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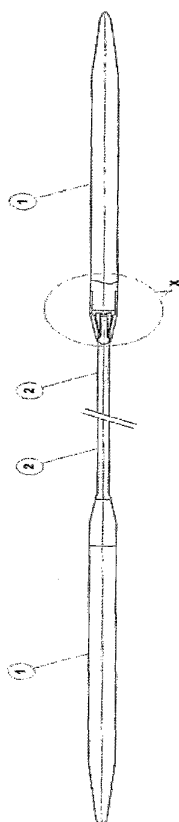
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(54) Title: A FLEXIBLE KNITTING PIN



(57) Abstract: A flexible knitting pin consisting of two relatively stiff shanks (1) pointed one end each, wherein said shanks (1) are connected with each other by the other end with a flexible hollow connecting material (2) comprising a joint; said joint between the stiff shanks (1) characterized in that it comprises a flexible hollow connecting material .



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## A FLEXIBLE KNITTING PIN

### FIELD OF THE INVENTION

5 The present invention relates to a flexible knitting pin, specifically a circular knitting pin made from any material. A method/process to realize this invention is also provided.

### BACKGROUND OF THE INVENTION

10 The following discussion of the prior art is intended to place the invention in an appropriate technical context and to enable the advantages of which to be more fully appreciated. Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of common general knowledge in the field.

15 Conventional knitting pins are known to have metal shanks comprising of a nylon monofilament. The step formed at the junction, usually prepared from nylon monofilament, is not smooth and therefore, the step catches the wool. This results in obstructed functioning of the knitting pin.

20 British patent GB876144 describes circular knitting pins of two relatively stiff metal end parts joined by a flexible connection made from a polymer plastics material. The flexible connecting tube is joined to the end parts by making axial bores in the undrawn end portions of the flexible connection, made from a length of moulded or extruded plastic material, and inserting the surface roughened spigots into the axial bores of the  
25 flexible connection while supplying sufficient heat to the junctions to cause the end parts and the connections to become fixed together and further elongating and reducing

in cross-section the intermediate portion of the flexible connection until further elongation is strongly resisted.

5 It is an object of the present invention to overcome or ameliorate one or more of the disadvantages of the prior art, or at least to provide a useful alternative.

### SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided a flexible knitting pin including:

10 two relatively stiff shanks pointed at one end each having a ferrule which holds a ball head screw; wherein said shanks are connected with each other by the other end with a flexible hollow connecting material comprising a joint; and  
a brass adaptor connecting said shank and flexible hollow connecting material for smooth transition.

15 Preferably, flexible knitting pin is circular.

The ferrule and ball head screw are preferably made of brass.

20 Preferably, the flexible hollow connecting material is in the form of a flexible hollow connecting tube.

Preferably, the joint consists of a metal sphere, hemisphere or cone positioned inside the hollow connecting material at a fixed position up against the end of the stiff shank. In  
25 certain embodiments, the metal sphere, hemisphere or cone inserted in the hollow connecting material rests against the flat end of the stiff shank.

In certain preferred embodiments, the stiff shanks are made from plastic, metal or wood.

In one particularly preferred embodiment, the shank is made of rose wood and the hollow flexible connecting material is made of polyurethane. However, it will be

5 appreciated by those skilled in the art that the flexible knitting pin can be made from any suitable material which, in use, enables smoother movement of stitches.

According to a second aspect of the invention, there is provided a process for manufacturing the flexible knitting pin of the first aspect of the invention, said process  
10 comprising:

finishing one end of the shank to a diameter suited to the inner diameter of the brass adaptor;

inserting the head of the ball headed screw into the hollow flexible, connecting tube;

15 attaching the threaded portion of the ferrule to the adaptor, either directly or using the ferrule depending upon the size of knitting pin, using an adhesive; and

fastening the adaptor carrying the ball headed screw, ferrule fixed to the hollow connecting tube with the help of adhesive.

20 Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise", "comprising", and the like are to be construed in an inclusive sense as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".

### BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

- 5 Fig. 1 is a perspective schematic view of a flexible knitting pin according to the present invention;

Fig. 2 is a side view of a shank of the knitting pin;

- 10 Fig. 3 is an enlarged detail view of the junction between the shank and the hollow flexible connecting tube;

Fig. 4 is a side view of an adapter of the knitting pin;

- 15 Fig. 5 shows a cut-away side view and an end view of a ferrule for holding a ball head screw in place at the end of the shank; and

Fig. 6 is a side view of the ball head screw.

20 DETAILED DESCRIPTION OF THE ACCOMPANYING DRAWINGS

Referring to the drawings, Fig. 1 illustrates a perspective schematic view of the present invention. The two relatively stiff ends of the pin are denoted by 1 whereas the hollow flexible connecting tube between the two pins is denoted by 2. The shank is made from rosewood whereas the hollow flexible connecting tube is made from polyurethane.

Fig. 2 illustrates one of the ends of the pin or shank which is pointed at one end and the other end forms a joint with the hollow flexible connecting tube.

5 Fig. 3 illustrates the junction between the shank and the hollow flexible connecting tube where the assembly of adaptor (3), ferrule (4) and the ball screw head (5) is shown in detail.

10 Fig. 4 illustrates the adaptor (3) which provides a smooth transition between the hollow flexible connecting material and the shank. The adaptor is made from brass.

Fig. 5 depicts the ferrule (4) which holds the ball head screw in place. The ferrule is made from brass.

15 Fig. 6 illustrates the ball head screw (5). The screw is made of brass.

The present invention relates to a flexible knitting pin, preferably a circular knitting pin, made from any material which enables smoother movement of stitches compared to the prior art and is easier to use. Also, the method of realizing this invention is relatively simple while maintaining the same functionality.

20 The knitting needle consists of two stiff shanks which are pointed at one end and suitably machined for attachment at the other. These shanks are then connected to each other using a flexible tube.

25 Thus the product consists of two stiff shanks, suitably pointed at one end each for knitting and connected from the other end using a flexible hollow tube. The joint between the stiff shanks and the flexible hollow connecting tube consists of a metal



sphere, hemisphere or cone positioned inside the hollow connecting tube at a fixed position up against the end of the stiff shank. The joint between the stiff shanks and the hollow flexible connecting tube is extremely smooth to enable the individual stitches to slide over the connection without impairment and without the yarn snagging at the connection.

Another aspect of the invention is the method to realize this invention. The two stiff shanks of the knitting needle are made from plastic, metal or wood. The joint between the stiff shanks and the flexible hollow connecting tube is made by insertion of a metal sphere, hemisphere or cone into the hollow connecting material in such a way that the ball rests against the flat end of the stiff shank.

In a preferred embodiment, the shank is made of rose wood whereas the hollow flexible connecting tube is made of polyurethane. At one end of the shank is a ferrule made of brass which holds a ball head screw made of brass. To enable a smooth transition between the shank and the hollow flexible connecting material, an adaptor made of brass has been put at the joint.

In another embodiment of the invention, a method for the manufacture of the flexible knitting pin is provided. The shanks are manufactured by conventional manufacturing processes. The attachment to the flexible material is the substance of the invention. The flexible material used is in the form of a polyurethane tube. This polyurethane tube is connected to the rigid shanks using a brass adaptor, a ball headed screw and a threaded ferrule.

The joint itself is made up of brass parts which are attached to the wooden shank and to the polyurethane flexible tube. The brass ferrule and adaptor are manufactured by

conventional turning processes using automatic lathes. They are fashioned from brass rod. These parts are then lacquered to prevent tarnishing. The tolerances are such that they meet the requirements of the product and the joint. The ball headed screw is manufactured, out of brass rod, in a two stage operation. The first stage is a standard  
5 turning operation carried out on automatic lathes. The second stage is a stamping operation which is carried out on a special purpose machine built and designed by the applicant. After the second operation, the screw is lacquered to prevent tarnishing.

10 The rigid shanks are made with the back end (the end that is not pointed) finished to a diameter suited to the inner diameter of the brass adaptor. The head of the ball headed screw is inserted into the polyurethane tube.

15 The threaded portion of the ball headed screw is attached to the adaptor either directly, or using the ferrule (depending upon the size of knitting pin).

Adhesive is applied to the threaded portion to ensure that it locks tight. The adaptor carrying the ball headed screw, ferrule and attached to the polyurethane tube is then fastened to the shank with the use of an adhesive.

20 The above method advantageously results in an extremely smooth joint between the rigid shank and the flexible tube.

25 Various modifications and alterations of this invention will become apparent to those skilled in the art without departing from the scope and spirit of this invention and it should be understood that this invention is not unduly limited to the illustrative embodiment set forth herein.

## CLAIMS:-

1. A flexible knitting pin including:  
two relatively stiff shanks pointed at one end each having a ferrule which holds a  
5 ball head screw; wherein said shanks are connected with each other by the other end  
with a flexible hollow connecting material comprising a joint; and  
a brass adapter connecting said shank and flexible hollow connecting material for  
smooth transition.
- 10 2. A flexible knitting pin as claimed in claim 1, wherein said ferrule and ball head  
screw are made of brass.
3. A flexible knitting pin as claimed in claim 1 or claim 2, wherein said flexible  
hollow connecting material is flexible hollow connecting tube.  
15
4. A flexible knitting pin as claimed in any one of the preceding claims, wherein said  
joint consists of a metal sphere, hemisphere or cone positioned inside the hollow  
connecting material at a fixed position up against the end of the stiff shank.
- 20 5. A flexible knitting pin as claimed in any one of the preceding claims, wherein the  
said stiff shanks are made from plastic, metal or wood.
6. A flexible knitting pin as claimed in claim 4, wherein the said metal sphere,  
hemisphere or cone inserted in the hollow connecting material rests against the flat end  
25 of the stiff shank.

7. A flexible knitting pin as claimed in any one of the preceding claims, wherein said shank is made of rose wood and the hollow flexible connecting material is made of polyurethane.

5 8. A process for manufacturing the flexible knitting pin as claimed in any one of claims 1 to 7, said process comprising:

finishing one end of the shank to a diameter suited to the inner diameter of the brass adaptor;

10 inserting the head of the ball headed screw into the hollow flexible, connecting tube;

attaching the threaded portion of the ferrule to the adaptor, either directly or using the ferrule depending upon the size of knitting pin, using an adhesive; and

fastening the adaptor carrying the ball headed screw, ferrule fixed to the hollow connecting tube with the help of adhesive.

15

9. A flexible knitting pin substantially as herein described with reference to any one of the embodiments of the invention illustrated in the accompanying drawings and/or examples.

20 10. A process for manufacturing the flexible knitting pin substantially as herein described with reference to any one of the embodiments of the invention illustrated in the accompanying drawings and/or examples.

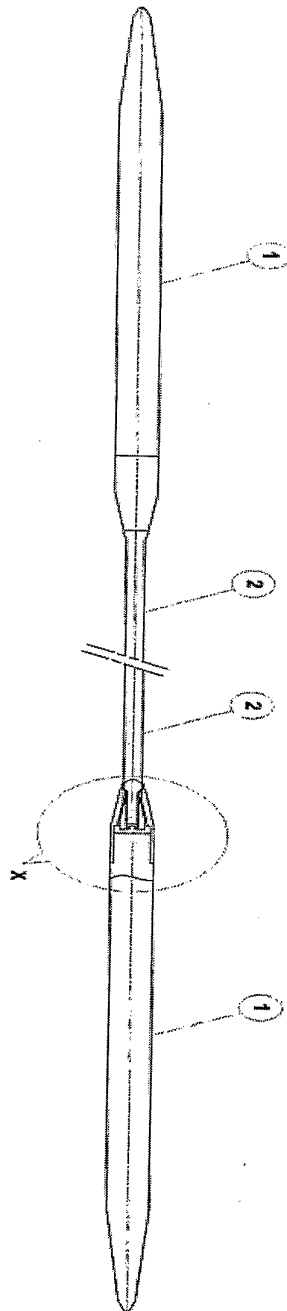


FIGURE 1

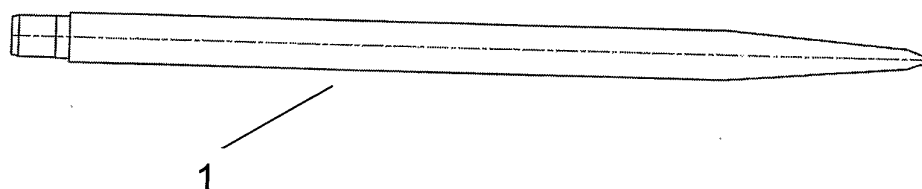
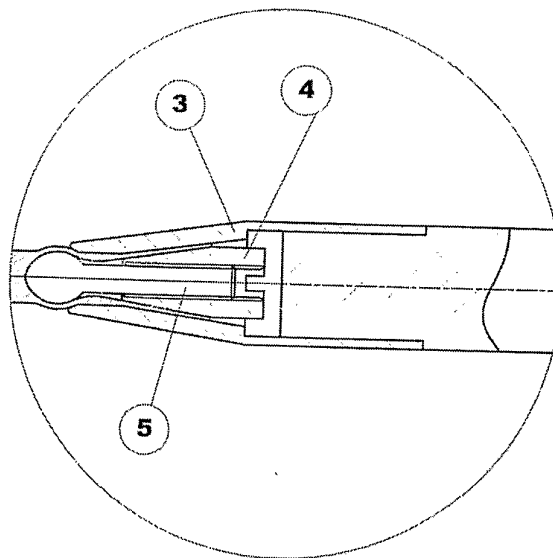


FIGURE 2



DETAIL-X

FIGURE 3

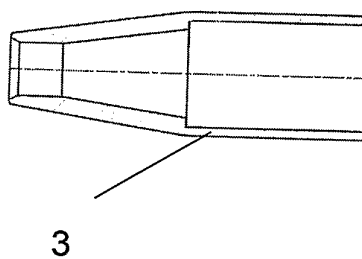


FIGURE 4

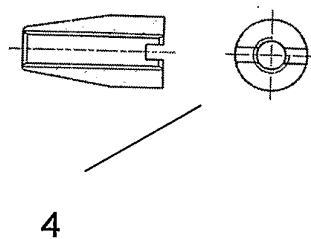


FIGURE 5

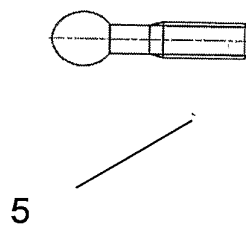


FIGURE 6