

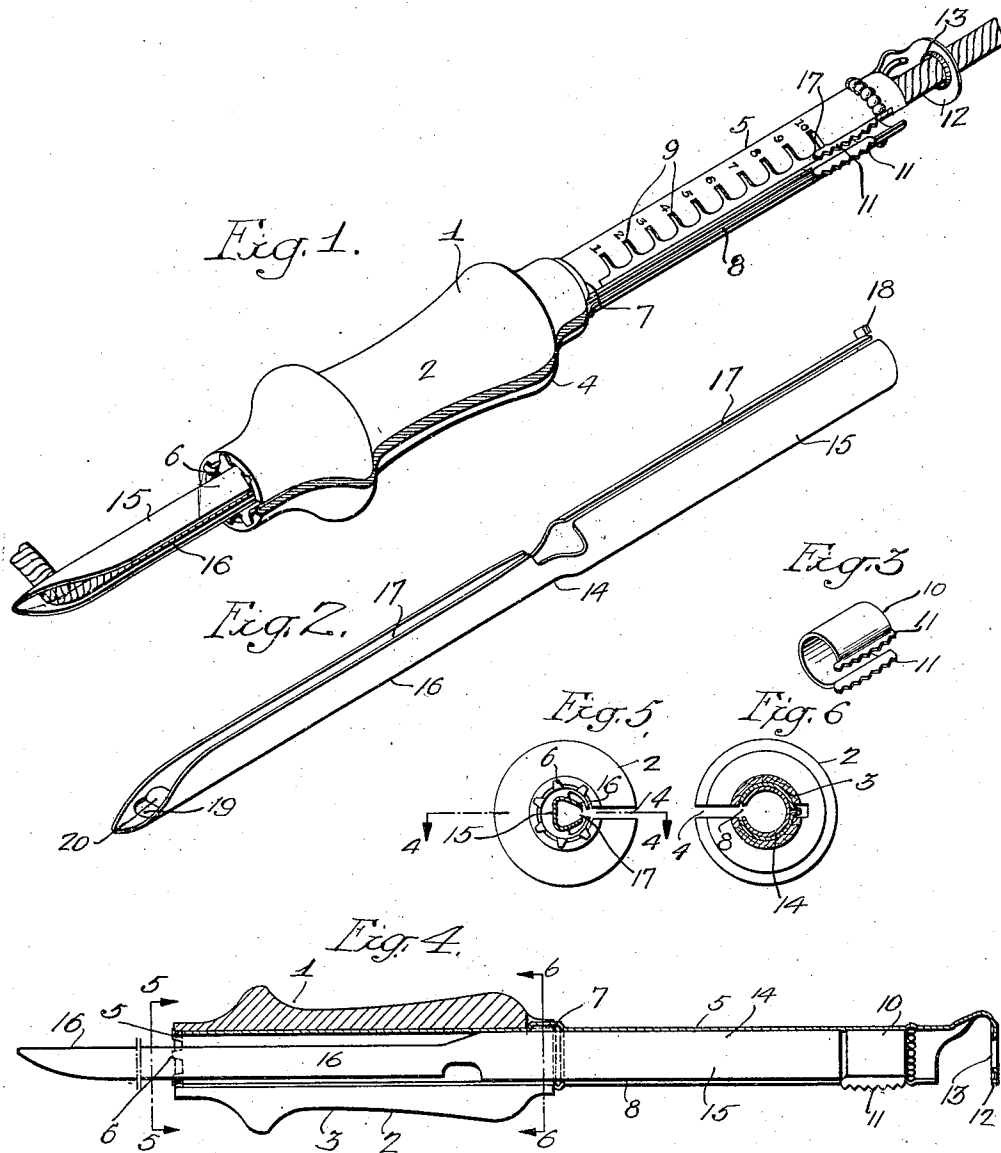
Sept. 20, 1932.

W. L. ROBERTS

1,878,889

TUFTING NEEDLE

Filed May 12, 1931



Inventor:
 Wilmer L. Roberts
 By his Attorneys
 Houston & Houston

UNITED STATES PATENT OFFICE

WILMER L. ROBERTS, OF PALMYRA, NEW JERSEY, ASSIGNOR TO WM. H. HORSTMANN CO.,
OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

TUFTING NEEDLE

Application filed May 12, 1931. Serial No. 536,880.

This invention relates to new and useful improvements in tufting needles and has for an object provision of novel means for adjusting the functional length of said needle.

Another object of the invention is to provide a tufting needle wherein the threading of said needle is greatly simplified.

Another object of the invention is to provide a tufting device wherein needles of various sizes and character may be interchangeably secured in a common holder.

Another object of the invention is to provide a tufting needle of novel design wherein the friction between the needle and the yarn and fabric is substantially reduced.

Another object of the invention is to provide a tufting needle, the tip of which is novelly constructed to eliminate the tendency to cut or damage the fabric.

A further object of the invention is to provide a tufting needle, the eyelet in the tip of which is formed to permit the yarn to travel freely and without friction through said eyelet.

The invention further resides in certain novel features and details of construction set forth hereinafter and shown in the accompanying drawing, in which:

Figure 1 is a perspective view of the tufting device embodying this invention;

Fig. 2 is a view in perspective of a tufting needle removed from the holder;

Fig. 3 is a view in perspective of the movable collar for maintaining the needle in any longitudinal position within the holder to which it is adjusted;

Fig. 4 is a longitudinal sectional view on line 4-4, Fig. 5;

Fig. 5 is a transverse sectional view on line 5-5, Fig. 4; and

Fig. 6 is a transverse sectional view on line 6-6, Fig. 4.

This invention contemplates certain novel improvements in tufting devices designed to eliminate certain defects present heretofore in similar devices. The tufting needle in the present instance is formed with a substantially triangular cross sectional shape, the purpose of which is to reduce to a minimum the frictional resistance to the passage

of yarn through the said needle and to the passage of the needle through the base fabric. The triangular shape of the needle reduces contact with the yarn to three points on the inner surface of the needle where, in the past the said contact has occurred throughout the entire circumferential surface of the yarn and the inner circumferential surface of the circular needle. The novel form of the needle described above also permits the relatively easy insertion and withdrawal of the needle from the fabric being embroidered.

Prior to my invention, it was the practice in finishing the tip end of the needle to merely cut off the adjacent sides thereof at the said tip, leaving a blade-like extension at the point which had a tendency to cut or damage the fabric. In accordance with this invention, I construct the tip of a needle in a novel manner, the material of the needle adjacent the tip being drawn up towards the point at the sides thereof, and by rounding up the sides, as illustrated in Fig. 2 of the drawing, the tendency of the point or tip to sever or damage the fabric is substantially eliminated.

A further improvement is embodied in the construction of the eyelet through which the yarn is adapted to pass at the tip of the needle. Heretofore the eyelet has been merely punched out and the passage of the yarn through the eyelet is subjected to an unnecessary amount of friction which retards the free passage thereof through the said eyelet. In the present instance I form the eyelet by pressing out a tongue-like portion shown in Fig. 2 of the drawings which is folded against the inner surface of the needle to form a rounded bead-like element over which the yarn travels freely and which has no tendency to frictionally resist the passage of the said yarn through the needle and the eye in the tip thereof.

I also provide a novel arrangement of longitudinal slots in the component parts of my device which greatly enhance the ease with which my tufting device may be threaded. Referring to the drawing, the tufting needle embodying my invention consists of a holder 1 comprising a handle 2, having a longitudi-

nal cylindrical bore 3 extending therethrough, a longitudinal slot 4, and a tubular element 5. The handle 2 may have an external surface in any suitable form and for the purpose of description, the design shown in the accompanying drawing is sufficient.

The metallic tubular element 5 is secured in the longitudinal bore 3 of the handle 2, and, in the present instance extends a substantial distance rearwardly thereof, the said tubular element 5 being maintained rigidly within the handle 2 by means of a toothed annular element 6, the teeth of which are formed to pass over the outer end surface of the handle 2. An annular bead 7 is further formed on the tubular element 5 adjacent the rear end surface of the said handle 2. A longitudinal slot 8 is formed in the tubular element 5 and is positioned therein to substantially coincide with the slot 4 formed in the handle 2. A plurality of aligned parallel notches 9 are formed at one side of the slot 8 in the portion of the tubular element 5 extending rearwardly of the handle 2. A slidable collar member 10 having outwardly extending toothed flanges 11 is longitudinally and internally positioned in the tubular member 5, the said toothed flanges 11 of the member 10 being adapted to extend outwardly through the slot 8 in the tube 5, affording a suitable guide for the member 10 and means for moving the said member longitudinally in the tube 5. An offset tongue 12 at the rear end of the tube 5 prevents the removal of the member 10 from said tube 5. An annular eyelet 13 is formed adjacent the rear end of the tube 5 and integrally therewith, the said eyelet being substantially parallel to the transverse axis of the said tube 5, the purpose for which will be set forth hereinafter.

A plurality of needles 14, adapted for use in conjunction with the above described device, may be of various cross sectional size, depending upon the type of work to be done. However, for the purpose of description, it is only necessary that the details of one of such needles be set forth.

The needles 14 comprise in general a cylindrical portion 15 of standard cross section dimension and a smaller triangular portion 16 which may be of various cross sectional dimensions not exceeding that of the cylindrical portion 15, (see Fig. 5). An aligned slot 17 is formed respectively in each one of the portions 15 and 16 of the needle 14 the said slots being adapted when operably secured in the handle 2 and the tube 5, to substantially coincide with the grooves 4 and 8 respectively formed therein. An outwardly extending tongue 18 is formed on the rear end of the needle 14 and integral therewith, the said tongue 18 being adapted to move in the coinciding slots 4 and 8 in the handle 2 and the tube 5 respectively and to be moved

into engagement with one of the parallel slots 9 when the needle 14 is turned. The working tip of the needle at the outer extremity of the triangular portion 16 of the said needle 14 has an eyelet 19 formed therein by pressing out the tongue designated as 20 in Fig. 2, the said tongue 20 being folded inwardly against the inner face of the needle 14 to form a rounded bead-like edge, over which the yarn travels freely and which has no tendency to frictionally hinder the passage thereof through the needle.

To assemble the device, a needle 14 of desired cross sectional dimension is placed in the holder 1 comprising the handle 2 and the tube 5 in such a manner that the laterally extending tongue 18 of the latter, resides in one of the parallel slots 9 formed at one side of the slot 8 in the tube 5, the said tongue 18 being inserted in the slot which affords the adjustment desired for ensuing tufting operation. When the tongue 18 resides in one of the slots 9, the slots 17 of the needle 14 are placed in a substantially corresponding relation coinciding with the slots 4 and 8 formed in the handle 2 and tube 5. The collar member 10 is then positioned to abut the rear extremity of the needle 14, in which position, the outwardly extending flanges 11 of the member 10 are arranged to prevent the removal of the tongue 18 from the slot 9 until the member 10 is moved out of engagement with the needle 14.

When threading the needle, it is merely necessary to pass the yarn through the eyelet 13 and the eye 19 of the needle 14, and the slots 17, 4 and 8 respectively coinciding will permit the yarn to pass inwardly of the tufting needle, greatly simplifying the threading process which would be difficult, should it be necessary to pass the yarn longitudinally through the entire needle.

In using the tufting device with the needle 14 adjustably positioned for the ensuing work, the tip 20 of the needle 14 is passed through the base material, such as burlap. The said needle being pushed through the fabric to the handle 1, the needle is raised to a point just above the upper surface of the fabric, and a loop of yarn is formed in the under side of the fabric. The needle point 20 is then moved to the point for the next stitch and is again passed to the under side of the fabric to the handle and again raised to a point just sufficient to permit the point 20 of the needle to be moved for a subsequent stitch.

I claim:

1. A holder for a tufting needle comprising a handle and a cylindrical tubular element extending outwardly at one end thereof, the said handle and tube having aligned slots therein and the tube further having parallel slots extending normal to and connected with the first mentioned slot in said

tube, a tufting needle comprising a cylindrical and a triangular portion having aligned grooves therein, an outwardly extending tongue at the outer end of the cylindrical portion and arranged to engage the parallel slots in the holder, and a collar slidably mounted in said holder and arranged when in abutment with the needle to prevent the removal of said tongue from engagement with the parallel slots, the slots in the holder and needle being arranged to coincide with each other in their respective positions when the tongue of the needle is in engagement with one of said parallel slots.

2. The combination of a holder having a plurality of parallel slots therein, a tufting needle slidably with respect to said holder, means carried by said needle arranged for engagement with said slots and means carried by and slidably with respect to the holder arranged when in abutment with said needle, to prevent the removal of the means carried by said needle from one of said slots.

3. The combination with a holder, having a plurality of parallel slots therein, of a tufting needle slidably mounted in said holder, means carried by said needle arranged to engage said slots for a fixed position of the needle longitudinally with respect to the holder and means carried by the holder for locking the needle in the fixed position in said holder.

4. The combination of a holder having a plurality of parallel slots therein, a tufting needle comprising a cylindrical and a triangular portion slidably with respect to said holder, means carried by said needle arranged for engagement with said slots, and means carried by and slidably with respect to the holder arranged when in abutment with said needle, to prevent the removal of the means carried by said needle from one of said slots.

5. A tufting needle having longitudinally aligned slots therein, a holder arranged to receive said needle comprising a tubular element having longitudinal slots substantially coinciding with the slots in the needle to facilitate threading thereof, said tubular element also having parallel slots therein, and means carried by the needle arranged for insertion in said parallel slots for determining the position of the needle with respect to the holder.

WILMER L. ROBERTS.