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(51) INT CL[5]
A61M 5/32

(52) UK CL (Edition K)
A5R RGG RGM

(56) Documents cited

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WO 89/10767 A	US 5015240 A	US 4978344 A
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(58) Field of search
UK CL (Edition K) A5R RGG RGM
INT CL[5] A61M

(54) Syringe needle or catheter covers

(57) A protective device 60 for a needle 20 of a syringe or catheter has a member 38 within which the needle point can be located. A blocking surface 40 at one end of the member opposes the needle point and has a hole 44 which can be brought into register with the point to allow the needle to extend from the member. The member may be tubular and secured to the syringe by a socket portion 62 formed with resilient bellows 64 or be of a more rigid tubular construction and mounted for telescopic movement over the syringe against the action of a coil spring (Figure 1). In further embodiments (Figures 3-5) the tubular member is mounted on the needle hub and comprises at least one resilient bellows formation. In another embodiment (Figure 6) a resiliently flexible tubular member is filled with low density foam rubber for enhanced resilience. In yet another embodiment (Figure 7) a needle tip protecting cap is attached to the needle hub by a resilient strip.

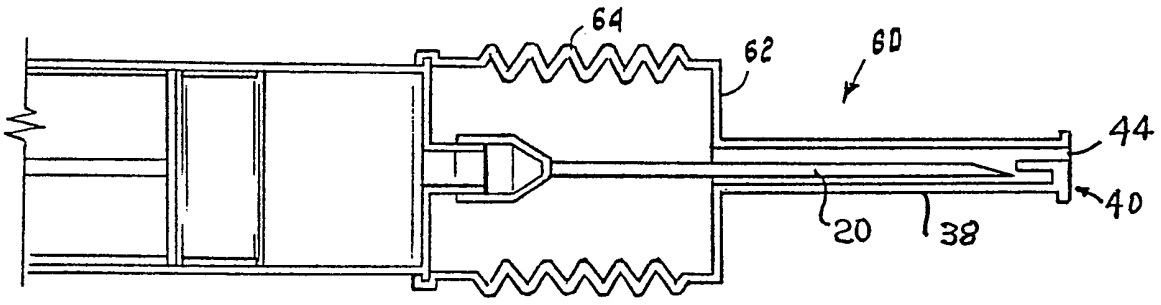

FIG 2

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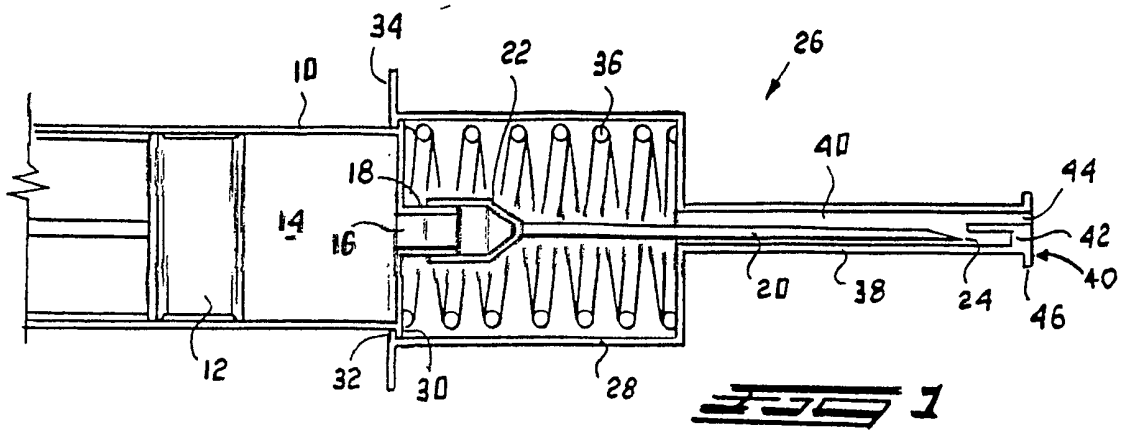
34
22
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28

FIG 1

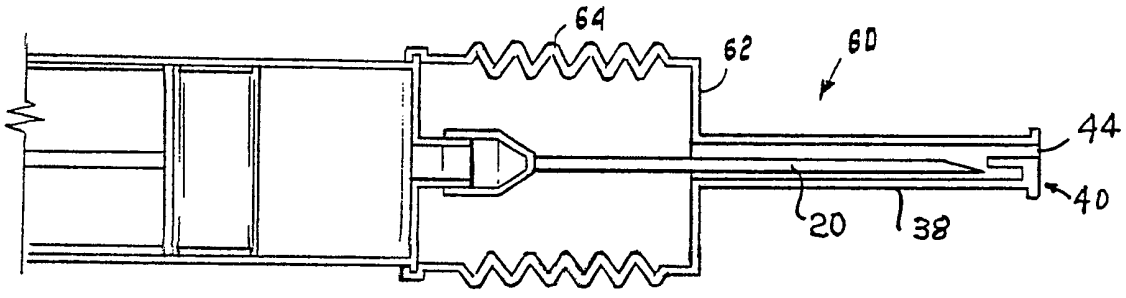
64
62
60
44
40
20
38

FIG 2

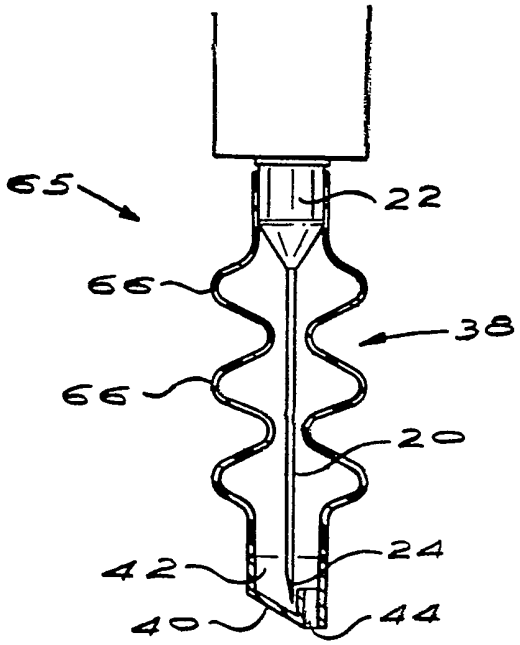

FIG 3

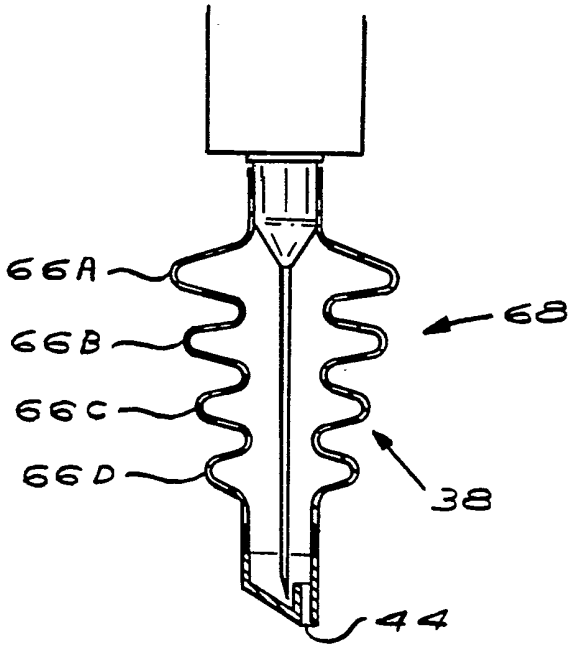

FIG 4

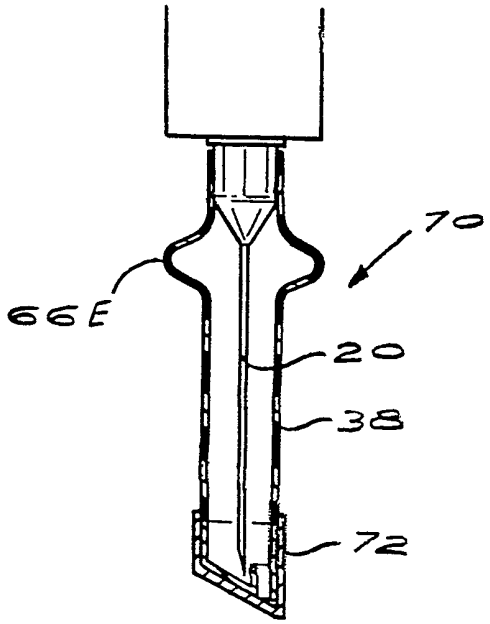

FIG 5

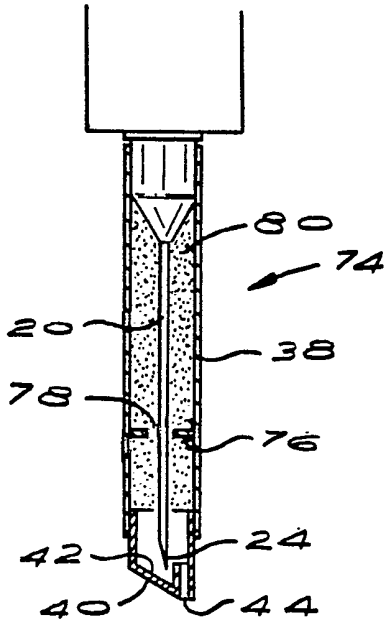

FIG 6

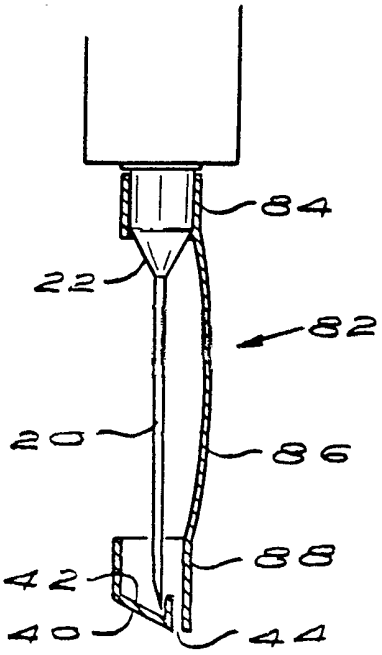

FIG 7

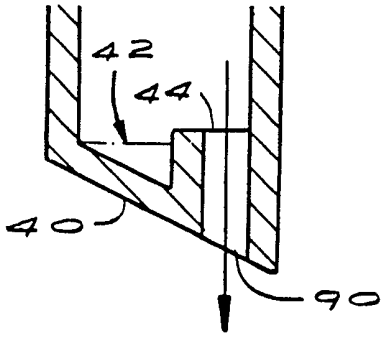

FIG 8

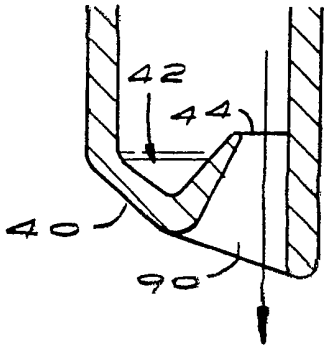

FIG 9

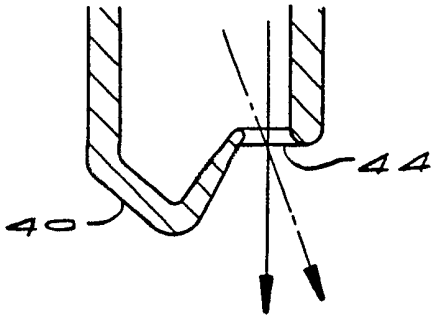

FIG 10

This invention is concerned with a protective device for a needle of a syringe, catheter or similar medical appliance for human or animal use.

The invention provides a protective device for an elongate needle of the kind described which has a base at one end and a point at an opposing end, the device including a blocking surface and means which extends from the base and which supports the blocking surface, the blocking surface having a hole and being movable at least towards the base to allow the needle to extend through the hole.

The device may be provided so that the needle is aligned with the hole, but not extending therethrough. The device is then ready for use. After use the blocking surface is brought automatically or manually to a position at which it opposes the needle point.

Alternatively the device is provided with the blocking surface opposing the needle point and the blocking surface is movable, preferably laterally, relatively to the needle point to bring the hole and the needle point into alignment, and thereby ready the device for use.

The support means may take on any suitable form and may comprise one or more strips of material, which may be resiliently deformable, and which

extend from the base to the blocking surface.

The support means may alternatively include a tubular member within which the needle is located with the blocking surface at one end of the tubular member.

A disc may be located inside the tubular member and may have an aperture through which the needle extends to maintain the needle point out of register with the said hole.

The tubular member may be made from a resiliently deformable and medically acceptable material such as a rubber or plastics material, foam rubber or the like, and preferably is transparent. A deformable filler material such as sponge rubber may be inside the tubular member. Sealing means may be engaged with the tubular member to keep the needle sterile. The sealing means may be a dust cap, or a stopper which fits into the hole, or the like.

The tubular member may include at least one deformable bellows formation which may be near the base of the needle, or may include a plurality of spaced bellows formations of the same or different sizes.

The device may include biasing means which acts against the support

means when the blocking surface is moved towards the base and thereafter acts to extend the support means automatically to its initial position.

The blocking surface may include a recessed formation in the form of a blind or dead-end passage which may oppose or which may be moved so that it opposes the point of the needle and the hole may be formed adjacent the recessed formation. Movement of the needle towards the blocking surface thus causes the point to enter the dead-end passage. The blocking surface is of a material which is sufficiently hard or thick to prevent penetration of the blocking surface by the point. The blocking surface may include surfaces which diverge away from the hole so that when the needle extends through the hole it is completely free of the blocking surface. The recessed formation may surround the hole.

The support means preferably engages directly with the base or hub of the needle but may engage with a syringe or other instrument with which the needle is used.

The blocking surface may be moved laterally and twisted relatively to the needle to bring the hole into register with the point or, conversely, to move the hole so that it is not aligned with the point.

The invention is further described by way of examples with reference to the accompanying drawings in which:

Figures 1 to 7 are side views in cross section illustrating different embodiments of the protective device of the invention, and

Figures 8 to 10 are side views in cross section respectively illustrating in enlarged detail different possible forms of construction which can be embodied in the protective device.

Figure 1 illustrates one end of a known syringe 10 which includes a plunger 12 which is adapted to expel fluid 14 of any appropriate kind through a nozzle 16 formed by a spigot 18. A stainless steel injection needle 20 with a base or hub 22 is frictionally engaged in a leakproof manner with the spigot 18 so that the contents of the syringe are, on activation of the plunger, expelled through a leading end or point 24 of the needle.

A protective device 26 is engaged with the syringe and comprises a housing formed from a clear plastics material which is slightly resiliently deformable. The housing has a socket 28 with a flange 30 which engages with an undercut formation 32 on the socket.

The socket 28 includes two opposed extensions 34 or, alternatively, a continuous flange 34. If manual force is exerted on the formation 34 then the socket can be moved to the left relatively to the syringe. A coil spring 36 inside the socket acts between a right hand end of the socket and an opposing end of the syringe.

The housing includes a tubular member 38 within which the needle 20 is located. At one end the member has a blocking surface 40 with a blind or dead end passage 42 and a hole 44 adjacent the passage 42. Under normal conditions the needle 20 is aligned with the dead-end passage with the point 24 at the mouth of the passage and if the device is moved to the left relatively to the syringe, the point 24 is advanced into the passage.

When the syringe is to be used the member 38 is deflected slightly so that the hole 44 is aligned with the needle point. As an injection is given the needle point penetrates the skin of the recipient. A reaction force is generated on the outer side of the blocking surface and this causes the housing to move to the left relatively to the syringe, against the bias of the spring 36.

When the needle is withdrawn the tubular member automatically moves to the right under the action of the spring. The emerging needle is

therefore fully and automatically enclosed by the tubular member and the natural resilience of the tubular member re-aligns the needle point with the dead-end passage. This minimizes the likelihood of any infection being accidentally transferred via the needle.

Figure 2 shows a device with a housing 60 which has a socket 62 formed with bellows 64 which have a natural resilience resulting from their shape and material. When an injection is given and the member 38 is moved to the left the bellows are compressed. When the needle is removed from the recipient the bellows automatically expand and the tubular member 38 is moved to the right to enclose and protect the needle point.

Figure 3 illustrates a simplified device 65 which comprises a tubular member 38 made from a resilient material such as latex rubber with a plurality of spaced bellows formations 66. At one end the tubular member engages directly with a hub 22 of an injection or catheter needle 20. The point 24 of the needle lies at the mouth of a dead-end passage 42 on a blocking surface 40 at an opposing end of the tubular member. A hole 44 is formed adjacent the passage.

When an injection is to be given the tubular member is pulled slightly in the direction away from the hub and is displaced laterally to align the point 24 with the hole 44. As the needle enters the recipient the member

38 is axially compressed with the formations 66 taking up the movement. When the needle is withdrawn the formations 66 automatically extend the member 38 and the needle is thereby retracted into the member 38 and the point 24 is again aligned with the passage 42.

Figure 4 shows a device 68 which is similar to the device 65 but with bellows formations 66A, 66B, 66C and 66D which are progressively smaller so that the member 38 has a tapered or conical appearance.

Figure 5 shows a device 70 with a single bellows formation 66E and with the remainder of the tubular member 38 being of more or less constant cross section. A removable dust cap 72 encloses the outer end of the member 38 so that the needle 20 is kept in a sterile condition within the member. This tubular member is easier to make than the members of Figures 3 and 4. Instead of the dust cap a stopper can be plugged into the hole 44 to seal the interior of the tubular member.

The devices of Figures 3 to 5 include two components which are secured to one another in any appropriate way, namely the member 38, and the blocking surface which is made from a relatively hard plastics material which the needle point does not readily penetrate. It is preferred to engage the tubular member with the base of the needle but it is possible to fix the member to a syringe or other device with which the needle is

used.

Figure 6 shows a device 74 with a tubular member 38 of regular cross section made from a resiliently flexible material such as foam rubber. A disc 76 is positioned inside the member and has an aperture 78 through which the needle 20 passes. The disc keeps the point 24 aligned with a dead-end passage 42 on the blocking surface 40. The member 38 can be deflected to one side so that the hole 44 is aligned with the point 24 when an injection is to be given.

The interior of the member 38 may optionally be filled with an easily compressible material 80, such as low density foam rubber, to enhance its resilience. Alternatively the resilience can be achieved from the foam rubber 80 alone and the foam rubber can be protected by means of the member 38 which can be made from an impermeable material.

A disc, similar to the disc 76, can also be used with the embodiments of Figures 3 to 5.

Figure 7 shows a device 82 which is made as a one-piece plastics moulding. A ring 84 is engaged with the hub 22 of a needle 20 and at least one strip of material 86 extends from the ring to a member 88 which comprises a dead-end passage 42 and a blocking surface 40 with a hole

44 adjacent the passage 42.

The strip 86 aligns the passage 42 with the point 24. When an injection is to be given the strip is deflected laterally so that the point 24 is aligned with the hole 44. The member 88 is movable along the needle with the strip 86 deflecting outwardly away from the needle as an injection is given. Once the needle is withdrawn the strip 86 returns to its original position under its own resilience and the needle point is withdrawn through the hole 44 and is aligned with the passage 42.

The strip 86 or the member 38 is made from a resilient material so that the needle point is automatically protected after an injection is given. This need not necessarily be the case for the protective device can be made from a material which has a low natural resilience. The onus then rests on the user to cause it to extend so that the needle is brought to a protected position with its point opposing the blocking surface, after an injection has been given.

Figures 8, 9 and 10 illustrate in enlarged cross section different forms of construction for the blocking surface 40. In Figure 8 the blocking surface is inclined to the axis of the needle and the hole 44 adjacent the dead-end passage is defined by a short passage 90 of circular cross section. In Figure 9 the blocking surface is also inclined to the needle but the hole

44 opens into a passage 90 of increasing cross section. In Figure 10 on the other hand the hole 44 does not lead to a passage 90 of the kind shown in Figures 8 and 9. The two latter constructions prevent the point of the needle from inadvertently snagging on the blocking surface.

With the devices of Figures 1 to 7 the point of the needle is not initially aligned with the hole, but rather with the dead-end passage. It is possible, particularly with the embodiments of Figures 3 to 5, to provide the device with the needle point aligned with the hole 44, partly inside the passage 90, and ready for use. After an injection is given the blocking surface can be moved manually so that the needle point opposes the dead-end passage and is then protected. It has also been found that when the needle is withdrawn the compressed bellows expand to such an extent that the needle point is fully retracted from the passage 90 and the resilience of the member then causes movement of the blocking surface so that the point is aligned with the dead-end passage, and is protected. A similar effect is achieved simply by shaking the syringe - the movement extends the tubular member and the needle then moves into alignment with the dead-end passage.

CLAIMS

1. A protective device for an elongate needle with a base at one end and a point at an opposing end, the device including a blocking surface and means which extends from the base and supports the blocking surface, the blocking surface having a hole and being movable at least towards the base to allow the needle to extend through the hole.

2. A protective device according to claim 1 wherein the support means comprises at least one strip of material which extends from the base to the blocking surface.

3. A protective device according to claim 1 wherein the support means includes a tubular member within which the needle is located and the blocking surface is at one end of the tubular member.

4. A protective device according to claim 3 which includes a disc which is located inside the tubular member and which is formed with an aperture through which the needle extends.

5. A protective device according to claim 3 or 4 wherein the tubular member is made from a resiliently deformable material.

6. A protective device according to claim 3, 4 or 5 wherein the tubular member includes at least one deformable bellows formation.

7. A protective device according to claim 1 which includes biasing means which acts against the support means when the blocking surface is moved towards the base.

8. A protective device according to any one of claims 1 to 7 wherein the blocking surface includes a recessed formation which opposes the point and the hole is formed adjacent the recessed formation.

9. A protective device according to any one of claims 1 to 8 which is provided with the needle point aligned with the hole.

10. A protective device according to any one of claims 1 to 8 which is provided with the needle point opposing the blocking surface.

11. A protective device substantially as hereinbefore described with reference to any one of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
9201241.8

Relevant Technical fields

(i) UK Cl (Edition K) A5R (RGG), (RGM)

(ii) Int Cl (Edition 5) A61M

Search Examiner
R J WALKER

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search
10 APRIL 1992

Documents considered relevant following a search in respect of claims 1-10

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
X,P	GB 2243552 A	(TRANSFERTEC LTD) see eg page 13 lines 14-25	1,3, 7-10
X,P	EP 0434008 A	(LAZOVSKI) see Figures 1 and 2	1,2,7,10
X,P	EP 0413872 A	(BOISSON-MULLER) see drawings	1,3-10
X	WO 89/10767 A	(DEEKS) see eg Figures 7 and 8	1,2, 7-10
X,P	US 5015240	(SOOPRONI ET AL) see abstract	1,3,5,6, 7,9,10
X	US 4978344	(DOMBROWSKI ET AL) see Figures 5-7	1,3,6,8, 9,10
X	US 4955866	(COREY) see Figures 8 and 9	1,2,3,4, 9,10
X	US 4892521	(LAICO ET AL) see whole document	1-6,9
X	US 4725267	(VAILLANCOURT) see whole document	1-4, 6-10

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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