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Applicant: **Abril Cullell, José**
Poligono Industrial "Mata-Rocafonda", s/n
Mataro Barcelona (ES)

Inventor: **Abril Cullell, José**
Poligono Industrial "Mata-Rocafonda", s/n
Mataro Barcelona (ES)

Representative: **Toro Gordillo, Ignacio Maria**
Viriato, 56
E-28010 Madrid (ES)

Improvements introduced in the needle plates of rectilinear knitting machines.

The present invention refers to a series of improvements in the needle plates of rectilinear knitting machines, intended to minimize the wearing effects caused by the needles in said needle plates in the normal operation of the knitting machine, especially with stiff and little elastic yarns.

Specifically they consist in the disposition, on each of the needle plates of the machine, of a longitudinal channel in which it is coupled, with an exchangeable character, a milled ruler on which are established beds for the needles in continuity with those of the rest of the needle plate, being these rulers of a material with a great hardness and being intended to withstand the friction effects produced by the needles in their alternative movement, due to the traction or stretching caused in turn by the stretcher of the fabric.

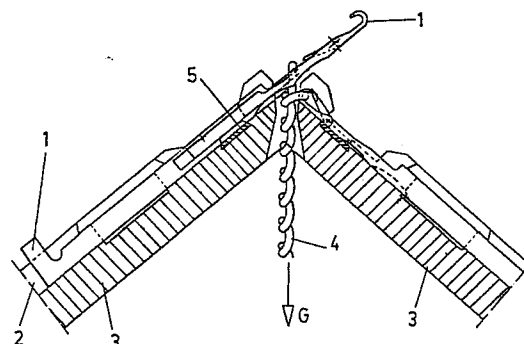


FIG.-1

Description

OBJECT OF THE INVENTION

The present invention refers, as expressed by the title of this specification, to a series of improvements introduced in the needle plates of rectilinear knitting machines, improvements oriented towards the obtention of a further resistance to wearing on the part of said needle plates, before the alternative movement of the needles in their corresponding beds, and especially with the use of new fibers which give rise to very stiff and little elastic yarns and which require a great traction effort on the part of the stretcher of the fabric.

ANTECEDENTS OF THE INVENTION

As it is known, in the needle plates of the rectilinear knitting machines are defined a plurality of channels, slots or beds for said needles, in which these move alternatively in the operational process of the machine. At present, the weaving elements of this type of machines work at the limit of possibilities and wearings allowed, due especially to the use of new artificial fibers and their mixes with natural fibers, which have caused the creation of very stiff and little elastic yarns, to weave a practically infinite range of new samples, possibilities thanks to the incorporation of electronics in the programming of said machines. All of this has caused that the plates or beds of needles of the conventional machines, the main weaving organ of same, suffer a premature wearing not only on the side walls but also in the depth of the slots or beds for the needles, which determinate plays, that cancel the operativity of the machine.

This wearing results very acute in the upper part of the needle plates, as it is here where the slots have a minor section, and is caused by the very movement of the needles which, to reach the utmost uprise, suffer a traction towards the inside of the machine, and downwards, due to the stretching of the very knits or meshes which configure the fabric that is being weaved.

In accordance with this problem, the evident and most adequate solution, in principle, would be the manufacture of the needle plates with a material with a hardness the same or higher than that of the needles. This solution, which may be accepted from the theoretical point of view, results impossible in practice as the manufacture, under the previously stated conditions, of some elements of so much magnitude and complexity as are the needle plates, would imply an increase in costs, so considerable, that it would not be admitted by the market.

DESCRIPTION OF THE INVENTION

With the improvements that the invention proposes, this problem is solved at full satisfaction, not only from the operational point of view, but also from the economic point of view.

Therefor and in a more concrete mode, such improvements consist in the disposition, on each of the needle plates, of a ruler, previously mechanized, through drillings which determine slots coincident,

not only in their section but in their passing or hub, with that of the slots existing in the needle plates of the machine to which such rulers are intended, so that a perfect continuity is established between the slots of the base needle plate and the slots of the complementary ruler.

The material used for the manufacture of these rulers will have the adequate degree of hardness, approximately of a value twice than that of the material used for the manufacture of the needle plates, with which optimal duration and yield are obtained.

Said rulers will be implanted in guides operatively made in the needle plates, in their high area, that is, in that with the greatest wearing.

In accordance with another improvement of the invention, the cited rulers are mounted on their guides with an exchangeable character, for which, before an eventual wearing of same, they can be easily replaced for new ones.

Therefore and in accordance with the improvements preconized it is attained, on one side, the enlargement of the useful life on the needle plates, on minimizing the wearing suffered by same, and on the other, and on reaching such a wearing situation, only the rulers should be changed and not the complete needle plates, as it happens in the conventional machines, with the consequent and favourable repercussion, economic, that this means not only from the point of view of materials or replaced elements in the machine but also from that of labour necessary to carry out such substitutions.

DESCRIPTION OF THE DRAWINGS

To complement the description which is being made and in order to help to a better understanding of the characteristics of the invention, we enclose herewith as an integral part of this specification, a set of drawings in which, with an illustrative and not limitative character, the following has been represented:

Figure 1.- Shows a schematic cross sectional view of the needle plates of a rectilinear knitting machine made in accordance with the improvements object of the invention, in which the needles have been represented in the weaving position and in the utmost uprise position.

Figure 2.- Shows the same view of the previous figure in the position of transfer of mesh.

Figure 3.- Shows a plane view of one of the needle plates, in which it is noted the specific positioning set forth for the complementary ruler, on which the invention is fundamentally centered.

Figure 4.- Shows a cross sectional view of the needle plate shown in the previous figure.

Figure 5.- Shows an extended view of the ruler, which now appears in an isolated mode.

Figure 6.- Finally, shows a profile of said ruler duly coupled in the corresponding slot.

PREFERENT EMBODIMENT OF THE INVENTION

In the previously stated figures and more concretely in figures 1 and 2, it can be seen the needles 1, located on their corresponding channels or beds 2 of the needle plates 3, in their position of utmost uprise which correspond to the weaving and to the transfer respectively. To reach said position, the needles, in their up and down movements, must overcome the resistance offered to such movements by the very fabric, which hangs from them and which is permanently committed to a stretching effect, in a downward sense, concretely in that of the "G" arrows shown in the cited figures 1 and 2, stretching caused by the traction of the stretcher of the fabric, not represented in such figures.

This traction in the downward sense of the fabric 4 has a repercussion, thanks to a vectorial decomposition, in forces in the side walls and in the bottom of the slots or beds 2 for the needles, especially in the extreme higher area of same.

Well then, in this higher area of the needle plates 3 and in accordance with one of the improvements preconized, there is a ruler 5, duly drilled, so that in same are established slots 6 which set forth a perfect continuity with the slots 2 of the needle plates 3, not only on which refers to their bottom 6 but also to their side walls 7-7'.

This ruler 5 will be obtained in a material considerably harder than that which participates in the structuration of the needle plates 3, with which said ruler 5 will be the one to support practically in total the effects of the friction of the needles 1 in their alternative movement along the slots or beds 2-6, supporting these wearing effects, not only their bottom 6 but also their side walls 7-7' during a time considerably longer than that which a conventional needle plate is able to stand, as said rulers 5 are obtained on basis of a material with a great hardness.

On the other side, it has been provided that the rulers 5 as observed with full clearness in the view of figure 6, adopt a dovetail profile which allows an utmost easy and simple mounting in the corresponding needle plate 3, concretely on a guide 8 provided to that purpose in same, and with a complementary section, being unmovably fastened in longitudinal sense with the cooperation of fastening pins 9 which pass through the holes 10 set forth at the ends of said rulers 5.

On the longitudinal view of figure 3 it can be noted the positions of weaving and transfer for the needles 1, concretely that of weaving to the left and of transfer to the right. It is also noted in this figure, represented schematically, the meshes 11 of the fabric and their special inclination towards the inside of the machine which determines a side effort of the needles in their movement through the corresponding beds or slots, which determines the trend to the simultaneous wearing, not only from its bottom but also from its side walls.

Thus, and in accordance with the improvements preconized, these efforts are suffered and absorbed by the milled rulers 5 which due to their hardness, minimize the effects of wearing and for their

exchangeable character makes practically indefinite the useful life of the needle plates.

It is not considered as necessary to extend further this description so that any expert in the subject understands the scope of the invention and the advantages derived from it.

The materials, shape, size and disposition of the elements will be susceptible of variation, provided this does not mean an alteration to the essentiality of the invention.

The terms under which this specification has been described must always be taken in a broad and not limitative mode.

Claims

1.- IMPROVEMENTS INTRODUCED IN THE NEEDLE PLATES OF RECTILINEAL KNITTING MACHINES, which having as purpose the prolongation of the useful life of such needle plates, versus the wearing caused by the needles in their corresponding beds or slots before the use of very stiff and little elastic yarns, which require a great load of stretching of the fabric, are essentially characterized in that they consist in the disposition, on each of the cited needle plates, and in the high area of same, that in which the efforts are more ample, of an exchangeable ruler, milled, so that it incorporates slots formally, dimensionally and positionally coincident with those of the needle plate, to establish a perfect continuity with the latter, in the conformation of the beds for the corresponding set of needles.

2.- IMPROVEMENTS INTRODUCED IN THE NEEDLE PLATES OF RECTILINEAL KNITTING MACHINES, as per claim 1, characterized in that the cited rulers are made of a material of a great hardness, considerably greater than that of the material which constitutes the needle plates.

3.- IMPROVEMENTS INTRODUCED IN THE NEEDLE PLATES OF RECTILINEAL KNITTING MACHINES, as per the previous claims, characterized in that the cited milled rulers adopt a dovetail profile, which facilitates their mounting and replacement on complementary guides of the needle plates, said rulers being fastened in their definitive position of mounting, with the cooperation of fastening pins, passing through extreme holes of the rulers and which are fitted to the very needle plates.

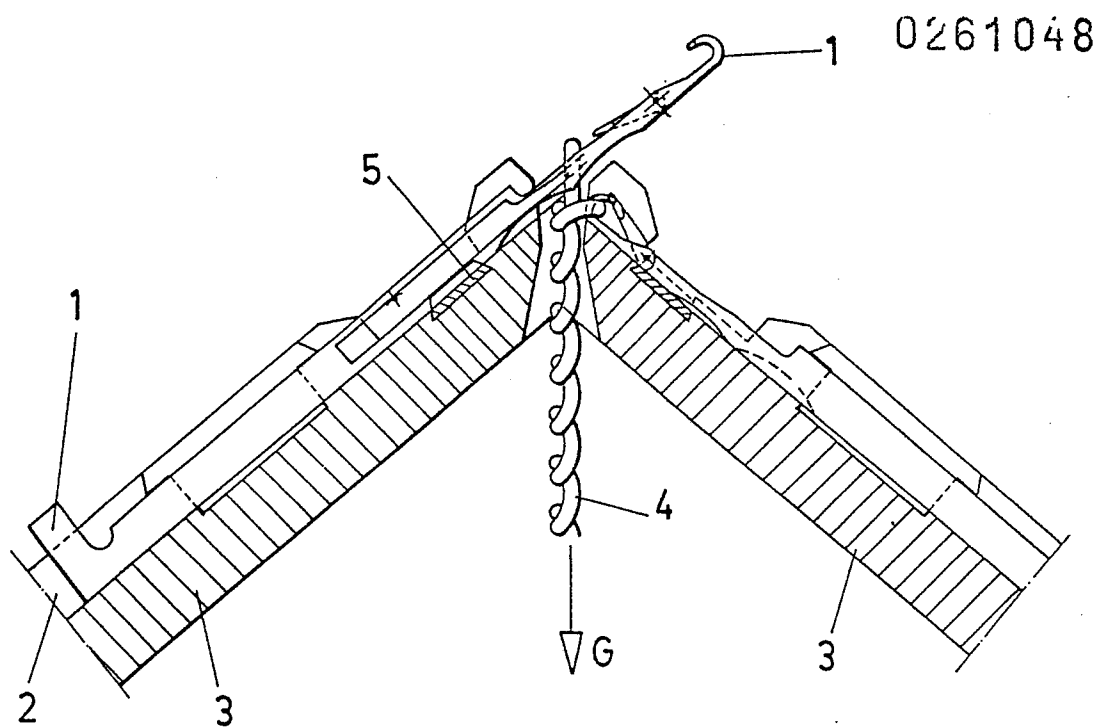


FIG.-1

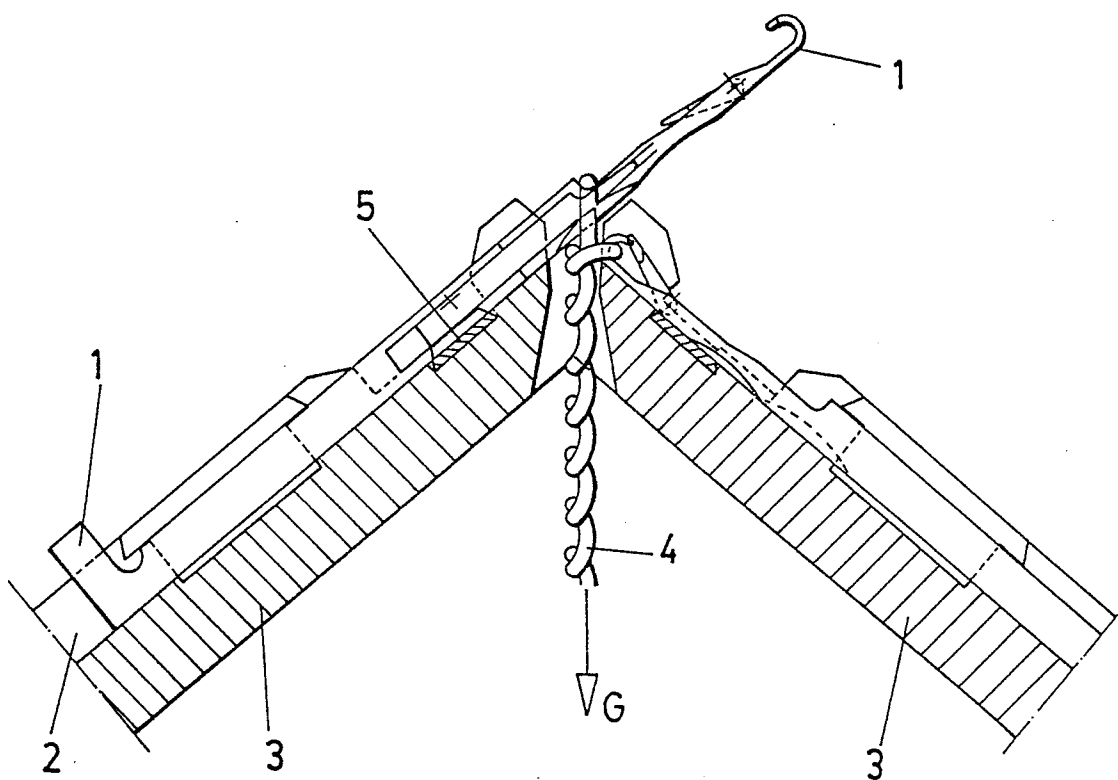


FIG.-2

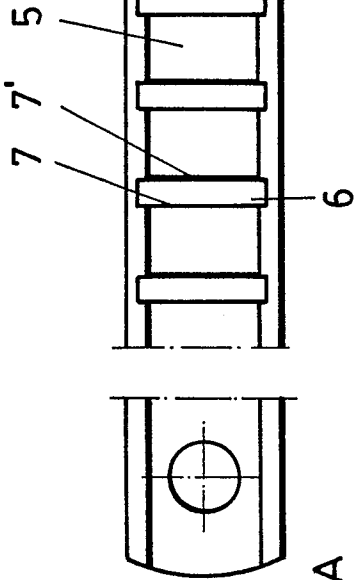
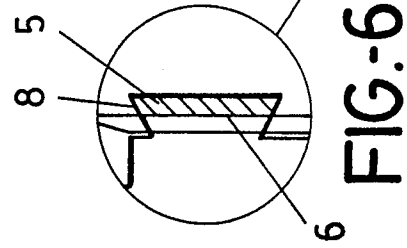


FIG-5

1 5 10 9

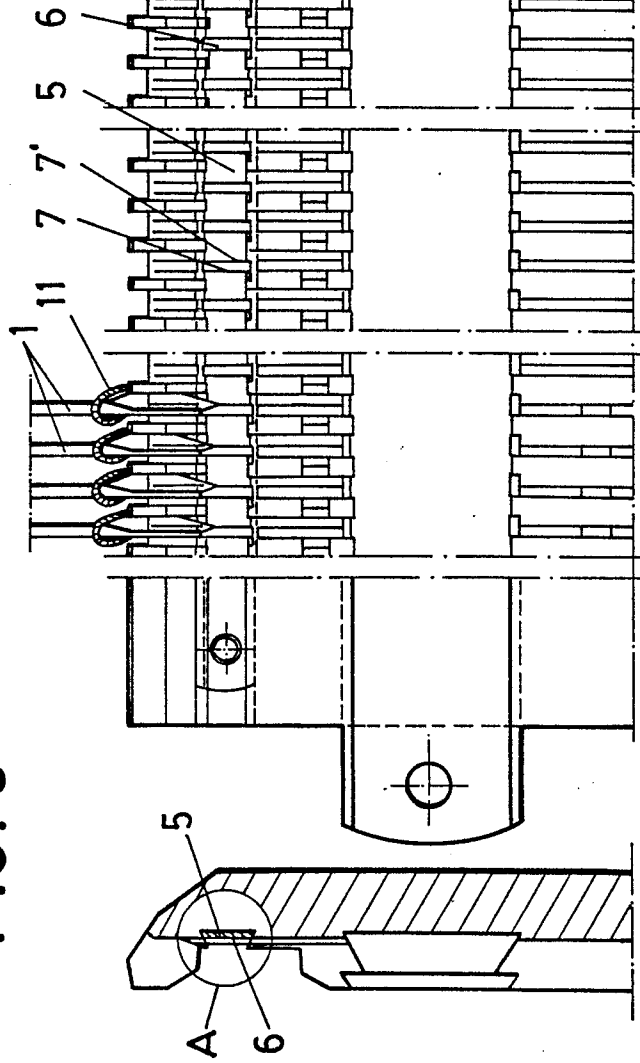


FIG-4

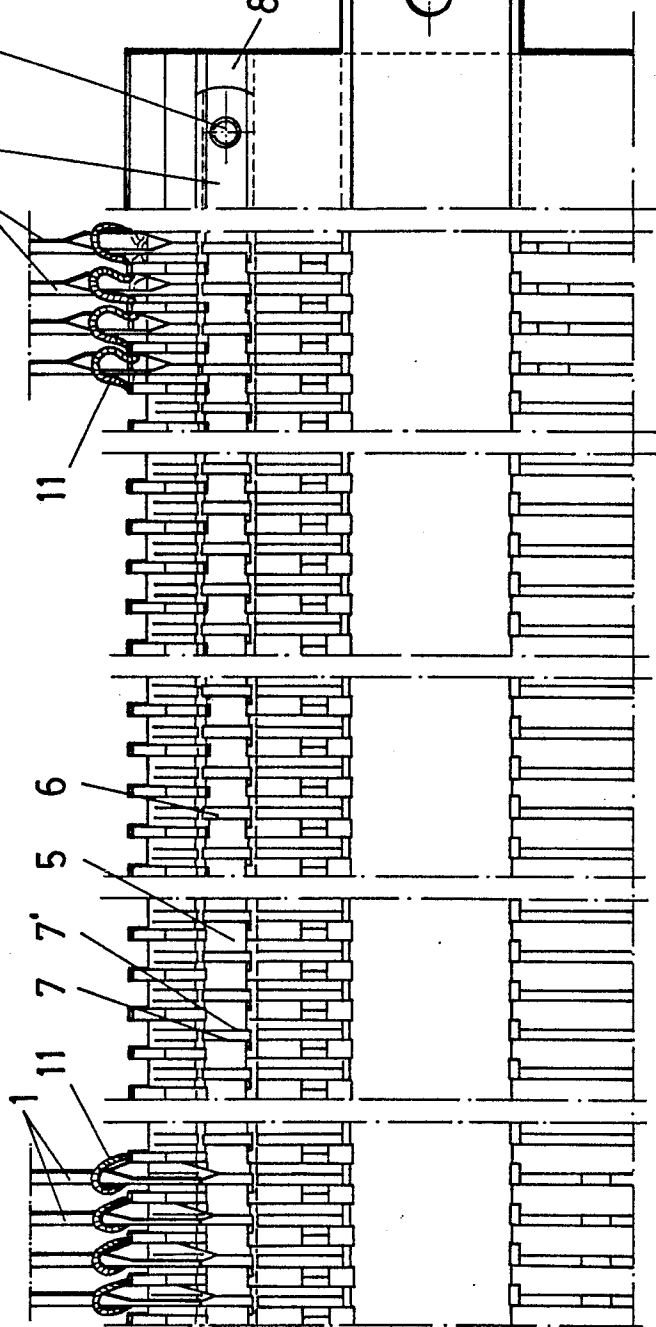


FIG-3