

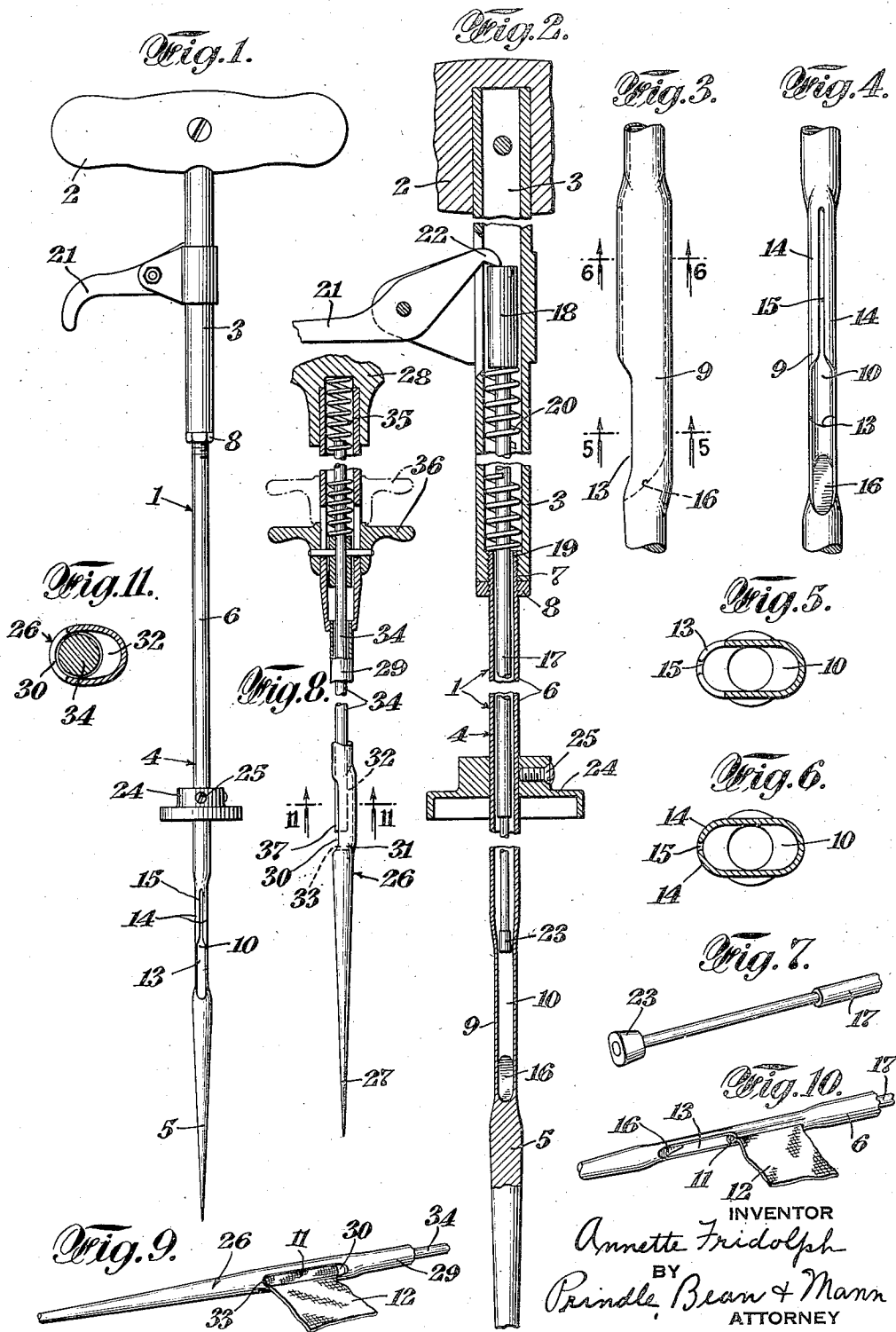
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TUFTING NEEDLE

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TUFTING NEEDLE

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This invention relates to improvements in what I term as tufting needles, and by that is meant a needle or similar device which is primarily adapted to practice the process of and perform the tufting operation disclosed in my pending application Serial Number 542,799 filed June 8, 1931 for Method of tufting and articles therefor. The needles, however, may be used for other purposes.

The principle object of this invention is the provision of such a device which is provided with means for receiving and holding the tufting head of the tufting element (such as disclosed in the above identified application, or otherwise) together with a plunger resiliently mounted within the needle and adapted to engage the end of the tufting head when positioned within the tufting needle.

In the disclosure in this application I show two forms of such device, one in which the plunger is used as an ejector to force the tufting head out of engagement with the needle, and the other in which the plunger is used as a means to bear against the end of the tufting head of the tufting element and hold the same in position within the needle during the tufting operation.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, this invention consists in the construction, combination and arrangement of parts hereinafter described and then sought to be defined in the appended claims, reference being had to the accompanying drawing forming a part hereof and which shows, merely for the purpose of illustrative disclosure, two embodiments of my invention, it being expressly understood, however, that various changes may be made in practice within the scope of the claims without digressing from my inventive idea.

In the drawing—

Figure 1 represents a side elevational view of one form of device embodying my invention.

Figure 2 is a vertical longitudinal cross section of the operating parts of the device shown in Figure 1 on a slightly enlarged scale.

Figure 3 is a perspective view of that part of the body of the device in which the tufting head of the tufting element is positioned, this view being taken from the side.

Figure 4 is a view of the same part shown in Figure 3 taken from the front.

Figure 5 is a transverse cross section taken substantially on line 5—5 of Figure 3.

Figure 6 is a transverse cross section taken substantially on line 6—6 of Figure 3.

Figure 7 is a perspective view of the lower portion of the plunger which is positioned within the needle.

Figure 8 is a view in elevation and section (parts being broken away) of a modified form of my invention.

Figure 9 is a detailed view showing the tufting head in position in the device shown in Figure 8.

Figure 10 is a detailed view showing the tufting head in position in the device shown in Figures 1 and 2.

Figure 11 is a transverse cross section on line 11—11 of Figure 8.

Referring now to the drawing and first to Figures 1 to 7 inclusive, the numeral 1 designates the needle as a whole, which in the form shown, has a handle member 2 with an enlarged supporting sleeve 3 connected thereto. To the lower end of sleeve 3 is connected the body part 4 of the needle. This body part is elongated and has the longitudinal sharp thin pointed member 5 at its lower end and this part is preferably solid. The upper part 6 of the body member 4 is hollow or in the form of a tube and may be secured directly to the lower end of sleeve 3 by means of thread 7 and nut 8, as shown.

While the part 6 of body member 4 is of general tubular construction and substantially circular in cross section for the great part of its length, it is to be noted that the lower portion thereof may be flattened as at 9 so as to form a substantially narrow receiving recess 10 for the tufting head 11 of tufting element 12. As one form of this tufting head is substantially flat in construction the receiving recess 10 is made substantially flat so as to completely receive the tufting head within the same. Entrance to this recess is provided by the elongated opening or aperture 13 which is of sufficient size to permit the end of the tufting element 11 to be inserted therethrough into the recess 10 and to be moved along into the recess underneath the overhanging portions 14 of the tubular body part 6, a restricted slot 15 being provided therein and communicating with the opening or aperture 13 so as to receive the material of the body of the tufting element as a whole and permit the passage of the tufting head entirely or in part within the recess 10. At the lower end of this recess where it joins the needle point 5, I provide the bevelled or inclined surface 16 which facilitates the insertion of the tufting head within the recess 10 and also assists in the ejection of the same from the recess at the completion of the tufting operation.

A rod or plunger 17 is movably mounted with-

in the sleeve 3 and the tubular portion 6 of the needle. The upper portion of this rod or plunger is provided with a head 18 between which and an internal shoulder 19 a spring 20 is positioned so as to normally hold the plunger as a whole in a retracted position. A trigger member 21 is suitably mounted for movement upon the sleeve 3 and has an actuating end 22 which engages the head 18 of the plunger 17. This trigger member is located in such position that when the implement is grasped by the hand of the operator, the trigger may be readily actuated by the fingers of the operator to depress or to move the plunger downwardly against the resistance of spring 20.

The lower end of plunger 17 is provided with a slightly enlarged foot 23 which is normally positioned at the upper entrance to the recess 10 which begins with the flattened or inwardly pressed portion 9 of the tubular part 6 of the needle. This foot is of substantially oval shape in cross section as shown, so as to fit and readily move within the upper portion of recess 10. The foot 23 is adapted to engage the upper end of the tufting head 11 which has been inserted within the recess and after the pointed portion of the needle has been passed entirely through the mattress or other article being tufted, a depression of the plunger by actuation of the trigger causes the foot 23 to push the tufting head 11 until it reaches the opening 13, and due to the pressure against one end of the tufting head and also the engagement of the other end of the tufting head with the inclined surface 16, said tufting head will be quickly and positively forced out from said recess 10 and ejected from the needle.

The operation of this device in practicing my tufting process will be briefly described. One of the tufting elements 12 (which in one form comprises a length of tape or other flexible material with a stiff head formed or provided on each end thereof) is connected to the needle by inserting one of the tufting heads 11 thereof through the opening or aperture 13 into the recess 10 and the needle is forced through the mattress, day bed, upholstery or other article being tufted until the pointed portion of the needle beyond the opening or aperture emerges from the other side of the article being tufted. It is understood that the free tufting head of the tufting element engages the side of the article being tufted into which the needle is inserted, and that when the opening or aperture 13 of the needle appears beyond the other surface of the article being tufted, the actuation of the trigger will eject the tufting head which was carried through the article being tufted by being positioned within the recess 10. This completes the tufting operation. It is understood that the needle may be passed through the article being tufted in any direction.

In order to provide for desirable pressure upon the article being tufted and also to provide a gauge in operating the needle, I mount a collar member 24 upon the tubular portion 6 of the needle and provide for its adjustment therealong by means of set screw 25. This operates to gauge the distance to which the needle is moved in passing through the article being tufted and also will engage the surface into which the needle is inserted and permit the article being tufted to be compressed before the tufting head is ejected from the needle in order that the tufting operation may be completed in a proper manner.

The other form of device, illustrated in Figures

8 and 9 includes an elongated needle member 26 having a sharpened point 27 and having a suitable head or handle 28 at the other end. The major portion of the needle body 26 is hollow or in the form of a tube 29, the lower end of which is provided with an elongated opening or aperture 30 of a sufficient size to admit the tufting head of a tufting element previously described. At this point the tubular portion 29 of the body may be enlarged or deflected as indicated at 31 to provide a recess 32 of sufficient size to receive the tufting head within the confines of the needle as a whole. The lower end 33 of the recess where it leads to the needle point 27 is closed permanently. A plunger or rod 34 is slidably mounted in the upper portion of the tubular part 29 of the needle and is normally held in an extended position by means of spring 35. An actuating member 36 in the form of a collar is slidably mounted on the outside of the needle body 26 and operatively connected with the upper portion of plunger or rod 34 so that the plunger or rod may be retracted against the pressure of spring 35, it being understood that this actuating member may be engaged by the fingers of the operator using the appliance. The plunger or rod is of such a length that the lower end 37 thereof extends well within the recess when in extended position, but may be withdrawn entirely from the recess when retracted by actuation of the collar member 36.

This device is used as follows: The tufting head of a suitable tufting element such as previously described, is inserted through the opening or aperture 30 and into the recess 32, the plunger or rod being retracted by the operator so as to permit the tufting head to be placed within the recess 32. This plunger or rod is then released so that the lower end 37 thereof engages one end of the tufting head, the other end of the tufting head being forced against and engaged by the closed end 33 of the recess. This tufting head is therefore held within the recess 32 by means of the pressure of the plunger or rod against the same, and the needle is forced through through a mattress, day bed, upholstery or other article being tufted carrying the tufting head which is positioned within the needle in the recess entirely through the article being tufted. The other tufting head on the tufting element engages the surface of the article being tufted through which the needle is inserted, and when the recess 32 of the needle 26 emerges beyond the other surface of the article being tufted, the plunger or rod 34 is retracted by the operator against the pressure of spring 35 which permits the tufting head which has been located in the recess to be readily pulled or moved out of the recess and to assume its proper position with respect to the article being tufted.

What I claim is:

1. A device for tufting mattresses, upholstery and the like, including in combination an elongated needle element having a sharp point and being hollow for a substantial part of its length, the lower portion of the hollow part of said needle element being flattened and formed with a recess having an opening therinto of sufficient size to slidably receive the stiff, flat tufting head of a tufting element, and a plunger or rod movably mounted in the hollow part of said needle element and adapted to cooperate in the handling of the tufting head and resilient means for normally holding said plunger or rod in a retracted position.
2. A device of the character described, including, in combination, an elongated needle body

having a sharpened point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle and extending through the hollow portion of the needle a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of the recess, and an actuating member associated with said needle for forcing the end of said plunger or rod into said recess so as to eject said tufting head therefrom.

3. A device of the character described, including, in combination, an elongated needle body having a sharpened point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle and extending through the hollow portion of the needle a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of the recess, and an actuating member associated with said needle for forcing the end of said plunger or rod into said recess so as to eject said tufting head therefrom, said needle being provided with an inclined surface at the end of said recess so as to assist in the ejection of said tufting element therefrom.

4. A device of the character described, including, in combination, an elongated needle body having a sharpened point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle and extending through the hollow portion of the needle a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of the recess and an actuating member associated with said needle for forcing the end of said plunger or rod into said recess so as to eject said tufting head therefrom, said needle being provided with a narrow slot communicating with said recess and adapted to receive the material of the tufting element when said tufting head is forced into said recess.

5. A device of the character described, including, in combination, an elongated needle body having a sharpened point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle and extending through the hollow portion of the needle a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of the recess and an actuating member associated with said needle for forcing the end of said plunger or rod into said recess so as to eject said tufting head therefrom, the hollow part of said needle being flattened at said recess so that the recess is narrower and deeper than the normal corresponding dimensions of the needle in order that said recess may receive a stiff, flattened tufting head.

6. A device of the character described, includ-

ing, in combination, an elongated needle body having a sharpened point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle and extending through the hollow portion of the needle a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of the recess and an actuating member associated with said needle for forcing the end of said plunger or rod into said recess so as to eject said tufting head therefrom, the hollow part of said needle being flattened at said recess so that the recess is narrower and deeper than the normal corresponding dimensions of the needle in order that said recess may receive a stiff, flattened tufting head, said plunger or rod having an actuating end shaped to conform to the inside cross sectional shape of the recess.

7. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess.

8. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess, said means including a plunger or rod movably mounted within the hollow part of said needle and means for actuating the plunger or rod so that its end engages said tufting element to force the same out of said recess.

9. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess, said means including a plunger or rod movably mounted within the hollow part of said needle and means for actuating the plunger or rod so that its end engages said tufting element to force the same out of said recess, and resilient means for retracting said plunger or rod.

10. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess, said means including a plunger or rod movably mounted within the hollow part of said needle and means for actuating the plunger or rod so that its end engages said tufting element to force the same out of said recess, said plunger or rod having its lower end pro-

vided with a member conforming in shape to said recess.

11. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess, the hollow body portion being flattened so that the recess is less in width and greater in depth than the normal dimensions of said hollow part so that the recess will receive and enclose a stiff, flattened tufting head.

12. A tufting needle, including, in combination, an elongated needle body having a sharp point at one end and a handle at the other end, said body being provided with a hollow portion having an opening leading into one end thereof adjacent the needle point so as to provide a recess adapted to receive a tufting head of a tufting element, and means for ejecting said tufting head from said recess, the hollow body portion being flattened so that the recess is less in width and greater in depth than the normal dimensions of said hollow part so that the recess will receive and enclose a stiff, flattened tufting head, said hollow portion of the needle being also provided with a restricted slot communicating with the opening in said recess and adapted to receive the material of the tufting element when the tufting head is pushed into said recess.

13. A needle for tufting mattresses, upholstery and the like, including in combination, an elongated needle body having a sharpened point at one end and a hollow body portion, said hollow body portion being provided with an opening leading thereinto and adapted to receive the tufting head of a tufting element, a plunger or rod slidably mounted in said hollow body portion and having its end adapted to be projected into said opening to eject said tufting head therefrom, a trigger member associated with said body portion and operatively connected with said plunger or rod to cause the movement thereof to eject said tufting head.

14. A needle for tufting mattresses, upholstery and the like, including in combination, an elongated needle body having a sharpened point at one end and a hollow body portion, said hollow body portion being provided with an opening leading thereinto and adapted to receive the tufting head of a tufting element, a plunger or rod slidably mounted in said hollow body portion and having its end adapted to be projected into said

recess to eject said tufting head therefrom, a trigger member associated with said body portion and operatively connected with said plunger or rod to cause the movement thereof to eject said tufting head, and resilient means associated with said plunger or rod for retracting the end of the same from said recess.

15. A device of the character described, including, in combination, an elongated needle body having a sharp point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle body, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle body and extending through said hollow portion of the needle body a sufficient distance so that it may be projected into said recess, means for normally holding said plunger or rod in a retracted position out of said recess, said needle body being provided with a narrow slot communicating with said recess and adapted to receive the material of the tufting element when the tufting head is forced into said recess.

16. A device of the character described, including, in combination, an elongated needle body having a sharp point and having a tubular or hollow body portion, a recess provided in said hollow body portion and near the point of the needle body, said recess being adapted to receive the tufting head of a tufting element, a plunger or rod movably mounted in said hollow portion of the needle body and extending through the hollow portion of the needle body a sufficient distance so that it may be projected into said recess, and means for normally holding said plunger or rod in a retracted position out of said recess, said hollow part of said needle body being flattened at said recess so that said recess is narrower and deeper than the normal corresponding dimensions of said needle body in order that said recess may receive a stiff, flattened, tufting head.

17. A device for tufting mattresses, upholstery and the like, including, in combination, an elongated needle element having a sharp point and being hollow for a substantial part of its length, means provided in said needle element for the reception of the tufting head of a tufting element, a plunger or rod movably mounted in said hollow part of said needle element and adapted to cooperate in the handling of the tufting head, and resilient means for holding said plunger or rod in normally retracted position.

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