



(86) Date de dépôt PCT/PCT Filing Date: 2002/01/22
(87) Date publication PCT/PCT Publication Date: 2002/07/25
(85) Entrée phase nationale/National Entry: 2003/07/18
(86) N° demande PCT/PCT Application No.: PL 2002/000003
(87) N° publication PCT/PCT Publication No.: 2002/058082
(30) Priorité/Priority: 2001/01/22 (P-345370) PL

(51) Cl.Int.⁷/Int.Cl.⁷ H01B 15/00

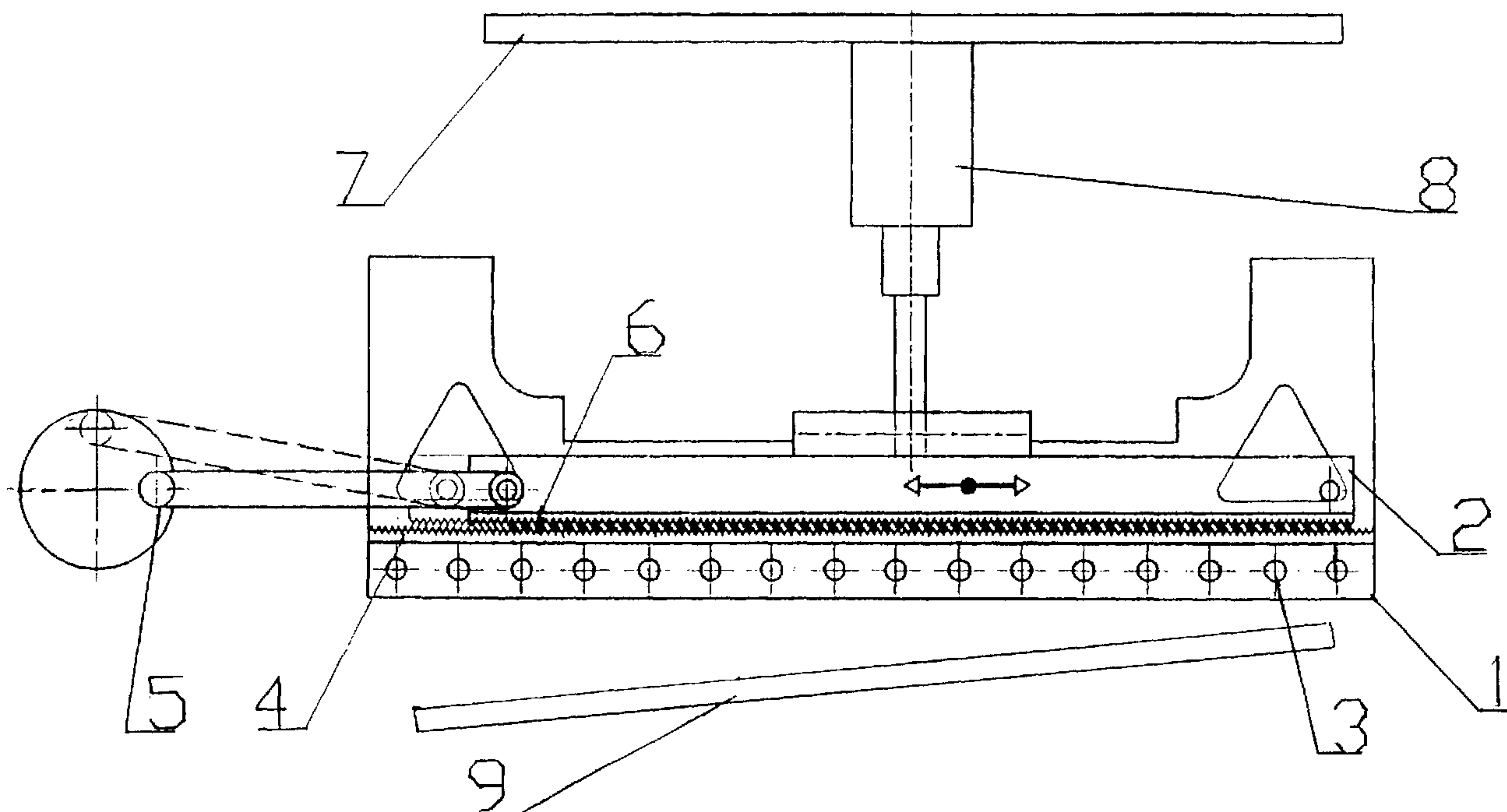
(71) Demandeurs/Applicants:
MARASZEWSKI, JAN, PL;
MARASZEWSKI, WITOLD, PL;
PLATA, BRONISLAW, PL;
PLATA, KAZIMIERZ, PL

(72) Inventeurs/Inventors:
MARASZEWSKI, JAN, PL;
MARASZEWSKI, WITOLD, PL;
PLATA, BRONISLAW, PL;
PLATA, KAZIMIERZ, PL

(74) Agent: OGILVY RENAULT

(54) Titre : PROCEDE ET APPAREIL POUR LA RECUPERATION DE MATERIAUX A PARTIR DE CABLES
D'INSTALLATION AVEC DE MULTIPLES CONDUCTEURS

(54) Title: PROCESS AND APPARATUS FOR RECOVERING MATERIALS FROM INSTALLATION CABLES WITH A
BUNCHED CONDUCTOR



(57) **Abrégé/Abstract:**

The present invention relates to a process for recovering materials from installation cables with bunched conductors and plastic insulation. The process is characterised in that the installation cable is cut into segments which are, after pressing down, rolled at an increased temperature ranging from 70 ° to 130 °C, while maintain during rolling the position of the longitudinal axis of segments, which is perpendicular to the direction of motion, and next the separated conductor segments are separated from insulation and non-separated cable segments which are again subjected to the recovery process. The present invention relates further to the apparatus provided with a separating sieve (9), which comprises the segments comprising a lower plate (1) and an upper plate (2) associated with a connecting-rod mechanism (5), a pressing servo-motor (8), and a separating sieve (9) arranged under it in an angular manner.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



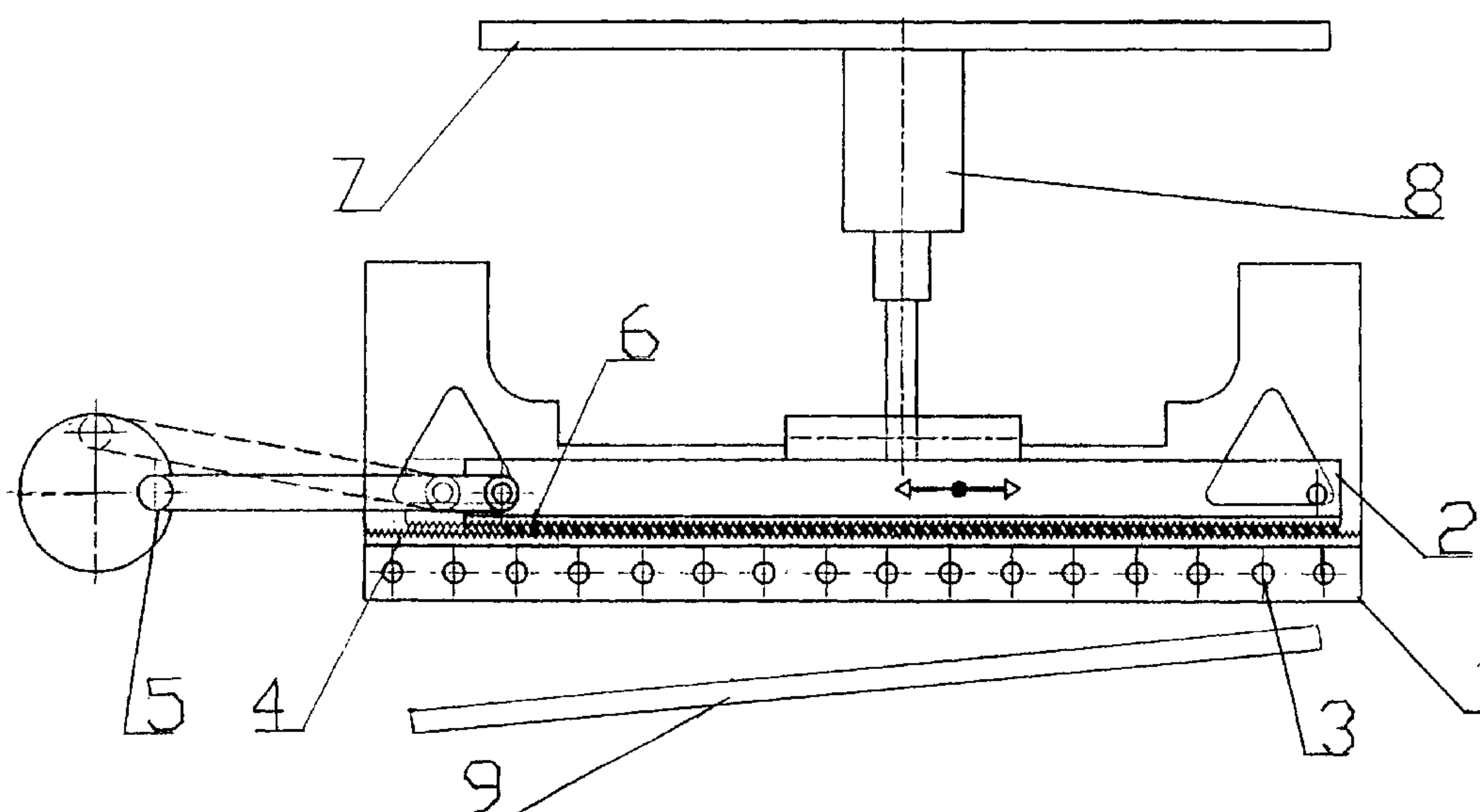
(43) International Publication Date
25 July 2002 (25.07.2002)

PCT

(10) International Publication Number
WO 02/058082 A1

- (51) International Patent Classification⁷: **H01B 15/00** (74) Agent: **MICHALSKI, Witold**; Polservice Sp. z o.o., P.O. Box 335, PL-00-950 Warszawa (PL).
- (21) International Application Number: PCT/PL02/00003
- (22) International Filing Date: 22 January 2002 (22.01.2002) (81) Designated States (*national*): CA, CZ, HU, JP, SK, US.
- (25) Filing Language: English (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).
- (26) Publication Language: English
- (30) Priority Data:
P-345370 22 January 2001 (22.01.2001) PL
- (71) Applicants and
(72) Inventors: **MARASZEWSKI, Jan** [PL/PL]; Mordarka 415, PL-34-600 Limanowa (PL). **MARASZEWSKI, Witold** [PL/PL]; Mordarka 415, PL-34-600 Limanowa (PL). **PLATA, Kazimierz** [PL/PL]; Wysokie 26, PL-34-600 Limanowa (PL). **PLATA, Bronislaw** [PL/PL]; Wysokie 26, PL-34-600 Limanowa (PL).
- Published:**
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS AND APPARATUS FOR RECOVERING MATERIALS FROM INSTALLATION CABLES WITH A BUNCHED CONDUCTOR



(57) Abstract: The present invention relates to a process for recovering materials from installation cables with bunched conductors and plastic insulation. The process is characterised in that the installation cable is cut into segments which are, after pressing down, rolled at an increased temperature ranging from 70 ° to 130 °C, while maintain during rolling the position of the longitudinal axis of segments, which is perpendicular to the direction of motion, and next the separated conductor segments are separated form insulation and non-separated cable segments which are again subjected to the recovery process. The present invention relates further to the apparatus provided with a separating sieve (9), which comprises the segments comprising a lower plate (1) and an upper plate (2) associated with a connecting-rod mechanism (5), a pressing servo-motor (8), and a separating sieve (9) arranged under it in an angular manner.



WO 02/058082 A1

Process and apparatus for recovering materials from
installation cables with a bunched conductor

The present invention relates to a process for recovering materials from single-core installation cables, the core being made of non-magnetic material and plastic insulation. The present invention relates further to a construction of an apparatus desired for implementing the process.

It is known a Swedish process for recovering copper from cables with plastic insulation, comprising grinding the whole conductor, followed by separation of a product obtained in a separator. Copper obtained by this process as a powder allows to recover up to 60% copper brought to the recovery process.

Other process known *inter alia* from the Polish application of the utility model No 91974 consists in separation of the insulation from metal conductors by means of a knife arranged in a groove of the guide roll. In addition there is a scraper mounted at the roll. The knife is arranged at a pin through the torsional arm coupled with a control mechanism. The process is not

suitable for bunched installation conductors due to easy damage of a core.

It is the object of the present invention to provide a process for recovering materials from installation cables with a bunched conductor, with recovery ratio which exceeds results obtained till now, as well as an apparatus for carrying out the process.

The process for recovering materials from installation cables with a bunched conductor consists in cutting the installation cable into segments and, after holding down, rolling them at an increased temperature ranging from 70° to 130°C while maintaining, during rolling, a segment arrangement perpendicular to the movement direction, followed by separation of the recovered segments from non-separated cable segments, which are again subjected to the recovery process.

It is preferred to roll the segments of the installation cable between elements with an increased coefficient of friction.

The apparatus for recovering materials from installation cables with a bunched conductor and plastic insulation, provided with a separating sieve, presents segments comprising a lower plate and an upper plate associated with a mechanism to impart a reciprocating motion, as well as a pressure servo-motor, and a separating sieve arranged under it in an angular manner, the segments being connected each other with a frame.

It is preferred to provide the lower plate with a heating element as well as to make on its upper surface cross notches.

It is also preferred to make on the lower surface of the upper plate notches in form of grooves in the direction perpendicular to its direction.

It is also preferred to provide a mechanism as a connecting-rod system to impart a reciprocating motion.

Providing a new process for recovering materials from installation cables with bunched conductors has increased recovery of metal to more than 90%. Metal obtained by this method is of technical purity and suitable to reprocessing with no additional measures. The insulation obtained by this technology is also an intermediate product for reprocessing.

The apparatus for recovering materials from installation cables is illustrated in the drawing in a side view.

Implementation of the inventive process begins with cutting the installation cable into segments. Subsequently, the segments are thrown into a movable drawer provided with a bottom to be opened. The drawer thus prepared is inserted into the apparatus for recovering, wherein the drawer bottom is opened over the lower plate 1, and the cable segments are dumped onto the exactly limited surface of the plate. After removing the drawer the upper plate is pressed down and put in a to-and-fro motion. The segments are rolled at the increased temperature ranging from 70° to 130°C, and at the increased

coefficient of friction between the plates 1 and 2. Both factors give rise to thermal expansion of the insulation, and an appropriate pressing down of the upper plate 2 makes it possible to execute a complex motion by the cable segments, during which the bunched conductor falls out of the horizontally arranged segments. The next operation consists in raising the upper plate and shifting the scraper which displaces separated conductors, insulations and non-separated segments to the sieve to pass the separated parts of the conductor from non-separated parts and insulation, fromwhere they pass to the next process at the lower stage of the apparatus.

The apparatus for recovering materials from the cables presents a lower plate 1 and upper plate 2, which accomplish a translatory motion with respect to each other. In the lower plate there is provided a heating element 3, whereas on its upper surface 4 cross notches are made.

The upper plate 2 is associated with a connecting-rod mechanism 5. On the lower surface of the upper plate 2, there are groove notches in the direction perpendicular to that of the reciprocating motion, and the pressing servomotor 8 is fixed to the frame 7 over the upper plate 2.

Under the lower plate 1 there is arranged in an angular manner the separating sieve 9, through which separated and non-separated cable segments are displaced.

Claims

1. Process for recovering materials from installation cables with bunched conductors and plastic insulation, characterised in that the installation cable is cut into segments, which are, after pressing down, rolled at an increased temperature ranging from 70° to 130°C, while maintaining during rolling the position of the longitudinal axis of segments, which is perpendicular to the direction of motion, and next the separated conductor segments are separated from insulation and non-separated cable segments which are again subjected to the recovery process.

2. Process according to claim 1, characterised in that the rolling of installation cable segments occurs between elements of an increased coefficient of friction.

3. Apparatus for recovering materials from installation cables with bunched conductors and plastic insulation, provided with a separating sieve, characterised in that it presents segments comprising a lower plate (1) and an upper plate (2) associated with a mechanism (5) to impart a reciprocating motion, a pressure

servo-motor (8), and a separating sieve (9) arranged under it in an angular manner.

4. Apparatus according to claim 3, characterised in that the lower plate (1) is provided with a heating element (3), and has on its upper surface (4) cross notches.

5. Apparatus according to claim 3, characterised in that the upper plate (2) is movable and has on its lower surface (6) groove notches in the direction perpendicular to that of motion.

6. Apparatus according to claim 3, characterised in that the mechanism (5) to impart a reciprocating motion, is formed by a connecting-rod

1/1

