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(71) Applicant: **Inoxfil S.A.**

08700 Igualada (Barcelona) (ES)

(72) Inventor: **Alvarez Hernandez, José**

08700 Igualada (Barcelona) (ES)

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(74) Representative: **Gonzalez Vacas, Eleuterio**

Calle Sagasta, 4

28004 Madrid (ES)

(54) **Mechanism for unwinding a wire from a roll packed inside a container**

(57) Specifically conceived for hardened wires, which up to now require an inverse torsion during the forming of the roll designed to compensate the torsion generated during the unwinding process, it is structured around a fixed platform (5), fitted with an ample central circular hole (6), under which is installed a movable platform (7) capable of rotating freely over the fixed platform (5), facing the hole (6), over the movable platform (7) being mounted a pair of wheels (11) and (12) which

press and guide the outgoing wire (18) and are forced to rotate as a result of the longitudinal movement of the wire, one of said wheels (11) transmitting its rotation to a pinion (15) that meshes onto a circumferential rack (16) in the fixed platform (5), so that the longitudinal movement of the wire (18) causes the movable platform (7) to rotate, thus generating a torsion effect on the wire (18) contrary to the natural torsion that occurs during the unwinding process.

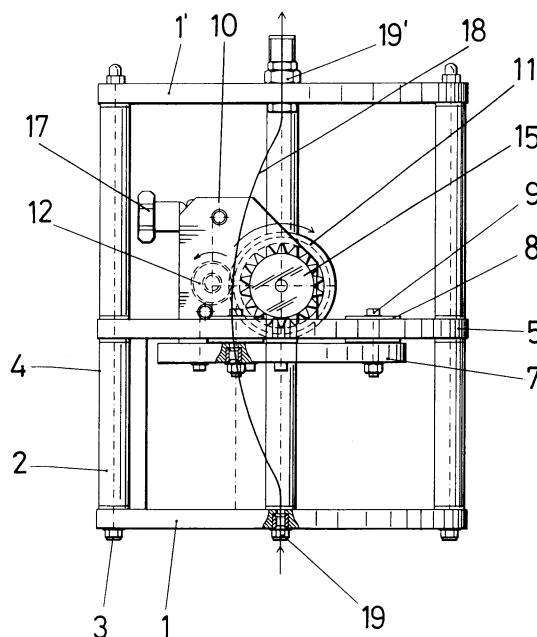


FIG. 1

EP 1 068 908 A2

Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a mechanism specially conceived for unwinding, without intercrossing, the spires of a wire element in the form a roll previously packed in a cylindrical or polygonal container.

[0002] More specifically, the mechanism was conceived for wire elements packed torsion-free inside a container, and is particularly suitable for hardened wires.

BACKGROUND OF THE INVENTION

[0003] One of the standard forms of marketing a rolled wire element consists in packing the roll in a container of a cylindrical or prismatic-polygonal shape from which the wire is subsequently extracted by pulling from one of its ends.

[0004] Wire elements may be classified into two large groups, namely annealed wire and hardened wire.

[0005] Annealed wires are supplied in their maximum softened condition, so that, because of their nature, no internal stresses are accumulated save for those generated by the formation of the spires inside the roll container. These wires are unwound by pulling upwards from the end of the wire, the wire pulling equipment being fitted with a safety device designed to stop the process in the event that the spires become intercrossed. Because of the low resistance from the wire, reasonably fluid direct unwinding is possible.

[0006] In the case of hardened wires, a heat treatment or wire drawing process provides their hardened condition. When the wire is packed in a container, the material's internal stress is added to the spire forming stress.

[0007] To achieve proper unwinding, an equipment has been devised and marketed which introduces the wire in the container with an inverted torsion in respect to that adopted by the wire when extracted from the container, whereby the effect is compensated, thus providing a fluid supply of wire. In order to prevent the intercrossing of the spires which are about to exit, the roll is secured by means of a cover normally made of plastic.

[0008] This inverse torsion in hardened wires is necessary to prevent the wire from rotating 360° on its axis as each spire is extracted from the container. These rotations accumulate stresses in the wire which ultimately lead to intercrossing of the spires, impairing a continuous unwinding operation. The wire is all the more sensitive to this phenomenon the higher its resistance to traction.

[0009] The only solution to this problem, namely to avoid the intercrossing of the spires of a hardened wire which has not been submitted to an inverse torsion at the time of forming the roll, consists in rotating the container in the direction opposite that in which it is being unwound, involving a substantially complex operation in

view that no means are available in the market for this maneuver; thus, practically all types of hardened wires are presently marketed with an inverted torsion in order to avoid problems to the user.

[0010] However, the inverted torsion is not a sufficiently reliable means of preventing the spires from frequently becoming intercrossed; furthermore, the higher cost involved in this operation must be considered, i.e. twisting the wire in the opposite direction.

DESCRIPTION OF THE INVENTION

[0011] The mechanism proposed by the invention solves the above problems in a fully satisfactory manner, allowing hardened wires to be marketed that need not be submitted to inverse torsion and which do not generate an intercrossing of the spires at the time of unwinding the wire for consumption.

[0012] Toward this end, and more specifically, this mechanism is formed on the basis of a frame which constitutes a direct support for a fixed platform shaped like a circular crown that is fitted with an ample central hole and a circumferential alignment of small orifices located over the upper base adjacent the central hole, these small orifices being distributed in equal angles to constitute a kind of rack which meshes with a gear rotating on a shaft perpendicular to said platform, to which shaft is integrally adhered a wire guide and pulling wheel, the support for said transverse shaft, and consequently the support for said wheels and pinion, being mounted over a rotating platform fitted with grooved wheels on vertical shafts through which the movable platform relates to the fixed platform, specifically by coupling the wheel grooves to the edge of the ample central hole in the fixed platform, so that the latter can rotate freely in respect to the movable platform.

[0013] Said wheel mounted on the movable platform is assisted by a second wheel contributing to the guiding of the wire, which second wheel is likewise mounted on said rotating platform and is preferably fitted with a tension member for adjusting the tension of one wheel over the other while the wire runs between them.

[0014] The structure thus described is complemented with two guide bushings located on the lower and upper end zones of the frame, defining the work zone established by said two wheels which conveniently channel the wire during the unwinding operation.

[0015] According to this structure, the mechanism is intended to be positioned above the wire roll container, with the wire passing through the frame's lower guide bushing, the intermediate pair of wheels and the upper guide bushing, whereby, upon pulling on the wire during the unwinding operation, the pressure or nipping effect provided by the guide wheels causes them to rotate, so that one of them, associated to the pinion shaft, transmits rotation to the pinion and this movement subsequently turns into a planetary movement of the overall rotating platform as a result of the rack acting on the

pinion, equivalent to a twisting motion of the wire on itself while unwinding, so that, by means of an adequate design of the complementary pinion and rack, the 360° rotation of the movable platform is made to coincide with the passage of a wire spire through the mechanism, whereby said mechanism compensates the twisting effect of the wire during the unwinding process, thus eliminating the torsion and consequently the risk of the spires becoming intercrossed.

DESCRIPTION OF THE DRAWINGS

[0016] In order to complement this description and help toward a better understanding of the characteristics of the invention according to a preferred example of a practical inventive embodiment, a set of drawings is attached hereto and forms an integral part of the description, the following being represented in an illustrative and non-limiting character:

[0017] Figure 1 shows a schematic side elevation view of a mechanism for unwinding a wire roll packed inside a container, as embodied according to the object of the present invention.

[0018] Figure 2 shows a plan view of the assembly shown in the preceding figure.

PREFERRED EMBODIMENT OF THE INVENTION

[0019] In the light of these figures, the manner in which the mechanism being advocated is seen to be structured over a lower base (1) and an upper base (1') with the aid of threaded rods (2) and their corresponding nuts (3) and spacers (4), designed to stabilize, at a medium level, a fixed platform (5) which, as shown particularly in Figure 2, adopts the form of a circular crown defining an ample central circular hole (6).

[0020] Immediately under the fixed platform (5) is located a rotating platform (7), which in the present case is fitted with three grooved wheels (8) which rotate freely and are installed in equal angles distributed along the platform periphery with the help of shafts (9) that are perpendicular to the platform in an ascending position over the free rotating wheel (8) shafts, said wheels coupling along their grooved profile onto the internal edge of the fixed platform (5), namely the edge established by the central hole (6), whereby the movable platform (7) is able to rotate freely in respect to the fixed platform (5), as previously discussed.

[0021] Over the movable platform (7), within the fixed platform central hole (6) and with the help of adequate supports (10), are also mounted two freely rotating wheels (11) and (12), specifically over respective shafts (13) and (14), the shaft (13) of the larger diameter wheel (11) extending above the fixed platform (5) and ending in a pinion (15) which meshes with a circumferential rack (16) defined by an alignment of small orifices distributed at equal angles over the upper face of the fixed platform (5) and adjacent the central hole (6), the shaft (14) cor-

responding to wheel (12) being assisted by a tension member (17) designed to adjust the pressure at which the wheels (11) and (12)

contact each other and between which passes the wire (18) to be unwound, which then proceeds through the frame's lower base (1) and a guide bushing (19), between the wheels (11) and (12), through the upper base (1') and a further guide bushing (19'), as can be seen particularly in Figure 1.

[0022] According to this structure and as previously discussed, when the wire (18) is being pulled during the unwinding of the roll in the container under the frame, passage of said wire (18) between the wheels (11) and (12) causes the wheels to rotate, this rotation being transmitted through the shaft (13) to the pinion (15), which is thus forced, by its own rotation, to acquire a planetary movement over the rack (16) and to cause the movable platform (7) to rotate jointly with all its associated elements, consequently making the wire (18) to twist inversely in respect to the torsion caused by the effect of the unwinding, one torsion compensating the other and thus becoming annulled.

[0023] The mechanism in question is applicable to all kinds of metal and ferric or non-ferric alloy wire rolls, the wire diameters ranging from 0.5 mm to 2 mm, and also applicable, as previously discussed, to hardened wires in which the torsion caused by the unwinding constitutes a problem.

Claims

1. A mechanism for unwinding a wire roll packed inside a container, conceived particularly for hardened wires for the purpose of avoiding the spires from intercrossing upon leaving the container during the unwinding of the roll, without applying a previous compensating inverse torsion while forming the roll, characteristic in that it is constituted by combining a fixed platform (5) and a movable platform (7), the former having an annular shape and over which is rotationally mounted the latter, the movable platform (7) conveniently incorporating a pair of wheels (11) and (12) facing each other which form a guide for the wire (18) being pulled out of the container during the unwinding of the roll, which wheels are mounted to rotate freely on the movable platform (7), one wheel (11) being integral, via its own shaft (13), to a pinion (15) that meshes with a circumferential rack (16) defined by a likewise circumferential alignment of small orifices established over the fixed platform (5) adjacent an ample central hole (6) through which emerge the mechanisms associated to the movable platform (7), in a manner that the longitudinal movement of the wire (18) during the unwinding process causes said pinion (15) to rotate on its shaft (13), said rotation in turn producing a planetary movement of the pinion (15) over

the rack (16), causing the movable platform (7) itself to rotate in respect to the fixed platform (5) to the extent that an inverse torsion contrary to the natural torsion that occurs during the unwinding of the wire when leaving the roll is generated in the wire (18). 5

2. A mechanism for unwinding a wire roll packed inside a container, according to claim 1, characteristic in that the movable platform (7) is fitted with at least three grooved wheels (8) mounted to rotate freely over respective shafts (9) perpendicularly associated to said platform (7), which grooved wheels (8) operate on the edge of the central hole (6) of the fixed platform (5) in a manner that the latter constitutes a means of support for the movable platform (7) and provides it with the capacity to rotate freely. 10 15
3. A mechanism for unwinding a wire roll packed inside a container, according to the preceding claims, characteristic in that the pair of wheels (11) and (12) which constitute the guide means for the wire (18) are mounted over the movable platform (7) with the help of a supporting element (10) fitted with a tension member (17) designed to adjust the pressure with which one of the wheels (12) presses the cable (18) against the other wheel (11) in order to ensure that the rotating movement of said wheels resulting from the passage of the wire (18) corresponds to the longitudinal movement of the wire. 20 25 30
4. A mechanism for unwinding a wire roll packed inside a container, according to the preceding claims, characteristic in that the fixed platform (5) is mounted in the intermediate zone of a frame comprising a lower base (1) and an upper base (1') that are centrally fitted with respective guide bushings (19, 19'), in a manner that the wire (18) leaving the container under said frame passes through the lower guide bushing (19), between the pair of wheels (11, 12) and finally through the upper guide bushing (19), toward the wire pulling zone. 35 40
5. A mechanism for unwinding a wire roll packed inside a container, according to the preceding claims, characteristic in that said frame is formed by said bases (1, 1') attached to each other by means of threaded rods (2) and their corresponding nuts (3), the rods being fitted with spacer tubes (4) which conveniently immobilize the fixed platform (5), through which said rods (2) also pass. 45 50

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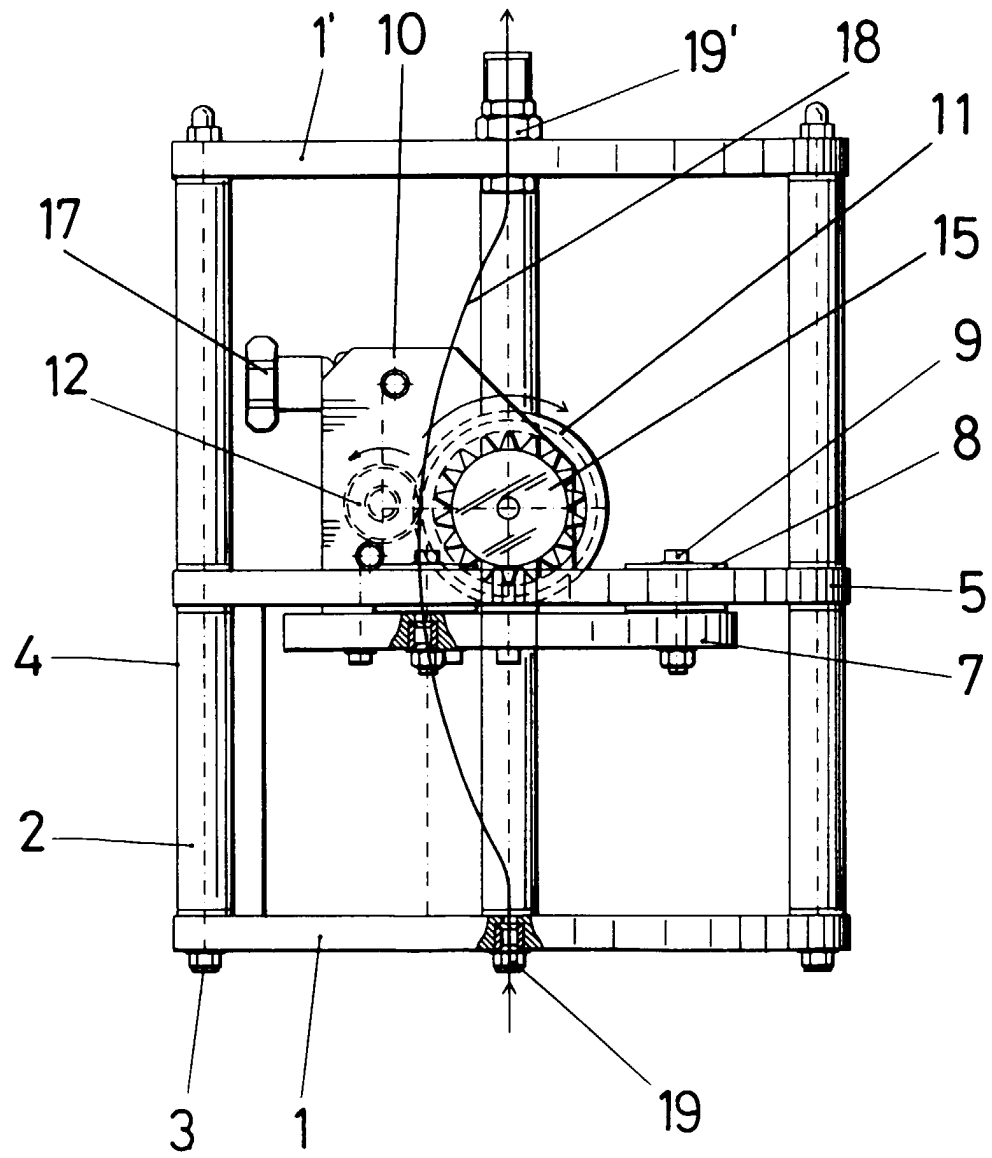


FIG. 1

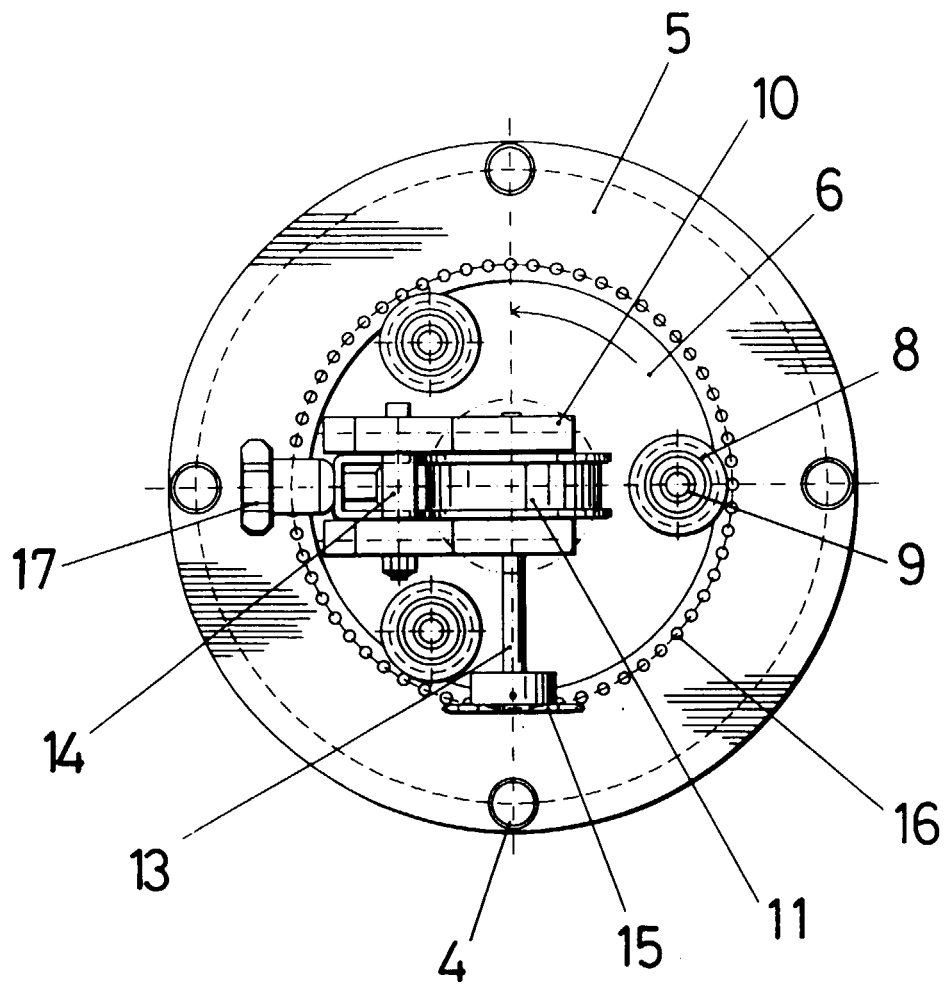


FIG. 2