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(54) Transmission cable for kinematic chain.

(57) A transmission cable for kinematic chain, whose purpose is to provide these units, with an external diameter of approximately 1.5 to 3 mm., with high tensile strength, minimum elongation and great flexibility, as well as a minimum friction coefficient. To achieve this, the core (1) is composed of nineteen wires, with a central wire (5) surrounded by six others (6) and these, in turn, by another twelve (7), with each group spirally arranged, and with eight cords or yarns (3), each made up of seven wires, around the previously mentioned outer group, and with the exterior of this casing having the wires in a coaxial direction with the axis of the cable.

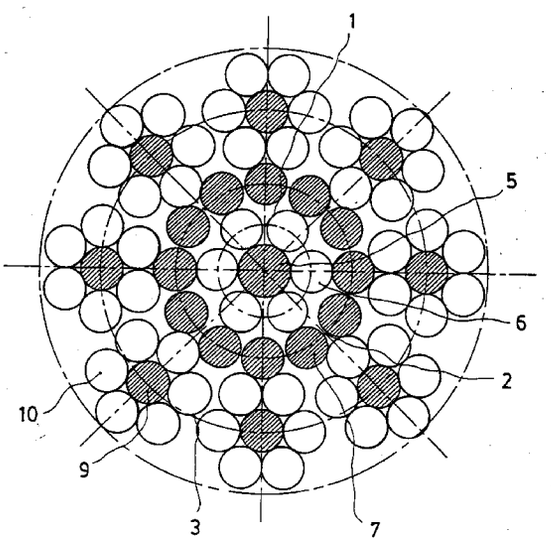

Fig.:1

EP 0 597 799 A1

The invention deals with a transmission cable for kinematic chains, of either the open or closed type, used for moving masses or elements in machines, for example in domestic appliances or automotion, which require high ten sile strenght, minimum elongation or stretching, maximum flexibility and a low friction coefficient, given that these cables have to travel along fixed guides and tracks, pulleys or be coiled or wound on drums or reels of small diameters, on which they are submitted to a high number of alternate flexions as a result of the possible frequent changes in their direction of movement.

Therefore, the tensile strength of a transmission cable is provided in terms of the composition of the steel used in the manufacture of the constituent wires, as well as the diameters adopted and their number. Elongation on the part of these is the consequence of the arrangement of the wires that make up the core and of the spiral braiding, pitch and direction or rotation given to the wires.

In the same way, flexibility is in terms of the degree of surface finish of the wires, of the lubrication employed and of the specific way in which the cords or yarns are braided over the core. It also depends on the pitch and the direction of rotation of its spirals and their arrangement over the base core.

The friction coefficient which is presented by slippage or creepage is in terms of the direction taken externally by the component wires of the outer cords.

In those transmission cables which are known, these ideal characteristics are still far from being achieved, since they are not found in existing elements on the market incorporated into mechanisms of this kind.

The basic object of the invention, therefore, is to obtain optimum characteristics for the properties of transmission cables.

To achieve these objectives, the invention opts for a polygonal cross-section profile made up of circular cross-section elements, arranged in such a way and number that, as a result, they provide a practically circular transversal cross-section for diameters between 1.5 and 3 mm., with the cable being made of strands of steel wire, which, by following the arrangement shown, achieve the foreseen objective.

The direction taken by the outer cords coincides with the direction of the cable axis, a condition which is obtained by the spiral pitch adopted and the direction of rotation in relation to those given or the corresponding previous ones.

The cable acording to the invention is a steel cable composed of a total of seventy-five stell wires, arranged with a central core formed by a coaxial wire, around which six wires are wound as a first sheath or casing and, over this, a second casing of twelve perfectly braided wires.

On top of this second casing, eight cord or yarns are wound, each composed of a core and six wrapping wires, also apirally wound around their core.

The direction of winding of the different spirals, in each of the casings considered, as well as that of the outer cords, is combined in such a way that the latter have an outer coaxial arrangement with the axis of the cable.

As a result of the tests and experiments carried out, it has been found that a cable constructed in accordance with this standard perfectly fulfils the requirements and objectives set down at the beginning of this specification.

The invention is illustrated on the two sheets of drawings which are enclosed herewith and which show the following:

- Figure 1 represents a cross-sectional elevation of the cable.
- Figure 2 represents an external view of the cable with the different winding casings.

Looking now at Figure 1, we can see the whole of the cable cross-section around the central core (1), made up of a coaxial wire (5), over which six wires (6) are wound spirally. Over this core (1) a second sheath or casing (2) is situated, based on twelve wires (7) also suitable spirally wound.

The exterior of this second sheath or casing is to be found receiving a group of eight cords (3), each of which is made up of a core (9) and six casing wires (10), also spirally wound.

According to Figure 2, we can see this arrangement in a vertical perspective cut according to each casing layer, starting from the central coaxial wire (5), which receives the wires (6) to form the core (1).

Over the wires (6), the winding of the second sheath or casing (2) can be observed with its wires (7), and on top of this second casing are the eight cords (3), each with its core (9) and casing wires (8).

The outer wires (4) of the cable are placed coaxially to the axis of the cable, which, in short, provides a minimum friction coefficient and high flexibility.

It is important to point out, once having described the nature and advantages of this invention, the non-restrictive character of the same, inasmuch as changes in the shape, material or sizes of this constituent parts will not in any way alter its essentially, as long as they do not mean a substantial variation in the assembly.

Claims

1.- Transmission cable for kinematic chain, applicable to power transmission elements for the movement of masses or elements of machines in open or closed kinematic chains, based on metal wires braided over a central core (1) in successive layers, which is characterized in that it has a core (1) made up of a total of nineteen wires bases on a central wire (5) sur-

rounded spirally by another six wires (6), which, in turn, are surrounded by another twelve wires (7), spirally arranged over the previous ones, in that the external cover or casing of the cable is made up of eight cords or yarns (3), each provi ded with a core wire (9) and six wires (10) around it, making a total of fifty-six wires, in that all the wires in this casing are arranged in a coaxial direction with the longitudinal axis of the cable.

2.- Transmission cable for kinematic chain, in accordance with claim 1, characterized in that the cable is prepared, preferably, for an outer diameter dimension of between 1.5 and 3 mm.

3.- Transmission cable for kinematic chain, in accordance with claim 1, characterized in that the wires are made of high quality high tensile steel with a suita bly lubricated surface finish.

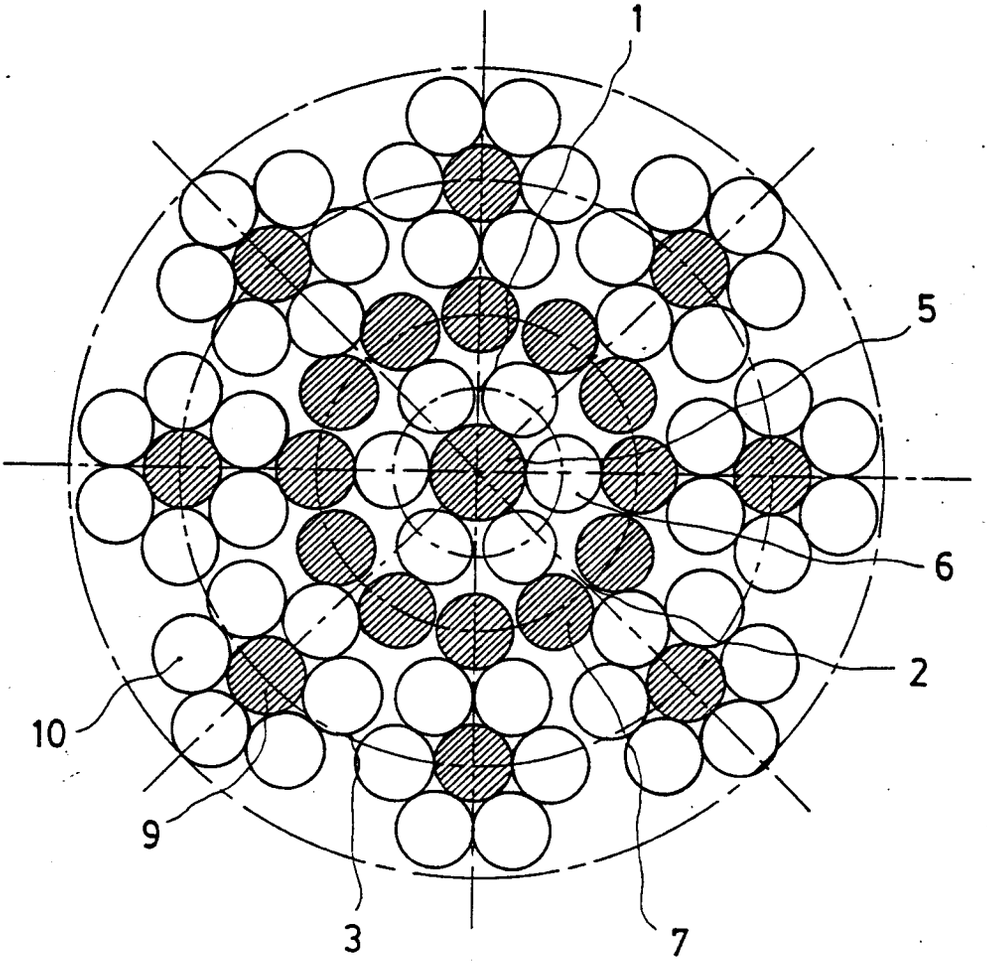

Fig.: 1

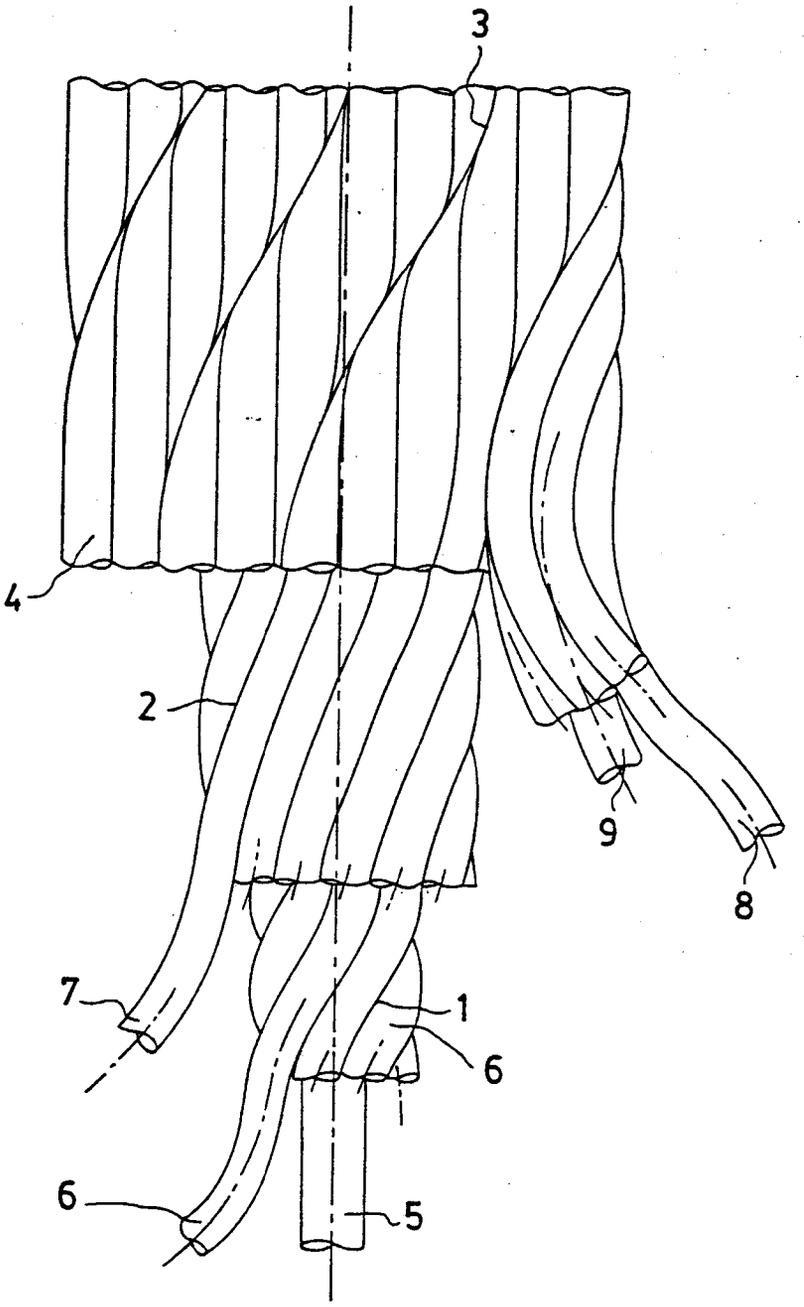

Fig.: 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 50 0132

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	US-A-4 158 283 (M.A.NATION) * figure 3A *	1	D07B1/06
Y	US-A-3 352 098 (W.J.GILMORE) * column 3, line 34 - line 51 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			D07B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	6 January 1994	Goodall, C

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
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