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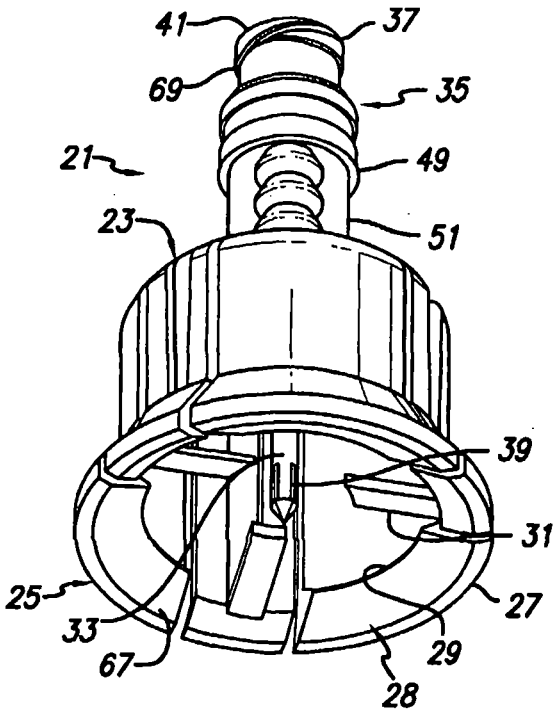
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(54) Title: VIAL ADAPTER HAVING A NEEDLE-FREE VALVE FOR USE WITH VIAL CLOSURES OF DIFFERENT SIZES



(57) Abstract: A vial adapter (21) having a needle-free valve (37), a sharpened cannula (33) used to perforate a vial's rubber stopper, and a circular array of claws (28) of different lengths to engage vial closures of different diameters. The array of claws (28) includes a first set of claws (29) each having a first length extending inwardly from the periphery (27, 67) of the housing (23) of the adapter (21) and a second set of claws (31) alternating with the first set of claws (29) and each having a longer length. The second set of claws (31) are mounted so that they deflect and plastically deform out of the way in the case where the adapter is engaged with a vial that exceeds a predetermined size. The housing (23) includes a shroud (27) that is at least as long as the sharpened cannula (33) to protect medical personnel who use the adapter from inadvertent punctures. The needle-free valve (37) includes a resiliently deformable piston element (45) with a naturally open bore (47) . The interior of the piston provides a fluid flow path through the adapter (21). In one embodiment, the first set of claws (29) of the adapter (21) may be used with a vial closure of at approximately 20 mm in diameter and the second set of claws (31) may be used with a vial closure of approximately 13 to 17 mm in diameter.

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