

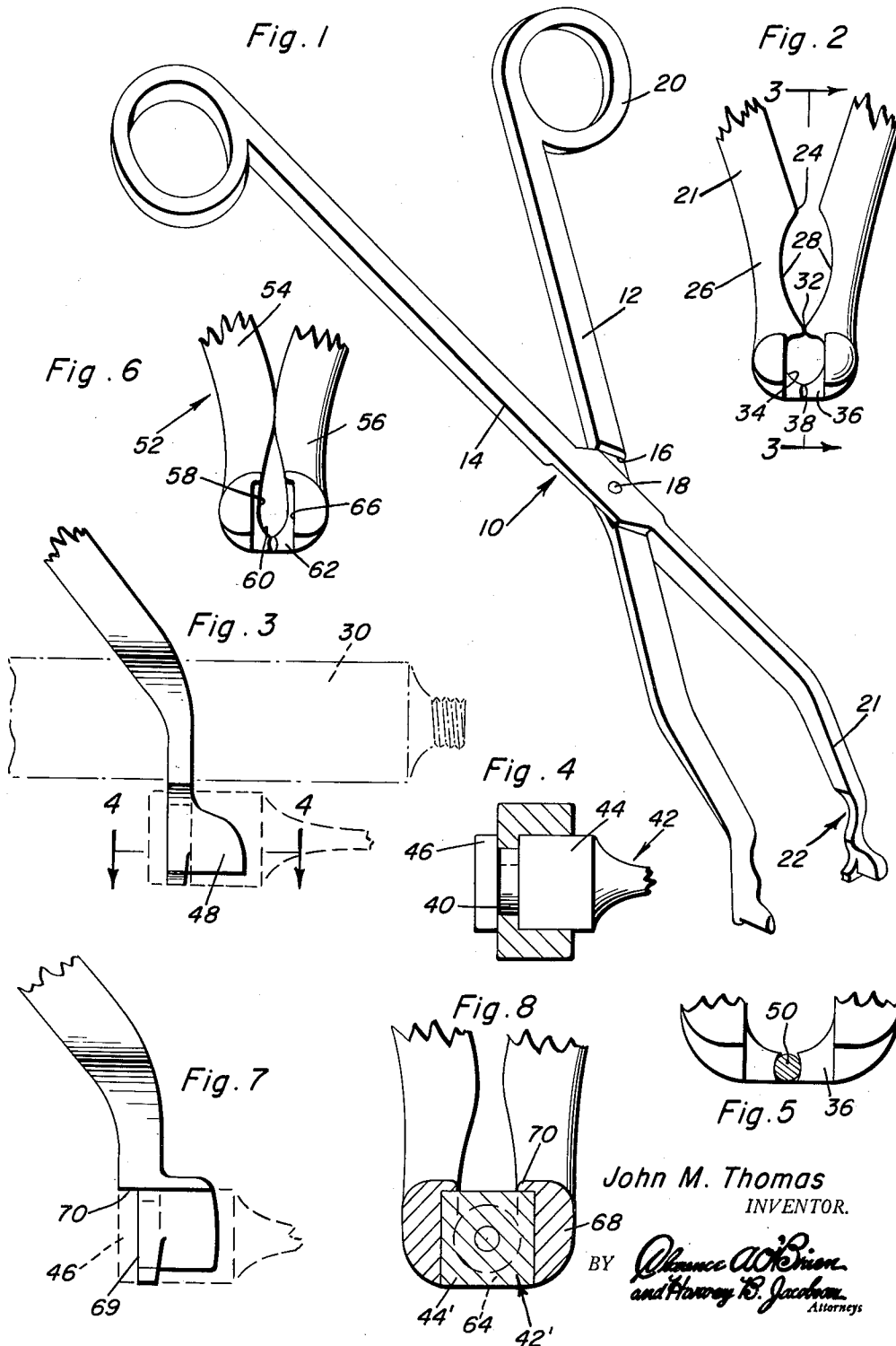
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TOOL FOR HANDLING STERILE ARTICLES

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TOOL FOR HANDLING STERILE ARTICLES

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1 Claim. (Cl. 294—118)

The present invention generally relates to a hand tool and more particularly to that type of tool generally known as forceps or a gripping tong particularly adapted for use in removing sterilized articles from the sterilizer and transferring such articles to a desired position and still maintaining the sterile condition of such articles.

In the administration of inoculations and also the injection of various fluids into the body, a syringe and hypodermic needle is employed and it is absolutely imperative that these elements be sterile. It is also accepted practice to sterilize various instruments employed in surgery and in various other practices in a hospital or a doctor's office. In handling these instruments, it is necessary that the sterile condition thereof be maintained and it is also necessary that a firm grip be provided on such articles to prevent the accidental dropping thereof and also to enable the instruments to be properly employed. Accordingly, it is the primary object of the present invention to provide a tool having novel gripping jaws adapted for firmly and quickly gripping numerous objects such as hypodermic needles, syringes, curved suture needles, small straight needles, various surgical tools and other instrumentalities such as sponges, sterile pads and the like with each object being gripped by the tool being firmly and securely gripped with the article being gripped automatically assuming a position for the best gripping action of the gripping jaws.

A further important object of the present invention is to provide a tool in accordance with the preceding objects in which the gripping jaws are provided with projections arranged for engagement with a reduced portion of a hypodermic needle and also for engaging the polygonal portion of the needle on each side of the reduced portion thereby securely holding the hypodermic needle and also assuring that the needle will not tilt in any direction whatsoever for facilitating the assembly of the needle onto the syringe.

Yet another object of the present invention is to provide a tool in accordance with the preceding objects which is extremely simple in construction, adapted for use in picking up various articles, efficient in its manipulative qualities and yet relatively inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the tool of the present invention showing the same generally in the position that it will be used;

Figure 2 is an enlarged front elevational view of the gripping jaws showing the construction and orientation of the elements thereof;

Figure 3 is a side elevational view of the gripping jaws showing the orientation of the jaws when they are

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in gripping position and showing a hypodermic needle and syringe in phantom;

Figure 4 is a detailed plan sectional view taken substantially upon a plane passing along section line 4—4 of Figure 3 illustrating the manner in which the gripping flanges of the jaws engage the reduced portion of the hypodermic needle;

Figure 5 is an enlarged elevational view of the gripping members for engagement with a small needle;

Figure 6 is a front elevational view of the gripping jaws of a modified form of the tool;

Figure 7 is a side elevational view of the construction of Figure 6; and

Figure 8 is a detailed sectional view showing the orientation of the downwardly facing lips for preventing tilting movement of the hypodermic needle in one direction.

Referring now specifically to the drawings, the numeral 10 generally designates the hand tool of the present invention which incorporates elongated leg members 12 and 14 each of which is provided with a generally centrally disposed cut-out portion 16 where the legs 12 and 14 are crossed and hingedly connected by a hinge pin 18. One end of each of the leg members 12 and 14 is provided with a loop handle 20 for receiving a thumb and finger respectively of one hand for permitting manipulation of the leg members 12 and 14 about the hinge pin 18 and also for manipulation of the tool 10.

The other end of the leg members 12 and 14 is provided with an angularly extending portion 21 together with a gripping jaw generally designated by numeral 22 at the lower end thereof. The gripping jaws 22 are identical and, in fact, each of the leg members 12 and 14 are identical and are of unitary or one-piece construction with the entire device being constructed of material normally employed in tools of this nature.

In describing the jaws 22, reference is made to Figure 2 in which each of the angulated portions 21 extend in converging relation and terminate in spaced points 24. Below this, the angulated portions 21 extend downwardly in a vertical manner with this portion of the leg members 12 and 14 being indicated by the numeral 26. The inner surface of the portions 26 below points 24 are concave as indicated by numeral 28 for gripping large cylindrical objects such as syringes 30 as shown in Figure 3. The axis of the concavity of the concave surface 28 is substantially parallel to the horizontal surface so that the syringes 30 will be generally urged to a position substantially parallel to the bottom of the sterilizer tray. The lower ends of the concave surfaces are rounded as indicated by the numeral 32 and contact each other when the jaws 22 are in adjacent relation. Below the curved points 32, the jaws 22 include a substantially semi-elliptical concave surface 34 which is relatively narrow and curves inwardly and forms shoulders 36 which terminate in their adjacent edges in semi-elliptical concave surfaces 38 whereby the cooperating concave surfaces 34 will clamp the recessed portion 40 of a hypodermic needle generally designated by numeral 42 which includes a square body portion 44 and a square head 46. The shoulders 36 encircle under the reduced portion 40 for securely gripping the reduced portion 40 of the needle 42 substantially as illustrated in dotted line in Figure 4. Projecting outwardly or forwardly from that portion of the jaws 22 immediately adjacent to the concave surface 34 is a lip 48 which terminates above the bottom edge of the shoulders 36 thus assuring that when the bottom edge of the shoulders 36 engage the bottom of the sterilizer tray that the smallest needle may be picked up thereby. The gripping action on a needle of the suture type or of the straight type which is designated by numeral 50 is illustrated in Figure 5

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and due to the specific semi-elliptical shape of the surfaces 38, needles of varying size may be effectively gripped between the surfaces 38.

The concave surfaces 34 may also be employed to grip small syringes and if the syringes are of a diameter greater than the diameter of the area formed by the surfaces 34, these larger size articles will be urged upwardly into the gripping area defined by the surfaces 28 due to the camming action of the rounded points 32. It is noted that the rounded points 32 are such that they fall away rapidly below the point and incline gradually above the point for increasing this effective camming action for urging the larger syringes such as the syringe 30 automatically upward into the concave surfaces 28 for forming an effective grip thereon.

Referring now specifically to Figures 6-8 of the drawings, the numeral 52 generally designates a modified form of the invention including converging legs or angulated end portions 54 and 56 each of which are provided with a concave inner surface 58 extending gradually in diverging relation and then curving sharply inwardly in converging relation as indicated by the numeral 60 thus forming a pair of shoulders 62. The inwardly curving lower edges of the shoulders 62 form the lower portion of a larger recess. The lowermost edge portion of shoulders 62 have concave recesses 64 for gripping small articles. Extending inwardly from the shoulders 62 is a recessed surface 66 in projection 68 which forms a lip 70 at the upper end thereof for engaging the upper surface of the square portion 44' of the hypodermic needle 42'. The rear surface of the shoulders 62 are provided with a recess or cut-out portion 69 forming a continuation of lip 70 for engaging the top surface of the head 46 of the needle 42' thus preventing tilting movement of the needle about a transverse axis for assuring easy assembly of the needle with a syringe. Also, the curvature of the surfaces 58 permits the accurate gripping of various types of articles of various sizes with the recesses 64 forming adequate gripping for engaging the various smaller articles in a secure manner and in a manner which will prevent accidental dropping thereof. Articles having a radius greater than the height of the concave recesses 64 will be cammed upwardly into the larger recess by the lower end of the inwardly curved lower edge portion of the shoulders 62.

It is pointed out that the pivotal type of leg members are shown but it will be understood that the present invention includes the use of the specifically disclosed jaw members and any equivalents thereof in various types of tongs such as the tweezer type or the type having a pivot point at a remote end from the jaws.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A tool for handling sterile articles comprising a pair

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of crossed elongated members, means pivotally interconnecting said members at their point of crossing, one end of each member having a loop handle thereon for receiving the thumb and one finger of a person's hand thereby enabling said members to be moved about the pivotal interconnecting means, the other end of each member having an angulated end portion, each angulated end portion having a longitudinal axis disposed in acute angular relation to an extension of the longitudinal axis of the elongated member thereby enabling the angulated end portions to be disposed vertically in relation to a surface supporting sterile articles and the remainder of the elongated members disposed in acute angular relation thereto, and gripping jaw means on each of said angulated end portions, said jaw means facing each other for gripping engagement with sterile articles, each of said jaw means including a plurality of longitudinally spaced concave recesses disposed directly adjacent each other, the recess nearest said other end of the elongated member being smallest and having the smallest arcuate surface, the recess next adjacent the smallest recess being larger and having a larger arcuate surface, the ends of the elongated member having the smallest recesses therein including lateral projections extending perpendicularly to the elongated members and in parallel relation to each other, each projection including an inner surface, said inner surface including a recess thereon, said recess terminating below the upper edge of the projection thus forming a lip adjacent the top of the projection for engagement with the top of the body of a syringe needle, the rear of the recess in the projection terminating substantially at the rear end of the projection thereby defining a shoulder for reception in the groove of a syringe needle, said shoulder having an inwardly curved lower edge portion defining the lower portion of the larger recess, the smallest recess being defined by a vertically disposed concave recess in the lowermost edge portion of the shoulder, the end of the inwardly curved lower edge portion of the shoulder defining a cam urging articles having a radius greater than the height of the smallest recess upwardly into the larger recess upon inward movement of the angulated end portions of the elongated members.

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