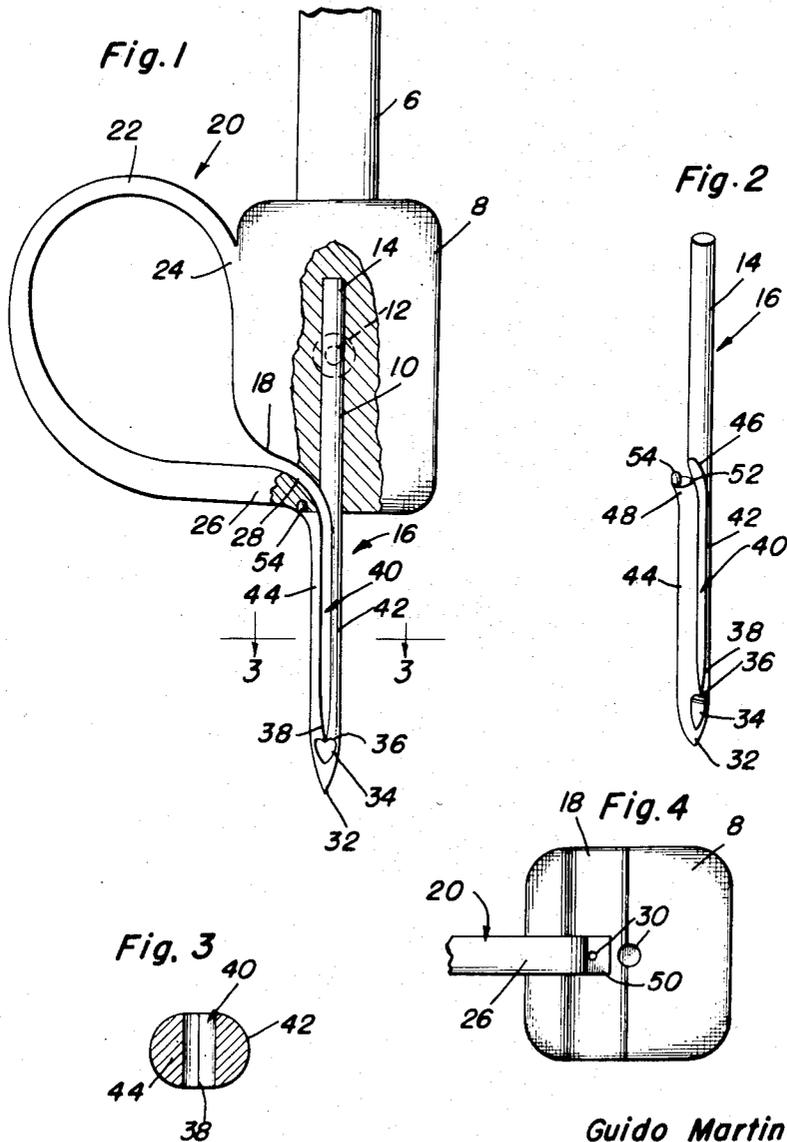


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G. MARTINELLI
SELF-THREADING SEWING MACHINE
NEEDLE WITH IMPROVED BLOCK
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Guido Martinelli

INVENTOR.

BY *Alvanor W. Dixon*
and Harvey B. Jackson
Attorneys

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SELF-THREADING SEWING MACHINE NEEDLE WITH IMPROVED BLOCK

Guido Martinelli, Dallas, Tex.

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The present invention relates to certain new and useful improvements in sewing machine needles of the self-threading type and relates more particularly to a novel needle, a novel block into which it is fitted, and the improved end result effected through this combination needle and block.

Summarized briefly, the over-all concept has to do with a structurally distinct especially slotted needle, a block into which the shank of the needle is fitted wherein said block has a thread guiding cam and being further provided with a complementary guide which encompasses the thread and shunts and properly pilots the same into the coacting slot means in the needle.

Another object of the invention has to do with a needle which is characterized by a shank pointed at one end and provided at said end with a thread receiving eye, and further provided with a lengthwise slot registering with and ranging axially from said eye and opening laterally through one side of the intermediate portion of said shank and thus providing a thread inlet opening.

Another object of the invention has to do with the stated needle wherein the presence of the slot actually divides the shank into a rigid portion on one side of the slot and a complementary flexible portion flanking the other side of the slot and having an outflaring free terminal, said terminal having a detent and providing a novel arrangement for satisfactorily directing the free end of the thread into the slot of the needle.

Then, too, novelty is predicated on a needle of the stated type which is held in the socket of the needle bar block by the usual set screw, said block having guide means on one side which takes the form of a loop, one end of the loop being fixed and the other end free and flexible and provided with a socket which constitutes a keeper for the coacting detent on the flexible portion of the needle.

More importantly, the invention has to do with the combination of a block and slotted needle with an especially shaped thread retaining eye and wherein the block has loop-like guide means for corralling the free end of the thread and feeding it into the slotted shank of the needle almost without hindrance.

Other objects and advantages will become more readily apparent from the following description and the accompanying sheet of illustrative drawings.

In the accompanying sheet of drawings where-

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in like numerals are employed to designate like parts throughout the views:

Figure 1 is a view partly in section and partly in elevation of a needle bar, block and needle combination constructed in accordance with the principles of the present invention.

Figure 2 is a perspective view of the needle by itself.

Figure 3 is an enlarged cross-section on the line 3—3 of Figure 1.

Figure 4 is a fragmentary bottom plan view of the block.

Referring now to the drawings and especially to Figure 1, the numeral 6 denotes a reciprocable needle bar having needle attaching means on its lower end. The means is sometimes referred to as a head, in other instances as a needle collar and in others merely as a needle block. Here, it is well to think of the element in question as a block and the same is denoted by the numeral 8 and is generally rectangular and provided with an axial socket 10 provided with a set screw 12, said socket being adapted to accommodate, as usual, the shank portion 14 of the sewing machine needle 16. The block is distinct in that one lower corner portion is relieved and properly shaped up to provide a thread directing cam surface 18. Another improvement has to do with the thread guide means 20. Specifically, this takes the form of a loop of appropriate size and general shape, which permits the free end of the thread (not shown) to be drawn therethrough so it will be all set to find its way into the self-threading needle to be hereinafter particularly described. Said loop has one curved end portion 22 integrally formed at 24 to the upper portion of the block. The other end portion 26 is flexible and free and has a cam surface 28 which coacts with the cam surface 18 in refining a sort of a curvate channel for "channeling" the thread into the needle. The terminal of this end portion is provided with a keeper recess or socket 30 to be hereinafter described.

Taking up now in detail the construction of the needle best shown in Figure 2 it is clear, as before indicated, that this is characterized by the usual point 32 having an eye 34 therein. This eye is distinct here because it is of general heart-shaped configuration with lobe portions 36—36 situated on opposite sides of close spaced parallel surfaces 38—38 defining an end portion of slot means 40. The latter is axially arranged and opens into the eye by way of the restriction 38—38. This restriction plus the heart-shaped configuration of the eye prevents the thread

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from accidentally slipping out of place once it is through the slot and in the eye proper. The slot means is such that it axially divides the shank of the needle into a relatively rigid portion 42 on one side of the slot and a flexible portion or finger 44 on the opposite side of the slot. The stationary part has a curvate surface 46 which is coincident with the cam surface 18 as best shown in Figure 1. The free end of the finger is laterally flared as at 48 where it is then properly lined up with the abutment surface 50 (see Figure 4) on the free end portion of the guide loop. In fact there is a flat abutment at 52 which engages the abutment 50 and the former is provided with a detent 54 which is removably snapped into the keeper socket 30. Thus, the finger portion of the needle is mechanically joined with the free end portion of the guide loop. This brings all surfaces into requisite companionate relationship to provide an effective self-threading block and needle assembly.

In operation the free end of the thread is passed through the opening in the loop means 20. One end of the thread being attached to the usual spool on the head of the sewing machine, the free end is merely pulled through and then down against the surfaces 18 and 28 where it is piloted and channeled into the entrance of the slot, then drawn down in the slot, passed through the constriction means 38-38 and trapped and retained in an obvious manner in the eye 34 of the needle.

Minor changes in shape, size, materials and rearrangement of parts may be resorted to in actual practice provided no departure is made from the invention as claimed.

Having described the invention, what is claimed as new is:

1. In a self-threading needle construction, in combination, a needle bar having a block which is flat at one end, said block having an axial socket therein opening centrally through said flat end for reception of the shank of a needle, said needle having a shank with its inner end fitting into said socket and having an eye at its outer end and a lengthwise thread delivering slot opening at one end into said eye and opening at its opposite inner end laterally and outwardly through a side of the intermediate portion of said shank remote from said eye and providing a thread inlet to said slot, that portion of the block which is in alignment with said inlet having a cam surface for directing a contacting thread into said slot for delivering said thread into said eye, and a thread guide situated on that portion of said block having said cam surface and in which the free end of the thread is initially and momentarily corralled and piloted toward said cam surface and cooperating inlet, said guide be-

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ing in the form of a loop and having one end fixed on said block and the other end free and in close spaced proximity to said flat end, said free end having an outwardly disposed surface which is coplanar with said flat end and also having an inwardly positioned cam surface opposed to said first cam surface and said cam surfaces conjointly functioning to channel the thread into said inlet.

2. In a self-threading needle construction, a needle bar having a block, said block being provided with an axial socket opening at its outer end through the corresponding end of said block for reception and retention of the shank portion of an insertable and removable needle, one side surface of said block being relieved and formed into a thread gliding and directing cam surface, said cam surface being located in close proximity to the outer end of said block and merging into and registering with the outer open end of said socket, and a guide loop situated on said one side surface of said block and having one end formed integrally with said one side surface, and the other end free and terminating in close proximity to said cam surface, said free end having a cam surface opposed to and aligned with said first named cam surface and said two cam surfaces defining a gradually narrowing crotch and piloting channel for a coacting thread.

3. The structure defined in claim 2, and the combination therewith of a needle having a rigid shank with its inner end fitted into said socket and its outer end projecting axially beyond the socket, the projecting outer end of the shank having eye means at the outer end of the shank and also having lengthwise slot means in communication at its outer end with said eye means, said slot means opening at its inner end through an intermediate portion of the shank at a point removed from said eye means and dividing the cooperating portions of the shank into rigid and flexible portions, the free end of said flexible portion terminating adjacent to and being aligned with and abutting the free end of said guide loop, the latter free end having a keeper socket and the free end of said flexible portion having a detent fitting removably into said keeper socket.

GUIDO MARTINELLI.

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