In recent years there have been a number of attempts made at providing an apparatus of this general type. One of these is disclosed in the present Applicant's United States Patent No. 8,640,744. The present invention seeks to provide an improvement over the apparatus of that United States patent by providing an apparatus, in kit form, which is compact and hence able to be readily stored when not in use, yet is extremely simple to operate, with little physical effort required on the part of the operator. As such, an apparatus in accordance with the present invention lends itself to ready use, regardless of the age, sex and/or physical capabilities of the proposed user.

It is a preferred object of the present disclosure to provide an apparatus for the sealing/resealing and subsequent re-inflation of a damaged and/or deflated inflatable article, in particular a punctured and/or flat tire, which substantially overcomes, if not removes altogether the problems and disadvantages associated with the prior art and/or provides a useful commercial alternative.

SUMMARY

The disclosure provides a simple method of, and apparatus for, sealing or repairing, and then re-inflating, a punctured tire. The apparatus in accordance with the present disclosure, in the form of a kit, is intended to overcome drawbacks and disadvantages associated with existing methods and apparatus. The kit in accordance with the present disclosure is compact (which lends itself to easy storage when not in use), fully reusable and extremely simple and effective to operate.

In accordance with a first aspect of the present disclosure, but not necessarily the broadest aspect, there is provided an apparatus for

repairing and/or inflating of a damaged and/or deflated inflatable article, such as a punctured and/or flat tire, said apparatus including:

a container for receiving and retaining for dispensing, a sealant composition; and

a compressor assembly which is releasably connectable to said container;

wherein said container has associated therewith a valve assembly which allows for controlled dispensing of said sealant composition from said container to said damaged and/or deflated inflatable article;wherein said container is progressively and selectively movable between respective first and second positions/configurations, said first position/configuration when disposed substantially parallel to said compressor assembly, and said second position/configuration when disposed at substantially right angles to said compressor assembly, said first and second positions/configurations corresponding to storage and dispensing positions respectively for said sealant composition from said container, wherein:

said valve assembly has associated therewith a connector assembly including a pivoting or hinging member having a first hollow tube and a second hollow tube associated therewith and extending transversely of a closed end of said connector assembly;

actuation of said compressor when said container is in said first position/configuration allows air flow through the first hollow tube for inflation or re-inflation of said inflatable article; and

actuation of said compressor when said container is in said second position/configuration allows air flow through said second hollow tube for dispensing a mixture of air and sealant composition from said container to said inflatable article.

In a second aspect, the present disclosure provides a kit for repairing and/or inflating a damaged and/or deflated inflatable article, such as a punctured and/or flat tire, said kit including:

a container for receiving and retaining for dispensing, a sealant composition; and

a compressor assembly which is releasably connectable to said container;

wherein said container has associated therewith a valve assembly which allows for controlled dispensing of said sealant composition from said container to said damaged and/or deflated inflatable article;

wherein said container is progressively and selectively movable between respective first and second positions/configurations, said first position/configuration when said container is disposed substantially parallel to said compressor assembly, and said second position/configuration when said container is disposed at substantially right angles to said compressor assembly, said first and second positions/configurations corresponding to storage and dispensing positions respectively for said sealant composition from said container, wherein:

said valve assembly has associated therewith a connector assembly including a pivoting or hinging member having a first hollow tube and a second hollow tube associated therewith and extending transversely of a closed end of said connector assembly;

actuation of said compressor when said container is in said first position/configuration allows air flow through the first hollow tube for inflation or re-inflation of said inflatable article; and

actuation of said compressor when said container is in said second position/configuration allows air flow through said second hollow tube for dispensing a mixture of air and sealant composition from said container to said inflatable article.

The arrangement is such that, when the container for said sealant composition is in its first, storage position or configuration, then actuation of the compressor will only allow for air to be dispensed from the valve assembly. On the other hand, when that same container is pivoted to its

second, in some instances upright dispensing position, activation of the compressor will result in dispensing of sealant composition and air, to be injected into the tire or the like inflatable article.

Suitably, said container includes a main body portion which is closed at one end and has a neck portion extending substantially normally from the other, open end thereof, said neck portion of said container being adapted, in use, to receive and releasably retain said valve assembly.

Suitably, said valve assembly is releasably disposed within said neck

said neck portion of said container.

Suitably, said main body of said connector assembly includes a first passageway extending axially thereof, said first passageway terminating, at one end, with means allowing for releasable connection to said compressor assembly.

Suitably, said connector assembly includes a second passageway, in use to be in flow connection with a lateral substantially tubular extension of said main body of said connector assembly, wherein said lateral extension includes means allowing for releasable connection to a hose, in turn to be releasably connected to said inflatable article.

Further aspects and/or features of the present disclosure will become apparent from the following description.

DESCRIPTION OF THE DRAWINGS

In order that the invention may be more clearly understood and put into practical effect reference will now be made to a preferred embodiment of an apparatus in accordance with the present invention. The ensuing description is given by way of non-limitative example only and is with reference to the accompanying drawings wherein:

Figure 1 is a top perspective view of an apparatus in accordance with the present invention, in its storage configuration;

Figure 2 is a top perspective view of the apparatus of Figure 1, with a case of the apparatus opened to allow for usage of the contents thereof;

Figure 3 is a top view of the apparatus of Figure 1, showing the various components in their stored locations in the case;

Figure 4 is a top perspective view of the overall apparatus in accordance with the present invention, with the container for fluid, such as sealant composition in its operating/dispensing position/configuration;

tube 604 allows fluid communication with the valve assembly 200. As shown for example in Figures 13 and 14 that portion of lesser width of the middle compartment 7 of the case base or bottom section 2 has associated therewith, and extending laterally from opposed sides thereof, nipples 605 and 606 respectively, nipple 605 to allow for releasable connection to the compressor 300, with nipple 606 then allowing for releasable connection to the hose 500. The pivoting or hinging member 602 is adapted, in use, to be located within the portion of lesser width and transversely thereof, in any known manner and using any known methods, as for example pop-rivet 607 or some other form of fixing means.

As shown in, for example, Figures 7 to 12, the valve assembly 200 is adapted, in use, to be located within the neck portion 102 of the container 100. The main body 201 of the valve assembly is adapted in use to be associated with the neck portion 102 of the container 100, with the interposition of an insert 203, which may be constructed of any suitable material, as for example a plastics material. The main body 201 of the valve assembly 200 has extending there through, and preferably substantially centrally thereof, a passage 204.

The main body 201 includes a shaped indent adapted to receive, and releasably retain, suitable sealing means, as for example O-ring type seal 205.

The main body 201 further includes, sited substantially centrally thereof and extending axially thereof, a hollow member 206 in flow connection with the passage 204. The hollow member 206 is sealed at the uppermost end thereof by, suitable sealing means, as for example, an O-ring type seal 207.

When the compressor 300 is actuated, air commences to flow via suitable hosing, and then through the nipple 605. If the container 100 is in the horizontal or storage position, as in Figure 1 for example, such air will be directed through first hollow tube 603 to hose 500 which, if connected to the vehicle tyre, will allow for inflation, or re-inflation thereof. When in this position air cannot be directed to the container 100.

When the container 100, however, has pivoted to its upright position, see for example Figure 7, then it is the second hollow tube 604 of the connector assembly 600 which courses into flow connection with the nipple 605. As the compressor 300 continues to operate, the O-ring seal 205 will be forced relatively upwardly, to allow air exiting the compressor to flow into the container 100, to be mixed with the content thereof. As the procedure continues, then O-ring seal 207 is moved relatively downwardly, allowing a mixture of air and sealant composition to exit the container 100, then to travel into the second hollow tube 604 for passage, via nipple 606, into the hosing, and finally through the tyre valve into the tyre. Operation of the compressor 300 will continue until such time as, firstly, the content of the container 100 has been dispensed/injected into the tyre, and will continue until such time as the tyre is re-inflated to the desired pressure. If over-inflation happens to take place, interruption of operation of the compressor will allow for deflation of the tyre to the required desired pressure.

In similar manner to the earlier described embodiment, in the embodiment of Figure 16 there is provided a connector assembly, generally designated 700, which includes a main body 701, preferably substantially cylindrical in shape. The arrangement is that the neck portion 102 of the container 100 is adapted in use to be associated with the main body 701 of the connector assembly 700, with the interposition of a shaped insert 702 which may be constructed of any suitable material, as for example a

the tire valve and tire.

In other alternative arrangements, such as the embodiments shown in Figures 17 to 24, the top section 2 of the case 1 can be split into two portions symmetrically or asymmetrically such that a first portion 2a of the top section 2 hinges open, relative to the bottom section 3, on a first side of the case 1. For example, the top section 2 can be split asymmetrically such that a first portion 2a of the top section 2 hinges open above the container 100 to allow access to the container 100 to allow progressive and selective movement of the container 100 between the first and second end positons/configurations and to allow replacement of the container 100.

In some preferred arrangements, a second portion 2b of the top section 2 is configured to not hinge open. In such arrangements, second portion 2b is attached to the bottom section 3 via one or more fasteners, such as clips or buckles, e.g. made of suitable plastics material. Configuring the second portion 2b of the top section 2 to not hinge open prevents users accessing the compressor 300 in normal use.

Examples of suitable hinges 12 for hingedly attaching one or more top sections 2a, 2b of the case to the bottom section 3 of the case of the apparatus are shown in Figures 17A and 17B. Hinges 12 are formed separately for coupling to apertures in one or more top sections 2a, 2b of the case and to apertures in the bottom section 3 of the case 1.

In such alternative arrangements, the first portion 2a of the top section 2 can comprise an aperture 14 through which the container 100 can be viewed whilst the first portion 2a of the top section 2 is still closed. It is therefore possible to view at a glance that the container 100 is present in the case 1. Where the container 100 is formed of a transparent material, it is also possible to view at a glance that the container 100 comprises a sufficient quantity of the sealant composition. The aperture 14 is

CLAIMS:

1. An apparatus for repairing and/or inflating a damaged and/or deflated inflatable article, such as a punctured and/or flat tire, said apparatus including:

a container for receiving and retaining for dispensing, a sealant composition; and

a compressor assembly which is releasably connectable to said container;

wherein said container has associated therewith a valve assembly which allows for controlled dispensing of said sealant composition from said container to said damaged and/or deflated inflatable article;

wherein said container is progressively and selectively movable between respective first and second positions/configurations, said first position/configuration when said container is disposed substantially parallel to said compressor assembly, and said second position/configuration when said container is disposed at substantially right angles to said compressor assembly, said first and second positions/configurations corresponding to storage and dispensing positions respectively for said sealant composition from said container, wherein:

said valve assembly has associated therewith a connector assembly including a pivoting or hinging member having a first hollow tube and a second hollow tube associated therewith and extending transversely of a closed end of said connector assembly;

actuation of said compressor when said container is in said first position/configuration allows air flow through the first hollow tube for inflation or re-inflation of said inflatable article; and

actuation of said compressor when said container is in said second position/configuration allows air flow through said second hollow tube for dispensing a mixture of air and sealant composition from said container to

said inflatable article.

2. The apparatus as claimed in claim 1, wherein said container includes a main body portion which is closed at one end and has a neck portion extending substantially normally from the other, open end thereof, said neck portion of said container being adapted, in use, to receive and releasably retain said valve assembly.

3. The apparatus as claimed in claim 2, wherein said valve assembly is releasably disposed within said neck portion of said container and is adapted to be in flow connection with said compressor assembly.

4. The apparatus as claimed in claim 3, wherein said valve assembly includes a main body adapted to be releasably connected to said neck portion of said container.

5. The apparatus as claimed in claim 4, wherein said main body of said valve assembly includes shaped indents or grooves each adapted to receive and releasably retain therewithin a sealing means.

6. The apparatus as claimed in claim 4 or 5, including a hollow member protruding substantially normally from an upper face of said main body of said valve assembly which is sealed at its uppermost end by a sealing means.

7. The apparatus as claimed in claim 6, wherein said hollow member forms part of a shaped insert interposed between said valve assembly and said neck portion of said container.

8. The apparatus as claimed in claim 7, wherein said main body of the valve assembly has extending there through, and preferably substantially centrally thereof, a passage in flow connection with said hollow member.

9. The apparatus as claimed in any preceding claim, including a pair of nipples

extending laterally from opposed sides of respective dividers of a case for housing said apparatus, a first of said pair of nipples allowing for releasable connection to said compressor assembly and a second of said pair of nipples allowing for releasable connection to a hose, in turn to be releasably connected to said inflatable article.

10. The apparatus as claimed in claim 2, wherein a connector assembly associated with said valve assembly includes a main body adapted to be releasably connected to said neck portion of said container.

11. The apparatus as claimed claim 10, wherein said main body of said connector assembly includes a plurality of threads of a complimentary shape to a plurality of threads on said neck portion of said container, extending along at least part of an axial dimension thereof.

12. The apparatus as claimed in claim 10 or 11, wherein said main body of said connector assembly includes a first passageway extending axially thereof, said first passageway terminating, at one end, with means allowing for releasable connection to said compressor assembly.

13. The apparatus as claimed in claim 12, wherein said connector assembly includes a second passageway, in use to be in flow connection

with a lateral, substantially tubular extension of said main body of said connector assembly, wherein said lateral extension includes means allowing for releasable connection to a hose, in turn to be releasably connected to said inflatable article.

14. The apparatus as claimed in any one of claims 10 to 13, wherein said main body of said connector assembly includes shaped indents or grooves each adapted to receive and releasably retain therewithin a sealing means.

15. The apparatus as claimed in claim 13, wherein actuation of said compressor assembly when said container is in said second position/configuration allows air flow through said first and second passageways for dispensing a mixture of air and sealant composition from said container to said inflatable article.

16. The apparatus as claimed in any preceding claim, including a switch, such as an electrical micro-contact switch, the activation of said switch allows said compressor assembly to function, and thereby allow for discharge of sealant composition from said container, only where said container is in said second position/configuration.

17. The apparatus as claimed in claim 16, wherein said switch is activated by moving said container to said second position/configuration.

18. The apparatus as claimed in any one of claims 1 to 5, wherein said valve assembly includes an aluminium induction seal.

19. The apparatus as claimed in any preceding claim, wherein said compressor assembly has associated therewith means allowing for connection to a source of power, said connection means being in the form of a retractable cord or power conduit, said cord or conduit having, at one end thereof, adaptor means allowing for connection to a source of electrical energy/power.

20. A kit for repairing and/or inflating a damaged and/or deflated inflatable article, such as a punctured and/or flat tire, said kit including:

a container for receiving and retaining for dispensing, a sealant composition; and

a compressor assembly which is releasably connectable to said container;

wherein said container has associated therewith a valve assembly which allows for controlled dispensing of said sealant composition from said container to said damaged and/or deflated inflatable article;

wherein said container is progressively and selectively movable between respective first and second positions/configurations, said first position/configuration when said container is disposed substantially parallel to said compressor assembly, and said second position/configuration when said container is disposed at substantially right angles to said compressor assembly, said first and second positions/configurations corresponding to storage and dispensing positions respectively for said sealant composition from said container, wherein:

said valve assembly has associated therewith a connector assembly including a pivoting or hinging member having a first hollow tube and a second hollow tube associated therewith and extending transversely

of a closed end of said connector assembly;

actuation of said compressor when said container is in said first position/configuration allows air flow through the first hollow tube for inflation or re-inflation of said inflatable article; and

actuation of said compressor when said container is in said second position/configuration allows air flow through said second hollow tube for dispensing a mixture of air and sealant composition from said container to said inflatable article.

21. The kit as claimed in claim 20, including a case for housing said container and said compressor assembly, said case comprising a top section hingedly connected to a bottom section.

22. The kit as claimed in claim 21, wherein said top section comprises one or more of the following: a) an aperture through which said container can be viewed; an aperture through which a pressure gauge can be viewed; a recess for accommodating an on/off switch for said compressor assembly.

23. The kit as claimed in claim 21 or 22, wherein said top section comprises a cavity or recess for receiving therein an adaptor means of a means allowing for connection to a source of power.

24. The kit as claimed in any one of claims 21 to 23, wherein said top section of said case is split into at least two portions, at least one of said two portions of said top section hingedly connected to said bottom section and openable above said container to allow access to said container.

25. The kit as claimed in any one of claims 21 to 24, wherein said bottom section of said case comprises a recess for accommodating at least part of a hose to be releasably connected to said inflatable article.

26. The kit as claimed in any one of claims 20 to 25, including a cradle having a pair of nipples allowing for releasable connection to said compressor assembly and for releasable connection to a hose, in turn to be releasably connected to said inflatable article.

27. The kit as claimed in any one of claims 20 to 26, wherein said connector assembly associated with said valve assembly includes a main body adapted to be releasably connected to a neck portion of said container wherein said first and second hollow tubes are aligned vertically, or substantially vertically and spaced apart vertically, or substantially vertically, relative to said main body.