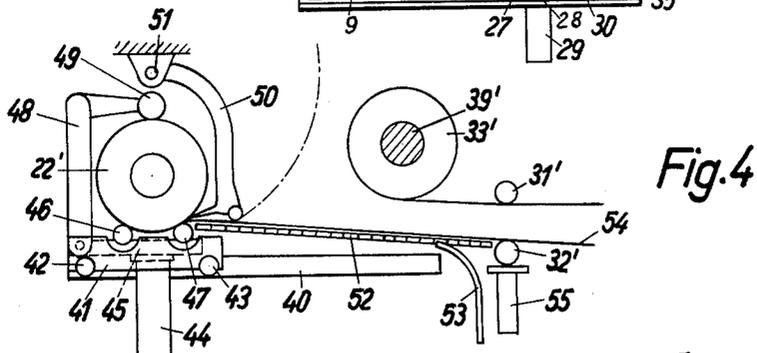


Fig. 4

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**UNWINDING DEVICE FOR BAND-SHAPED
ROLLED GOODS**

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9 Claims. (Cl. 242—78.8)

The present invention relates to an unwinding device for band-shaped rolled goods, particularly for single-way-cold band rolling mills and band working trains.

In order to achieve a maximum amount of economy in single-way-cold rolling mills, particularly in multi-framed, continuously working rolling trains, a most uninterrupted reel succession is aimed at.

It is not possible to provide a continuous operation with the known unwinding devices. It is indeed possible to shorten the operational time periods by providing additional labor, however, even such shortening of the operational time periods has its limits.

It is one object of the present invention to provide an unwinding device for band-shaped rolled goods, which solves the problem of making possible an uninterrupted reel succession.

It is another object of the present invention to provide an unwinding device for band-shaped rolled goods, which resides, in the first place, in an arrangement, according to which two working stations follow a place for the reel storage, one of which working stations serves the opening of the reel and from which the start of the band of the opened reel is advanced to such extent below the reel unwound from the second working station, that upon running out of the band end of the unwound reel, the start of the band of the reel opened at the first working station may be fed continuously to the rolling mill.

It is yet another object of the present invention to provide an unwinding device for band-shaped rolled goods, wherein suitably, the first working station of the device comprises two carrying rollers which are liftable and lowerable independently from each other, preferably, by means of hydraulic means, which carrying rollers are equipped with a drive designed to rotate the reel carried by them. The carrying rollers of the first working station can be driven independently from each other by particular electric motors. A reel opener, which is designed in conventional manner, can be disposed at the first working station. Suitably, the work opener consists of a lever swingable about an axis parallel to the reel axis and disposed above the reel arranged at the first working station, which lever terminates in a slotting tool serving the opening of the reel.

It is still another object of the present invention, to provide an unwinding device for band-shaped rolled goods, wherein the second working station comprises a preferably hydraulically liftable and lowerable table, which is equipped with two carrying rollers for receiving the reel to be unwound. The carrying rollers can be disposed on a plate swingable on the table in such manner, that this plate serves as holding device for the reel moved from the first working station to the second working station.

It is still a further object of the present invention to provide an unwinding device for band-shaped rolled goods, wherein a take-off device, preferably, a spreader winch, which can be rolled laterally into the lifted reel, is disposed above the lifting and lowering table of the second working station of the device. It is of particular advantage, if a driving apparatus follows the second working station, the lower roller of the driving apparatus being lifted and lowered, preferably by hydraulic means.

It is also still another object of the present invention to provide an unwinding device for band-shaped rolled goods, wherein the first working station is designed in such manner, that it consists of a table horizontally displaceable up to the second working station, which table is equipped with a preferably hydraulically operable lifting device. Simultaneously driven, or also independently driven carrier rollers can be disposed on the table. The first working station can also be equipped with a device which serves the prevention of the springing up of the opened reel. In simplest manner, this device can consist of a roller which is disposed on a swingable lever, with which the roller can be swung to a point disposed oppositely the carrying rollers onto the periphery of the reel to be opened.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawing, in which:

FIGURE 1 is a schematic elevational view of the unwinding device including a reel storage and two working stations;

FIG. 2 is an elevation of the unwinding device, similar to that of FIG. 1, however, in an advanced operational position;

FIG. 3 is an elevation of the unwinding device similar to that of FIG. 2 in a still further advanced operational position; and

FIG. 4 is a schematic elevational view of another embodiment of the unwinding device.

Referring now to the drawings and in particular to the embodiment disclosed in FIGS. 1 to 3, the reel storage comprises a take-off slope 1, on which the reels 2, 3 and 4 are secured by means of liftable and lowerable holding members 5, 6 and 7. Two carrying rollers 8 and 9 are provided in a first working station serving the preparation of the reel. The two carrying rollers 8 and 9 are equipped with electric drives (not shown) operating independently from each other. A reel opener 11 is disposed swingably about a bolt 10 above the first working station, which reel opener 11 terminates in a slotting tool 12. The reel opener 11 can be lifted and lowered by a hydraulic device (not shown). A rejecting roller 13 is disposed on the reel opener 11. The carrying rollers 8 and 9 rest on the pistons 14 and 15 of hydraulic lifting devices, the pistons 14 and 15 reciprocating in corresponding cylinders 16 and 17. The hydraulic lifting devices of the carrying rollers 8, 9 can be operated independently from each other.

A directional roller 18 is disposed on a piston 19 of a hydraulic lifting device and the piston 19 reciprocates in a corresponding lifting cylinder 20. A table 21 is arranged behind the directional roller 18, the reel 22, rolling off over the table 21 onto the second working station comprising carrying rollers 23 and 24. The start of

the reel 22 can be fed over the table 21 below the running-off band of the reel present in the second working station.

The rollers 23 and 24 are mounted on a plate 26 which is swingable about an axle 25, which plate 26 rests on a table 27 forming the upper part of a hydraulic snap set 28 reciprocating in a corresponding hydraulic pressure cylinder 29. The downward movement of the plate 26 is limited laterally by an abutment 30. The reel 33 is unwound by the upper and the lower driving rollers 31 and 32 of a driving apparatus, which reel 33 is disposed in the second working station. The lower driving roller 32 is liftable and lowerable by means of a hydraulic device consisting of a piston 34 reciprocating in a pressure cylinder 35. The two working stations are covered by a housing 36.

The operation of this device is as follows:

By lowering the holding member 7, the reel 22, until now disposed in front of the holding member 7, is rolled off to the carrying rollers 8 and 9. The carrying roller 8 stands, thereby, in its lowermost position, while the carrying roller 9 is in a lifted position. The reels 2, 3 and 4 are disposed in front of the holding members 5, 6 and 7. The reel 33 resting on the carrying rollers 23 and 24 and already opened, is unwound. The band is, thereby, fed to the rolling mill by means of the driving rollers 31 and 32.

In the working phase shown in FIG. 2, the reel opener 11 with the slotting tool 12 is swung to the reel 22, and by rotation of the rollers 8, 9 in the direction of the arrows 22a, the reel 22 has been moved towards the slotting tool 12 to such extent, that the slotting tool 12 has gripped the start of the band. By further unwinding the reel 22, the start of the band is fed over the directional roller 18, disposed in its upper position, over the rejecting roller 13 and over the lower driving roller 32 of the driving apparatus. In this working phase, the reel 33, already unwound, is maintained by a laterally introduced spreader winch 39 and is continued to be unwound. The snap set 28 is lowered with the plates 26 and 27 into its lower position. The right portion of the plate 26 abuts then the abutment 30 and is lifted by the latter in the direction of the arrow 27a, so that the carrying roller 24 assumes a higher position than the carrying roller 23.

In the working phase shown in FIG. 3, the reel 33 is completely removed and the spreader winch 39 has been laterally rolled out. The lower drive roller 32 has gripped the start of the band of the reel 22 during its upward movement, which reel 22 now, after lifting the reel opener 11, by lifting the roller 8, is fed to the second working station over the table 21, where it remains above the higher disposed carrying roller 24. By lifting the snap set 28, the reel 22 is then brought into the position, in which the reel 33 is shown in FIG. 1.

In the embodiment shown in FIG. 4, the first working station consists of a table 41 which is rollable horizontally on the rails 40 by means of rollers 42 and 43. The table 41 is equipped with a hydraulic lifting device comprising substantially a pressure cylinder 44, the piston of the lifting device carrying the upper portion 45 of the table 41, on which the carrying rollers 46 and 47 are arranged. The roller 49 is pivotally connected to the upper portion 45 of the table 41 by means of a swingable lever 48, which roller 49 comes into engagement with the periphery of the reel 22' upon rolling off the reel 22' on the rollers 46, 47. By this arrangement, a springing up of the reel 22' during the opening thereof, by means of the reel opener 50, which is swingable above the reel 22' about a bolt 51, is avoided. A Venetian-blind-like table 52 is disposed between the first and the second working stations and can be lowered over a run-off member 53, and over which table 52 the start 54 of the reel 22 is fed towards a driving apparatus consisting of an upper driving roller 31' and a lower

driving roller 32', the latter being liftable and lowerable by means of a hydraulic lifting device 55. The reel 33' is mounted on a laterally rolled-in spreader winch 39', which reel 33' is just unwound.

The operation of this device is as follows:

After the reel 33' is unwound, upon lifting of the lower driver roller 32', the start 54 of the reel 22' is fed to the rolling mill. The table 41 is then run over the rails 40 so far to the right, that the table 41 is disposed below the second working station. By lifting of the reel 22' and lateral rolling-in of the spreader winch 39' into the reel, the latter is then finally brought into the second working position. Then, the table 41 is rolled back again into the first working position and a new reel is mounted thereon.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. An unwinding device for band-shaped rolled goods, particularly for single-way- and cold-rolling mills and working trains, comprising

a first working station and a second working station disposed substantially horizontally adjacent each other,

each of said working stations being adapted to support a reel therein,

said first working station including a reel opener and opening said reel supported in said first working station near its bottom and removing the band from the bottom of said reel substantially horizontally, to be fed to a rolling mill, and

said band of said reel supported at said first working station being fed below and extending at least partly parallel to the band unwinding from the reel supported at said second working station,

a driving apparatus disposed downstream after said second working station, so that upon run-out of said band in said second working station the start of the band of the reel supported in said first working station is joined with the end of the band of the reel supported in said second working station and is fed to a rolling mill in a continuous manner.

2. The unwinding device, as set forth in claim 1, wherein

said first working station comprises two carrying rollers, means for lifting and lowering, respectively, said carrying rollers independently from each other, and means for rotating said carrying rollers.

3. The unwinding device, as set forth in claim 1 wherein

said reel opener comprises a lever swinging about an axis parallel to the rotating axis of said reels, and a slotting tool secured to the free end of said lever.

4. The unwinding device, as set forth in claim 1, wherein

said second working station comprises a table, means for lifting and lowering, respectively, said table, and

two carrying rollers mounted on said table and supporting rotatably said other of said reels.

5. The unwinding device, as set forth in claim 4, which includes

a plate disposed between said table and said carrying roller and swingably mounted on said table.

6. The unwinding device, as set forth in claim 4, which includes

a run-off device disposed above said table and rollable laterally into its operative position.

7. The unwinding device, as set forth in claim 1, wherein

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said driving apparatus comprises an upper roller and a lower roller, and includes means for lifting and lowering, respectively, said lower roller.

8. The unwinding device, as set forth in claim 1, where- 5
in

said first working station comprises a table horizontally movable to said second working station, and means for lifting and lowering, respectively, said table.

9. The unwinding device, as set forth in claim 1, which 10
includes

means preventing the springing-up of said one of said reels in said first working station.

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