

Title (en)

Machine for making helical springs.

Title (de)

Maschine zur Erzeugung von Schraubenfedern.

Title (fr)

Machine pour la fabrication de ressorts hélicoidaux.

Publication

**EP 0160174 A2 19851106 (DE)**

Application

**EP 85102219 A 19850228**

Priority

DE 3416110 A 19840430

Abstract (en)

1. A machine for the production of coil springs (10) each of which is shaped from a piece of wire and has at its free ends end turns (11) which are bent to an approximate U-shape and over lie one another as seen in the direction of the axis of the spring (17), wherein the machine comprises several processing stations (177 to 178, 200) and a spring annealing station (180) in a circular arrangement and furthermore a turntable (181) comprising gripper arms (182 - 185) with gripper claws (187) arranged thereon in a radial direction, wherein starting from a spring winding station (177), a coil spring (10) initially unshaped at the ends is grasped by the gripper claws (187) of a gripper arm (182 - 185) and is fed in timed sequence to several processing stations (177 to 178, 200), as well as to the spring annealing station (180), where the end turns (11) are formed on the coil spring (10), characterized in that after the spring winding station (177) in the direction of rotation, a first bending station (178) for the one end turn (11) and, positioned opposite a second similar bending station (178) for the other end turn (11) are synchronously provided, and the bending stations (178, 178) have a central member (66) formed in a U-shape wherein several bending tools (74, 70, 78), displaceable in radial direction with respect to the central member (66), are provided, with recesses in the central member (66) and the bending tools corresponding to the bending points (5 - 8) on the end turns of the coil spring and furthermore a retainer (23) bears on the outer periphery of the central member (66), and that the spring annealing station (180) is connected after the second bending station (179) in the direction of rotation (Figures 3a, 3b, 4).

Abstract (de)

Die Maschine zur Erzeugung von Schraubenfedern besteht aus einer Transportvorrichtung, bei der an radialen drehbar angetriebenen Greiferarmen jeweils eine Schraubenfeder an vorderen Klauen eingeklemmt ist und die Greiferarme derart angetrieben sind, daß die Schraubenfedern nacheinanderfolgend taktweise eine Reihe von in Drehrichtung der Greiferarme hintereinanderliegenden Bearbeitungsstationen zugeführt wird. Eine Bearbeitungsstation ist die Federwindestation und eine nachgeschaltete, weitere Bearbeitungsstation eine Federglühstation. Die beiden Endwindungen der Schraubenfeder werden in einer hinter der Federwindestation angebrachten Biegestation annähernd U-förmig mit mehreren, einen gegenseitigen Abstand aufweisenden Biegestellen versehen. An die erste Biegestation schließt sich eine zweite, gleiche Biegestation für die gegenüberliegende Endwindung der Schraubenfeder an. Nach Durchlaufen der Federglühstation werden die fertiggestellten Schraubenfedern in einer Federdrehstation ausgerichtet und einer Federmontagemaschine zugeführt.

IPC 1-7

**B21F 35/02**

IPC 8 full level

**B21F 3/027** (2006.01); **B21F 27/16** (2006.01); **B21F 33/04** (2006.01); **B21F 35/00** (2006.01); **B21F 35/02** (2006.01)

CPC (source: EP)

**B21F 35/02** (2013.01)

Cited by

GB2345047A; GB2345047B; WO9637320A1

Designated contracting state (EPC)

DE FR GB IT

DOCDB simple family (publication)

**EP 0160174 A2 19851106**; **EP 0160174 A3 19871021**; **EP 0160174 B1 19890802**; AU 4055485 A 19851107; AU 566780 B2 19871029; CA 1263070 A 19891121; DE 3416110 A1 19851107; DE 3416110 C2 19861002; DE 3571944 D1 19890907; ES 286293 U 19851101; ES 286293 Y 19860601; JP H0129611 B2 19890613; JP S6130247 A 19860212; MX 161118 A 19900731; ZA 851969 B 19851127

DOCDB simple family (application)

**EP 85102219 A 19850228**; AU 4055485 A 19850401; CA 475930 A 19850307; DE 3416110 A 19840430; DE 3571944 T 19850228; ES 286293 U 19850424; JP 9213685 A 19850426; MX 20475385 A 19850327; ZA 851969 A 19850315