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SAFETY DEVICE FOR A SAFETY SYRINGE

1. Field of the Invention

The present invention relates to a safety device for a safety syringe, and more particularly to a safety device which is able to prevent accidental engagement of a hook to a needle hub and to satisfactorily pull the needle hub back into the barrel when required so that the syringe is able to be disposed of safely.

2. Description of Related Art

Numerous patents discussing different structures and means of preventing accidental damage to paramedic personnel by used syringes have already been introduced to the market. Reviewing the patents, most of them concern the means of how the needle is retracted into the barrel. However, in most of the information provided in the available patents, if the user is not careful when trying to receive medicine in the barrel, the plunger prematurely securely engages with the needle hub such that the syringe is no longer useful in injection.

To overcome the shortcomings, the present invention tends to provide an improved safety device for a safety syringe to mitigate and obviate the aforementioned problems.

The primary objective of the present invention is to provide an improved safety device for a safety syringe so that prior to giving the injection the user is able to readily pull the needle hub back into the barrel without worrying that the needle hub is accidentally retracted into the barrel.

In order to accomplish the foregoing objective, the syringe has a barrel, a plunger movably received in the barrel and provided with a hook integrally formed with a stop which is formed on a distal end of the plunger and a spacer deformably formed on a top face of the stop, and a needle hub movably received in the barrel and having a

flange formed on an inner periphery of the needle hub to correspond to the hook. Engagement between the needle hub and the hook enables the needle together with the needle hub to be readily retracted into the barrel so that accidental damage to the paramedic personnel is prevented. Furthermore, because of the deformability of the spacer, engagement of the spacer with the needle hub will not allow the hook to engage with the flange of the needle hub unless a force is applied to deform the spacer, which triggers engagement between the hook and the flange of the needle hub so that the user is able to use the syringe without accidental engagement of the hook with the flange of the needle hub to disable the syringe.

Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

In The Drawings

Fig. 1 is an exploded perspective view showing the parts of the syringe of the present invention;

Fig. 2 is a cross sectional view showing an assembly among the barrel, the needle hub and the plunger;

Fig. 3 is a cross sectional view showing the hook engages with the flange of the needle hub;

Fig. 4 is a cross sectional view showing that the needle hub is retracted back into the barrel by the rearward movement of the plunger; and

Fig. 5 is a schematic view showing that the needle of the needle hub is broken by the forward movement of the plunger.

With reference to Fig. 1, a safety syringe has a barrel (1), a needle hub (2) and a plunger (3).

The barrel (1) is hollow inside to receive therein the needle hub (2) and the plunger (3).

The needle hub (2) is detachably received in the barrel (1) and has a hollow cone (21) and a flange (22) formed on an inner periphery of the hollow cone (21) of the needle hub (2). A needle (23) is replaceably mounted on top of the needle hub (2) so that when necessary, the user is able to replace a damaged needle (23) before use.

The plunger (3) has a thumb push (31) formed on a first distal end of the plunger (3) and a stop (32) formed on a second distal end of the plunger (3) and having a hook (321) integrally formed on a top face of the stop (32) to correspond to the flange (22) of the hollow cone (21). The plunger (3) further has a spacer (33) integrally formed on the top face of the stop (32). The spacer (33) is made of a material with resilience such that the spacer (33) is deformable. Furthermore, the hook (321) extends out of the spacer (33) from the stop (32).

With reference to Fig. 2, when the safety syringe of the present invention is in assembly, the needle hub (2) is first inserted into the barrel (1) so as to secure relative position of the needle hub (2) to the barrel (1). Meantime, the plunger (3) is also received in the barrel (1) to be ready to receive medicine in the barrel (1). From Fig. 2 it is noted that before the syringe of the present invention is in use, the spacer (33) is in engagement with a bottom face of the hollow cone (21) of the needle hub (2) and a free end of the hook (321) is not received in the hollow cone (21), thereby the user can safely use the syringe to receive medicine in the barrel (1) without worrying that the hook (321) might be accidentally in engagement with the needle hub (2) to disable the syringe.

Furthermore, the hook (321) is preferably made of a metal. The hook (321) is bent so that a free end of the hook (321) is resilient relative a distal end securely formed with the stop (32).

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With reference to Fig. 3, when the medicine inside the barrel (1) is ejected out of the barrel (1), the user pushes the plunger (3) all the way into the barrel (1) to force the spacer (33) to deform such that the hook (321) is received in the hollow cone (21). Because of the resilience of the hook (321), the hook (321) is able to engage with the flange (22) of the hollow cone (21). Thereafter the user is ready to pull the needle hub (2) back into the barrel (1).

With reference to Fig. 4, after the needle hub (2) is retracted in the barrel (1), because the free end of the hook (321) is in engagement with one point of the flange (22), the needle hub (2) is inclined relative to the barrel (1). When the needle hub (2) is inclined to and fully received in the barrel (1), a forward movement of the plunger (3) together with the needle hub (2), as shown in Fig. 5, the needle (23) is bent inside the barrel (1) such that the safety syringe of the present invention is able to be disposed of safely.

It is thus noted that the safety device used in the safety syringe of the present invention includes the spacer (33) formed on a top face of the stop (32), the hook (321) formed with the stop (32) and extending out from the spacer (33) and a flange (22) formed on the inner periphery of the hollow cone (21) of the needle hub (2).

With such an arrangement of the safety device of the present invention, the user is able to safely use the syringe to perform an injection and readily pull the needle hub (2) together with the needle (23) back into the barrel (1).

It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent

indicated by the broad general meaning of the terms in which the appended claims are expressed.

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CLAIMS:

1. A safety syringe comprising:

a barrel:

a needle hub movably received in and extending out of the barrel, the needle hub having a needle securely attached to a distal end of the needle hub, a hollow cone integrally formed with the needle hub and having a flange formed on an inner periphery of the hollow cone; and

a plunger slidably received in the barrel and having a thumb press formed on a first distal end of the plunger, a stop formed on a second distal end of the plunger and provided with a hook formed on a free face of the stop and being inclined relative to the free face of the stop, wherein the hook is extended into the hollow cone and abutted against an inner periphery of the flange caused by a forward movement of the plunger relative to the barrel and the needle being deviated from a central axis of the plunger causing the needle hub with the needle to engage an inner periphery of the barrel by the inclined hook in a rearward movement of the plunger relative to the barrel, thereafter the needle is damaged by a second forward movement of the plunger.

2. The safety syringe as claimed in claim 1, wherein the hook is made of metal.

3. The safety syringe as claimed in claim 1, wherein the hook has an inverted V shape.

4. The safety syringe as claimed in claim 3, wherein an apex of the inverted V shaped hook is received in the hollow cone and a free end of the inverted V-shaped hook engages with the flange.

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ABSTRACT

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A safety syringe has a barrel (1), a needle hub (2) movably received in the barrel (1) and having a hollow cone (21) with a flange (22) formed on an inner periphery of the hollow cone (21) and a plunger (3) with a hook (321) formed to correspond to the flange (22) of the needle hub (2). The plunger (3) has a spacer (33) formed on the top face of the stop (32) to be adapted to detachably engage with a bottom face of the hollow cone (21) to keep the hook (321) from engagement with the flange (22). The spacer (33) is made of a material of resilience such that when the spacer is so deformed that the hook (321) engages with the flange (22) so as to pull the needle hub (2) back into the barrel (1).

Fig. 1