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Patent Application of

For

A FRIENDLY SURGICAL SCALPEL

1. TECHNICAL FIELD OF THE INVENTION

The present invention relates in general to a novel friendly scalpel, which safety functions can meet with medical surgical operation application. More particularly, the present invention pertains to a scalpel which is much simple with ease to attach the new blade and to remove the spent blade from the handle, thereby avoiding the users from percutaneous injuries of the sharps, which can involve contaminated with bloodborne pathogens, such as HIV, HBV, or HCV.....

2: BACKGROUND OF THE INVENTION

Traditional medical scalpels used in current surgical procedures normally comprise a metallic handle with a specifically designed front end to which a blade is attached. The blade is normally attached by sliding its female slot onto a male track located on the front end of the handle. The attachment and the removal of the blade is difficult and often results in injury or in the blade slipping off. Recent advances in this field include the manufacture of disposable handles which allow the user to dispose of the blade and handle without disengaging the blade from the handle. This decreases the chances of injury to the user but the blade remains unprotected and poses a threat to those handling the scalpel after use.

A number of patents and developments disclose medical scalpel or the like having blade protecting features, such as:

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While U.S. Pat. No. 3,306,297--Voorhees is directed to a tracheotomy set, it does describe a scalpel blade mounted on a blade carrier that pivots to fold the blade away. The tracheotomy set can therefore be folded away so that it can be carried around in a pocket for use in emergencies. The blade pivots on a pivot axis that extends transversely to the principal axis of the scalpel blade plane to provide a folding action comparable to that of a penknife with the result that the scalpel blade pivots in the blade plane with a cutting motion. This makes the Voorhees device unsuitable for use as a surgical instrument for regular use. Other developments in this field include blade removing devices which allow a more convenient and safe way of removing the blade from the handle before disposing the blade. These devices are separate from the handle and the user does not always have it on hand when needed. These devices also inflate the costs of scalpels.

Another development in this field includes the use of safety blade sheaths which are fitted to the scalpel handle. The sheaths are flipped or slide in the forward direction to cover the blade after use. Again, these devices are not moulded as an integral part of the scalpel and therefore inflate the costs of the scalpel. They also interfere with the grip of the scalpel.

Some more other developments in this field include the retractable mechanisms engaged with a sliding bar installed within the handle, and a blade can be mounted at the front end of the sliding bar, which allows the blade sliding reciprocally therein, just like the stationery retractable cutter does. Before use, it also needs to use gripper or finger to press the blade at the mounting post of the bar, and then, later after use, the bar to be pushed forward, so that the spent blade will fall down into a waste box. Its weakness are: i: Like conventional scalpel, dangerous to engage the blade with the handle before use; ii: After use, it is not convenience to clear up all attached blood & etc. within the handle body, where a

series of complicated mechanisms is set up within there; iii: It also inflate the costs of the scalpel, not economic for the poorer countries.

In conclusion, the present invention is particularly adapted for preventing the user from contaminated percutaneous injuries of the sharp during thorough surgical operation processes, and which sizes, weight and application way are exactly the same as traditional scalpel with which the users most prefer, and with simple improved structural designs mostly like the ways of existing scalpel easy to manufacture, thereby minimizing the production cost practically for commercially viable, further resulting to achieve minimizing the spread of diseases finally.

3. SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide a friendly medical surgical scalpel which includes a similar surgical blade but of a specific designed slot and a specific handle in association with a movable sliding bar thereon, with which the user is able to avoid from being injured by the sharps within the whole surgical operation process starting from attaching a blade up to the final stage of releasing the spent blade and discard it into a provided waste box afterwards.

According to the most general aspect of the present invention there is provided a friendly surgical scalpel comprising:

(a) a solid scalpel handle with a blade receiving member at distal end, where a convex layer works as a male mounting means is disposed thereon, connected to an angled shoulder, lying with a sliding track along in between the shoulder and the proximal end of the handle, fixed an uplifted lock therewith;

(b) an elongated bar with a pressing post disposed with a pressing means underneath at one end, which is able to slide reciprocally along the sliding track of the handle, and a protective block linked with a serrations located before the pressing post for facilitating reciprocal movement and finger protection function.

(c) a sharp means in different sizes and shapes like assorted traditional surgical blades, characterized in that its mounting slot is specific designed, which sizes and shapes are specifically identical to the male mounting means of the handle, works as a female mounting means for accurate and snug mounting purpose, and to be pressed tightly against the male mounting means by the pressing means of the bar for performing secure surgical operation;

Preferably, an interlocking device acts as a locking means is fixed at the proximal end of the handle, ensuring the sliding bar is locked, so that the sharp means to be pressed tightly against the male mounting means for solid surgical operation upon loading the blade, and later to be unlocked, so as to pull the bar backward for disclosing the blade receiving member to release the spent blade after operation, and to engage with the new blade for next operation.

4. BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings which illustrate a specific embodiment of the invention, but which should not be construed as restricting the spirit or scope of the invention in any way:

FIGS. 1a – 1g are top cross-sectional views illustrating the dismantled parts of an embodiment of a friendly surgical scalpel comprises a solid scalpel handle as per FIG. 1a which includes a handle body, a blade receiving member with a male mounting means at the distal end, connected to an angled shoulder with a sliding track extending towards other end, being fixed with a locking means as per FIG. 1b; a sliding bar as per FIG. 1c which includes a pressing post with a pressing means underneath at distal end, connected to a protective block extending a group of serrations thereon; a surgical blade as per FIG. 1d which includes a specific designed female mounting means ended with a proximal edge; FIG. 1e is a cross-section viewing from proximal end of the scalpel handle; FIG. 1f is a cross-

sectional side view of the locking means; and FIG. 1g is a cross-section viewing at the midst of the bar.

FIG. 2 is a top cross-sectional view illustrating the scalpel handle assembled with the sliding bar within the sliding track of the handle inwardly, stopping its pressing post in the proximity of the angled shoulder disclosing the blade receiving member disposed with a layer of the male mounting means thereon, and simultaneously the locking means is uplifted in unlock status when preparing to receive the blade for surgical operation.

FIG. 3 is a side sectional view illustrating the same status as mentioned in FIG.2.

FIGS. 4a and 4b are enlarged partial side cross-sectional views illustrating the handle when receiving the blade at its blade receiving member, the female mounting means of the blade to be fixed snugly against the identical male mounting means on the blade receiving member, and its proximal edge will be lying tightly and identically against the angled shoulder of the handle for supporting the blade to cut during operation, wherein a series of respective mounting edges along the female mounting means are simultaneously to be fixed snugly against the identical side mounting edges of the male mounting means which also includes a series of mounting blocks, characterized in that the dimension of each mounting block is different with each other connecting together to form a male mounting means, whereby trapping the female mounting means more securely upon surgical operation, and also allow the blade to be released falling off the handle naturally when finishing the operation as shown in partial top cross-sectional views of FIG.4c and FIG.4d, respectively.

FIGS.5-1 to 5-30 are the top cross-sectional views of thirty specific shapes of the female mounting means, characterized in that they are uniquely designed to solve the contradictory problems as follow: (1) easy to load the blade and easy to let the blade fall off the handle naturally; (2) but the blade cannot sway to and fro during operation, so that, the female mounting means is designed by means of its

own assorted supporting edges in association with the pressure from the pressing means of the sliding bar, enabling easy to match snugly with the male mounting means, whereby trapping the female mounting means more securely upon surgical operation, and also allow the blade to be released falling off the handle naturally when finishing the operation.

FIG 6 is a side cross-sectional view illustrating the friendly surgical scalpel is getting for use, wherein the female mounting means of the blade is trapped tightly by means of its own assorted specific edges against the related mounting blocks of the male mounting means on the blade receiving member of the handle and is pressed tightly by the pressing means of the sliding bar with the force support of the angled shoulder, being locked tightly by the locking means which is located at the proximal end of the scalpel.

FIG. 7 is a side cross-sectional view illustrating when after use, the locking means is released by uplifting at the bottom edge of front lock holder, so that the sliding bar can be pulled backward, resulting the spent blade is disclosed, free from the pressing means.

FIG. 8 is a side cross-sectional view illustrating when intending to discard the spent blade, just simply turn over the handle, so that both male mounting means and female mounting means are allowed to separate at its own accord, resulting the spent blade will be loosen falling off into a provided waste box naturally.

Reference Numerals In Drawings:

10 scalpel handle

11 handle body

12 sliding track

13 groove base

14 locking means

141 lock cover

142 front lock holder

143 bottom edge of front lock holder

144 U-shaped side wall

145 screw

146A round holes

146B screw holes

15 angled shoulder (engagement means)

16 blade receiving member

17 male mounting means

171 first mounting block

172 second mounting block

173 third mounting block

174 fourth mounting block

175 fifth mounting block

176 distal mounting edge

177 proximal mounting edge

178 side mounting edges

18 lower protective block

19 lower serrations

20 sharp means

21 female mounting means

211 first mounting edge

212 second mounting edge

213 third mounting edge

214 fourth mounting edge

215 fifth mounting edge

216 distal mounting edge

217 proximal mounting edge

22 proximal edge of the sharp means

30 sliding bar (sliding member)

31 pressing post

32 upper protective block

33 upper serrations

34 bar body

35 pressing means

351 pressing slope

5. DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings, FIGS. 1a – 1g illustrate the top and side cross-sectional views of all dismantled components which make up an embodiment of the novel friendly surgical scalpel comprising a solid scalpel handle 10, a surgical blade 20, and an elongated sliding bar 30 with a locking means 14.

Handle 10 (FIG. 1a) is a solid elongated bar-shaped body 11 having a smaller and thinner blade receiving member 16 disposed with a layer of thinner and narrower convex male mounting means 17 which is connectively composed by a square-shaped first mounting block 171, an elongated second mounting block 172, a smaller square-shaped third mounting block 173, engaging with another elongated fourth mounting block 174 extended to a smallest square-shaped fifth mounting block 175 grouped together with both ends of distal mounting edge 176 and proximal mounting edge 177 located at distal end of handle 10 with a specific distance from a slope-shaped angled shoulder 15 together with an elongated narrower sliding track 12 extending a long groove base 13 flatly and inwardly in U-shape towards the other end, wherein an uplifted locking means 14 which is composed by a crescent lock cover 141, a front lock holder 142 with a small convex bottom edge 143, a pair of U-shaped side wall 144 where two opposite small round holes 146A located therein matched with two identified screws 145 fixed tightly against two opposite screw holes 146B disposed on both

opposite side wall at proximal end of the handle body 11 (FIG.1b), which also includes a convex protective block 18 linked with a series of lower leveled serrations 19 disposed at the bottom surface of handle body 11 in the proximity of blade receiving member 16 for protecting the user's finger and free from slippery during operation as shown in FIG.3.

Sliding bar 30 (FIG. 1c) includes a flat solid bar body 34 in U-shape in accordance with the dimensions of groove base 13, and of the same length as handle 10, having a thinner and smaller spear head look-like pressing post 31 which includes a specific flat pressing means 35 underneath headed with a little declined pressing slope 351 at one end, integrated with a convex protective block 32 extending flatly a series of low leveled serrations 33 until reaching near the midst of bar body 34 for coordinately protecting the user's finger and free from slippery during operation.

Surgical blade 20 (FIG. 1d) is the same as traditional surgical blade in assorted external shapes and sizes including a narrow hollow slot thereon, works as a female mounting means 21, except that its interior cycle-edging structure consists of a pair of first mounting edge 211, a pair of second mounting edge 212, a pair of third mounting edge 213, a pair of fourth mounting edge 214, a pair of fifth mounting edge 215, a distal mounting edge 216, and a proximal mounting edge 217, all of which dimensions are respectively identical to all edges of mounting blocks from 171 to 177 of male mounting means 17, in association with an angled edge 22 at the proximal end of blade 20, which angle is identical to angled shoulder 15 of handle body 11, characterized in that these identical edging structures can allow trapping female mounting means 21 more snugly and securely upon surgical operation, and also allow blade 20 to be released falling off handle 10 naturally when finishing the operation.

FIG. 1e is a cross-sectional view on handle body 11 illustrating that sliding track 12 is disposed with a wider groove base 13 inwardly, thereby allowing sliding bar 30 can be reciprocally moved along within.

FIG. 1f is a side cross-sectional view on locking means 14 which structural details are as mentioned on FIG. 1b.

FIG. 1g is another cross-section view on sliding bar 30 illustrating that its upper surface is narrower than lower base which are identical to the size of sliding track 12 as shown on FIG. 1e.

FIG. 2 is a top cross-sectional view illustrating after uplifting locking means 14, scalpel handle 10 being assembled with sliding bar 30, and by pulling serrations 33 along sliding track 12 of handle body 11, until stopping its pressing post 31 in the proximity of angled shoulder 15 therein, such that blade receiving member 16 and male mounting means 17 to be disclosed, when preparing to receive blade 20 at blade receiving member 16 for surgical operation.

FIG. 3 is a side sectional view illustrating the same status as mentioned in FIG.2, wherein locking means 14 is set free on top of groove base 13, allowing sliding bar 30 to slide to and fro within there freely.

FIGS. 4a and 4b are enlarged partial cross-sectional views illustrating scalpel handle 10 when receiving blade 20, female mounting means 21 of blade 20 to be fixed snugly with ease against the identical male mounting means 17 on the surface of blade receiving member 16, and blade 20's proximal edge 22 will be lying identically and tightly against the foot of angled shoulder 15 which is with same parallel declination angle at A about 55 degree, resulting to create more solid force support during operation.

FIG. 4c and 4d are the top partial cross-sectional views illustrating one way of female mounting means 21 in practical status upon loading blade 20 as mentioned on FIG.4a and 4b to match with male mounting means 17, wherein although second mounting edge 212 and fourth mounting edge 214 of female mounting

means 21 are not identical to the edges of second mounting block 172 and fourth mounting block 174 of male mounting means 17, yet, because other edges such as: proximal mounting edge 217, first mounting edge 211, third mounting edge 213, fifth mounting edge 215 and distal mounting edge 216 of female mounting means 21 in association with proximal edge 22 of blade 20 are identical to proximal mounting edge 177, edges of first mounting block 171, third mounting block 173, fifth mounting block 175 and distal mounting edge 176 of male mounting means 17 in association with the support of angled shoulder 15 of handle body 11 respectively, resulting blade 20 to be easy and snugly to engage on blade receiving member 16 of handle body 11, and then being pressed tightly by pressing means 35 of sliding bar 30 and further interlocked by locking means 14 upon surgical operation, and also allow blade 20 to be released falling off handle 10 naturally when finishing the operation.

FIGS.5-1 to 5-30 are the top cross-sectional views of assorted specific shapes of female mounting means 21 of blade 20 totaling thirty different species of edging formats, which are respectively by means of its different supporting edging forces compulsorily under all of the following specific designed principles in order to ensure all required safety functions to be carried out friendly: (1) distal mounting edge 216 and proximal mounting edge 217 of female mounting means 21 must be identically to touch against distal mounting edge 176 of fifth mounting block 175 and proximal mounting edge 177 of first mounting block 171, respectively; (2) minimum any two mounting blocks ranging from first mounting block 171 to fifth mounting block 175 of male mounting means 17 must be trapped within minimum any two mounting edges ranging from first mounting edge 211 to fifth mounting edge 215 of female mounting means 21; (3) proximal edge 22 of blade 20 against angled shoulder 15 of handle 11 must be matched identically, and (4) certainly must be in association with the pressure from pressing means 35 of

sliding bar 30, which are as shown on the following drawings as for examples: FIG. 5-1: mounting edges of female mounting means 21 from 211 to 217 against all edges of mounting blocks from 171 to 177 of male mounting means 17; FIG. 5-2: mounting edges 212, 213, 214, 216 and 217 of female mounting means 21 against respective edges of mounting blocks from 172 to 174, 176 and 177 of male mounting means 17; FIG. 5-9: mounting edges 211, 215, 216 and 217 of female mounting means 21 against respective edges of mounting blocks 171, 175, 176 and 177 of male mounting means 17; FIG. 5-17: mounting edges 211, 213, 216 and 217 of female mounting means 21 against respective edges of mounting blocks 171 and 173 of male mounting means 17; FIG. 5-25: mounting edges 211, 214, 216 and 217 of female mounting means 21 against respective edges of mounting blocks 171 and 174 of male mounting means 17; FIG. 5-30: mounting edges 214, 215, 216 and 217 of female mounting means 21 against respective edges of mounting blocks 171, 174 and 175 of male mounting means 17, and so on as per other FIGS, thereby creating affordable supporting force to control blade 20 very snugly and steadily lying on blade receiving member 16, engaging and trapping blade 20 more safety and securely upon surgical operation, and also allowing blade 20 to be released falling off handle 11 naturally when finishing the operation.

FIG. 6 is a side cross-sectional views illustrating after blade 20 is engaged on blade receiving member 16 as mentioned on FIGS. 4a to 4d, and FIGS.5-1 to 5-30, sliding bar 30 is pushed forward along sliding track 12 until its pressing post 31 reaches at the extreme distal end of handle body 11 pressing tightly against blade 20 in co-alignment with its pressing means 35 underneath headed with pressing slope 351, and in association with the close of locking means 14, whereby blade 20 is trapped tightly on blade receiving member 16, ensuring blade 20 is assembled firmly for securing surgical operation.

FIG. 7 is a side cross-sectional view illustrating when after use, locking means 14 to be easily uplifted by pushing up bottom edge 143 facing on top of handle body 11, sliding bar 30 is loosen from control, so that sliding bar 30 can be pulled sliding backward, resulting spent blade 20 is set free from pressing means 35.
FIG. 8 is a side cross-sectional view illustrating when intending to discard spent blade 20, user just simply turns over handle 10, so that both female mounting means 21 and male mounting means 17 are allowed to separate at its own accord, resulting spent blade 20 will fall into a provided waste box naturally without necessary to touch it with finger, so that it can safeguard the user to prevent from percutaneous injuries of the sharps, which can involve contaminated with bloodborne pathogens, such as HIV, HBV, or HCV....., and after used, sliding bar 30 to be removed away from handle body 11 by pulling sliding bar 30 backward thoroughly, such that both handle body 11 and sliding bar 30 are very easy to clean up all attached blood etc. and sterile, preparing for next use.

While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not to be limited to the disclosed embodiment, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope the appended claims.

CLAIMS

What is claimed is:

1. A friendly surgical scalpel comprising:

(a) an elongated handle body including a blade receiving member disposed with a male mounting means at one end connected to an engagement means, lying with a sliding track inwardly or outwardly along said handle body extended towards other end, where a locking means is disposed therewith.

(b) a sliding member including a pressing means at one end is adapted to fit within and move reciprocally along said sliding track.

(c) a sharp means including a female mounting means is adapted to fit with said male mounting means identically, together with the support of said engagement means being engaged firmly by said pressing means, enabling the scalpel to perform secure surgical function, and for easy engagement or removal of said sharp means without danger upon releasing said pressing means therein.

2. A friendly surgical scalpel according to claim 1 wherein said male mounting means includes one or a plurality of convex members disposed at said blade receiving member.

3. A friendly surgical scalpel according to claim 1 wherein said female mounting means includes one or a plurality of narrow and hollow slots which is adapted to fit with said male mounting means identically.

4. A friendly surgical scalpel according to claim 1 wherein said pressing means includes one or a plurality of pressing members to engage with said sharp means firmly.

5. A friendly surgical scalpel according to claim 1 wherein said engagement means includes an angled shoulder with the specific declined angle connected to said blade receiving member.

6. A friendly surgical scalpel according to claim 1 wherein said locking means includes one or a plurality of locking members fixed onto, or attached to or within said handle body and said sliding member either apart or combined together which are identical with each other to work interlocking functions.

7. A friendly surgical scalpel according to claim 1 wherein one or a plurality of serrations together with one or a plurality of convex members are disposed on said sliding member and/or said handle body for facilitating reciprocal movements and to protect the user's finger from accidental injury.

8. A friendly surgical scalpel according to claim 1 wherein said sliding member includes a sliding bar made of any material.

9. A friendly surgical scalpel according to claim 3 wherein said female mounting means includes 30 different specific shapes as per the drawings from FIG. 5-1 to FIG. 5-30 attached with this application.

10. A friendly surgical scalpel comprising:
a handle comprising a blade receiving member disposed with a male mounting means, being connected to an engagement means, lying with a sliding track along said handle;
a sliding member includes a pressing post disposed with pressing means is adapted to fit with and move reciprocally along said sliding track;

a sharp means includes one or a plurality of narrow and hollow slots works as a female mounting means which slot shape composed by assorted efficient mounting edges to fit with said male mounting means together with the support of said engagement means, being engaged firmly by said pressing means, enabling the scalpel to perform steady surgical function, and for easy engagement or removal of said sharp means without danger upon releasing said pressing post therein.