

(21) Application No: **2218637.3**  
 (22) Date of Filing: **12.12.2022**

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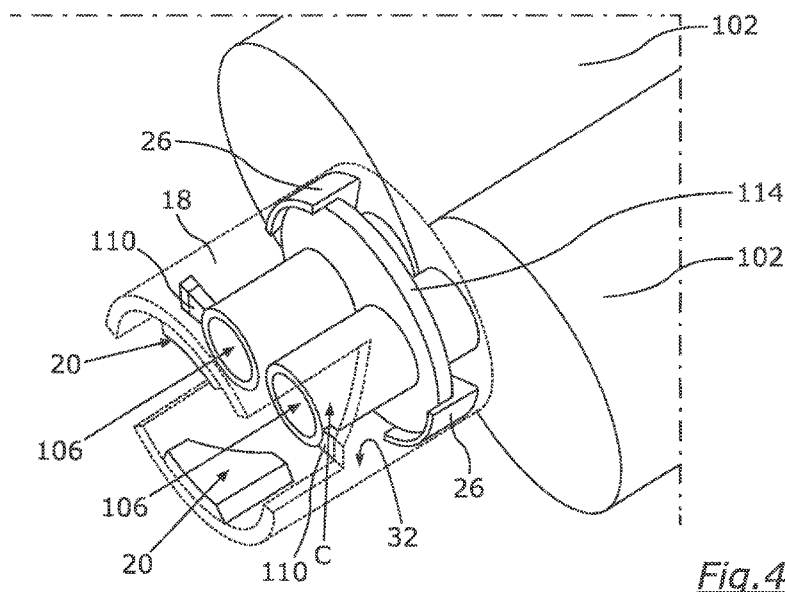
(51) INT CL:  
**B05C 17/005** (2006.01)

(56) Documents Cited:  
**WO 2007/003063 A1 US 20170182511 A1**  
**US 20070175921 A1 US 20070090079 A1**  
**medmix, 28 April 2022, "medmix upgrades its F-System with the 100% recycled greenLine bayonet ring", medmix.swiss, [online], Available from: <https://www.medmix.swiss/News/2022-04-28-medmix-upgrades-its-F-System-with-greenLine-bayonet-ring> [Accessed 7 June 2023]**

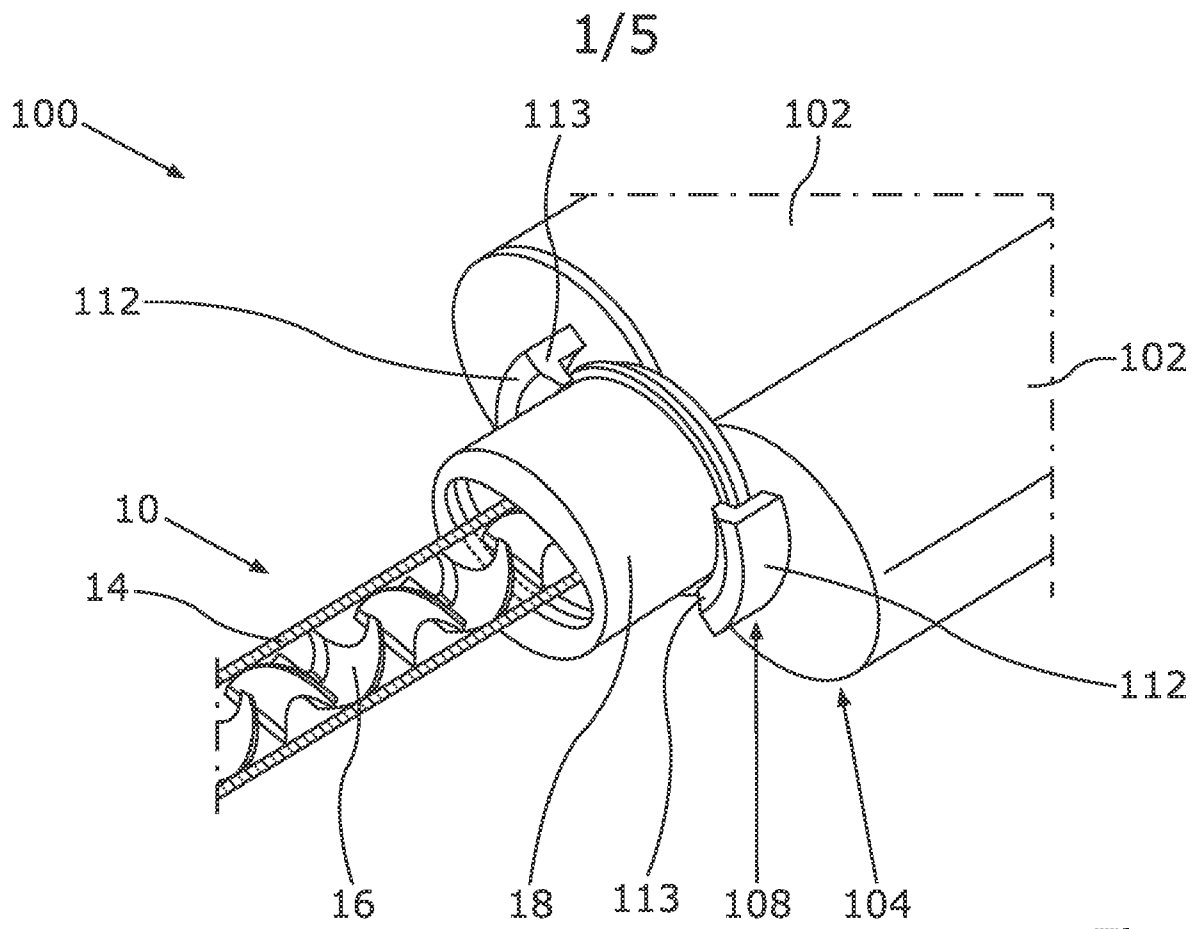
(58) Field of Search:  
 INT CL **B05C**  
 Other: **WPI, EPODOC, Patent Fulltext, INTERNET**

(54) Title of the Invention: **Mixer, cartridge and assembly**  
 Abstract Title: **Mixer with elliptical retaining ring**

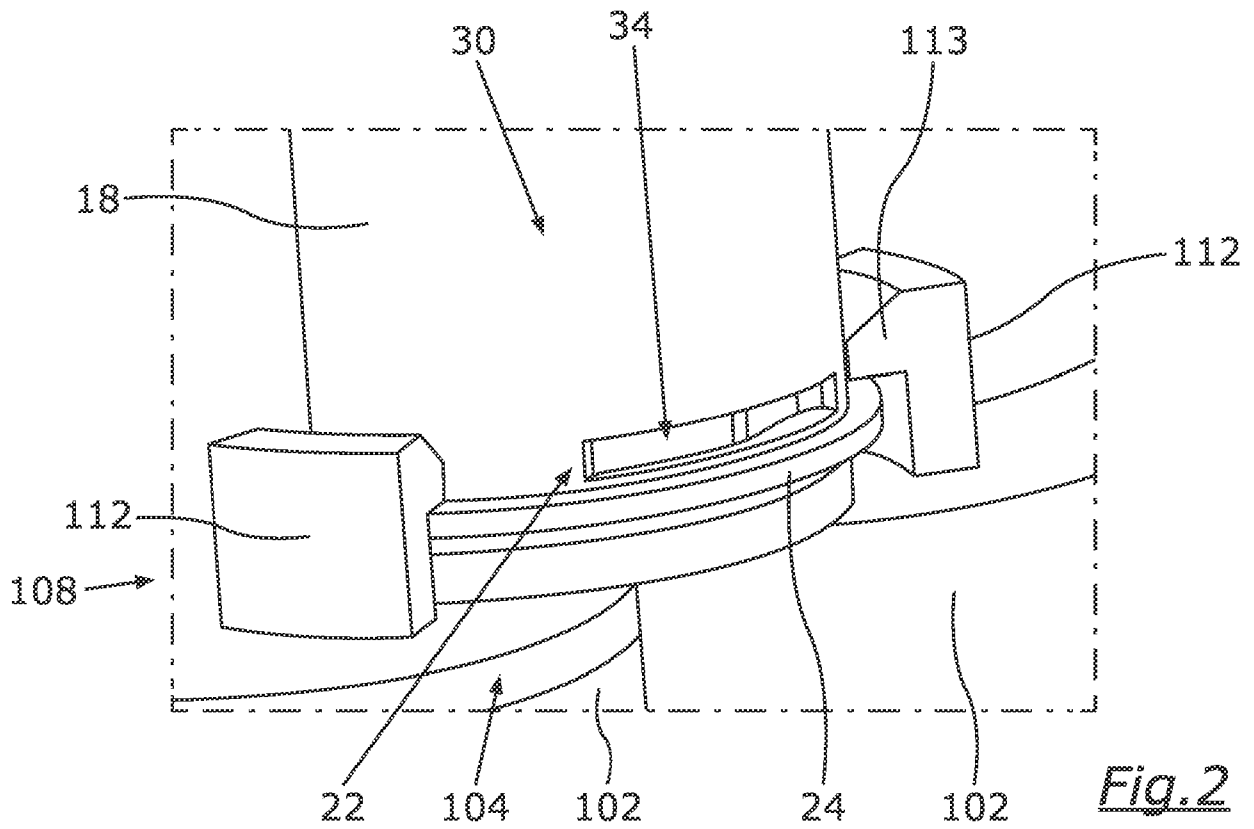
(57) Mixer for mixing two components comprises at least one inlet (12, figure 6) and a retaining ring 18 for connecting to a cartridge 102, wherein the retaining ring comprises guiding means 20 extending spirally along an inner surface 32, the guiding means configured to guide the retaining ring 18 when the mixer is connected to or detached from the cartridge and wherein the retaining ring comprises an elliptical outer and/or inner shape. The elliptical shape may be provided by a protrusion 28. The retaining ring may be rotatable and comprise connection means (22, figure 2) e.g. bayonet, threaded, snap fit. The retaining ring may comprise a retaining element 26 configured to axially fix it. A cartridge for storing material comprises at least one cartridge container 102, a head part (104, figure 3) comprising at least one outlet 106 with a protrusion 110 configured to connect to a mixer.



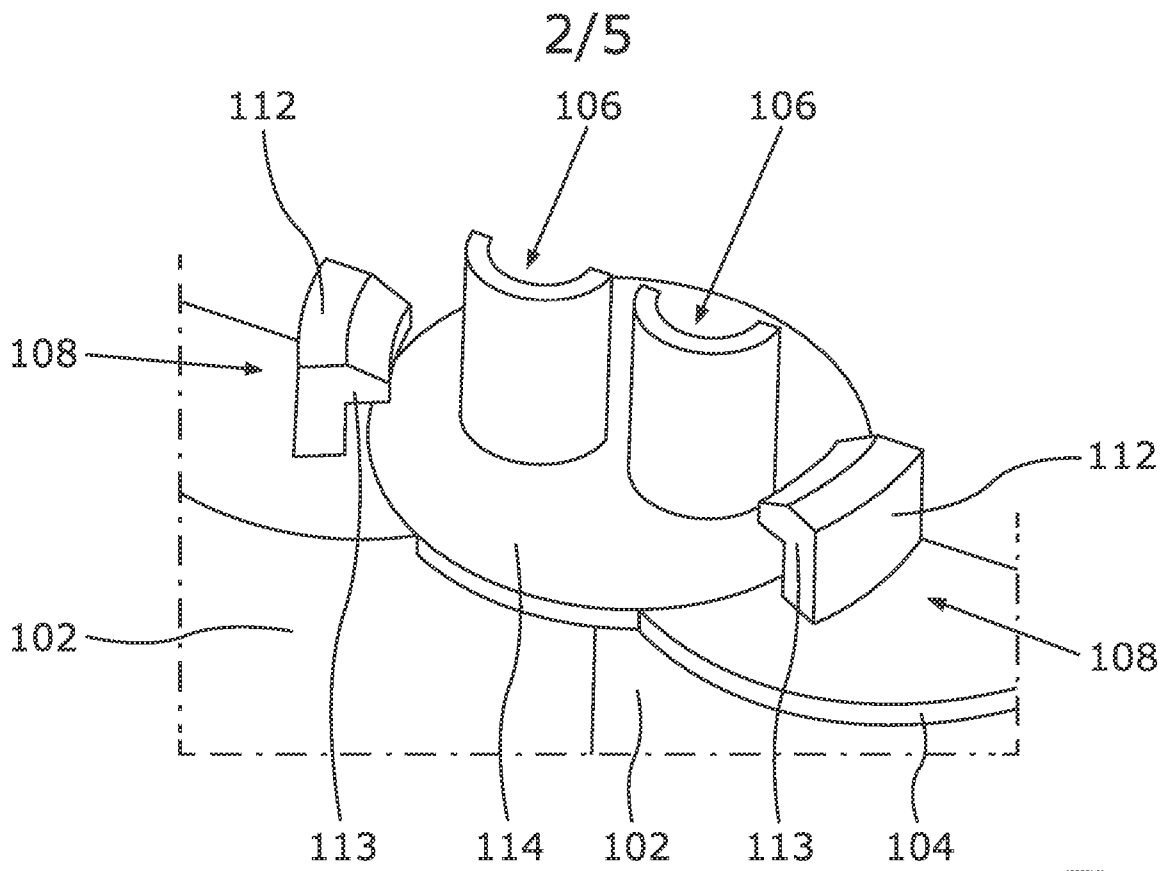
06 04 23



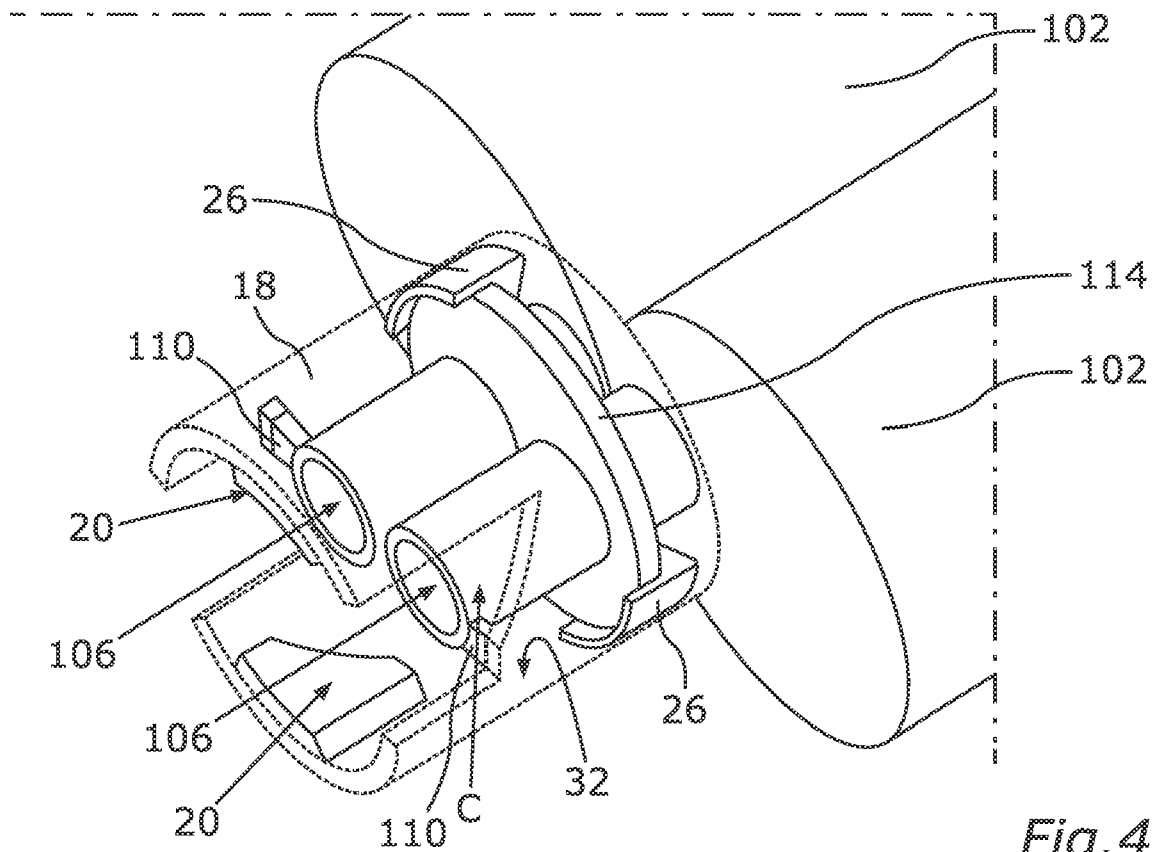
*Fig. 1*



*Fig. 2*



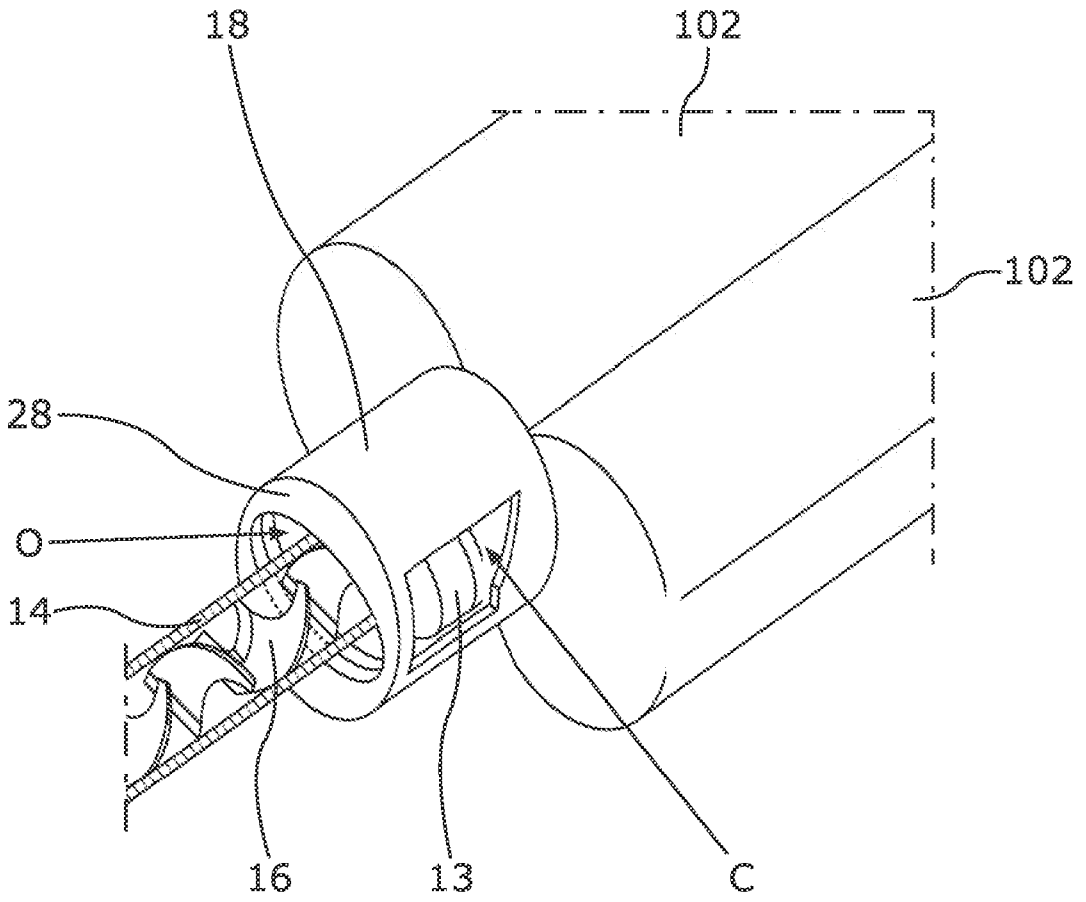
*Fig. 3*



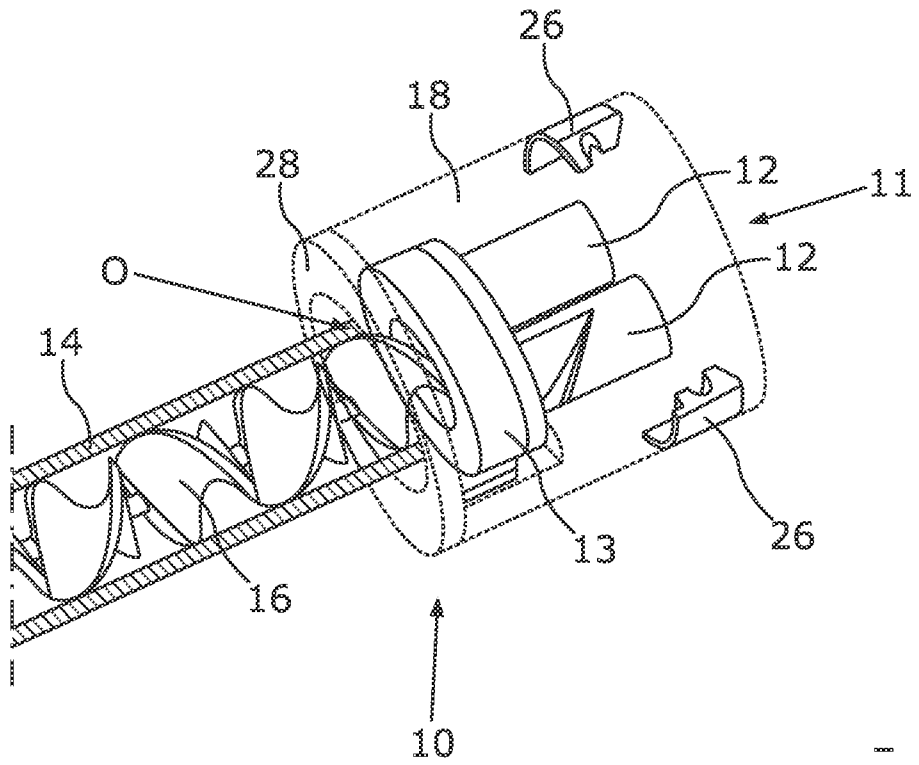
*Fig. 4*

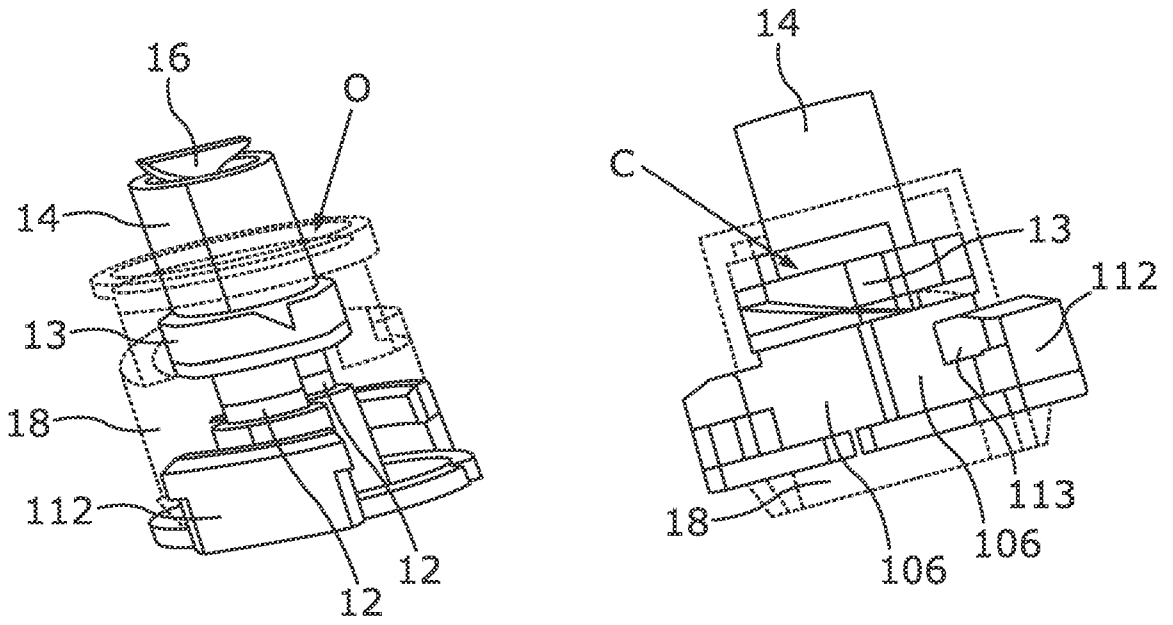
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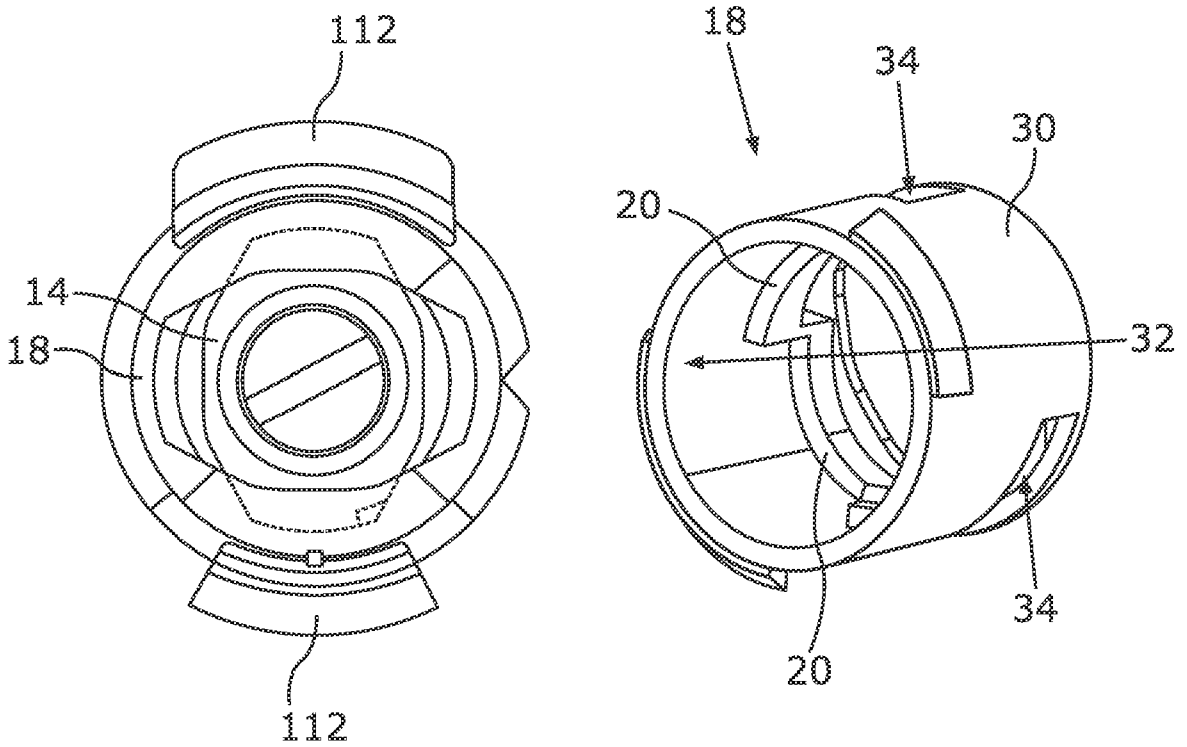


*Fig. 5*





*Fig. 7*



*Fig. 8*

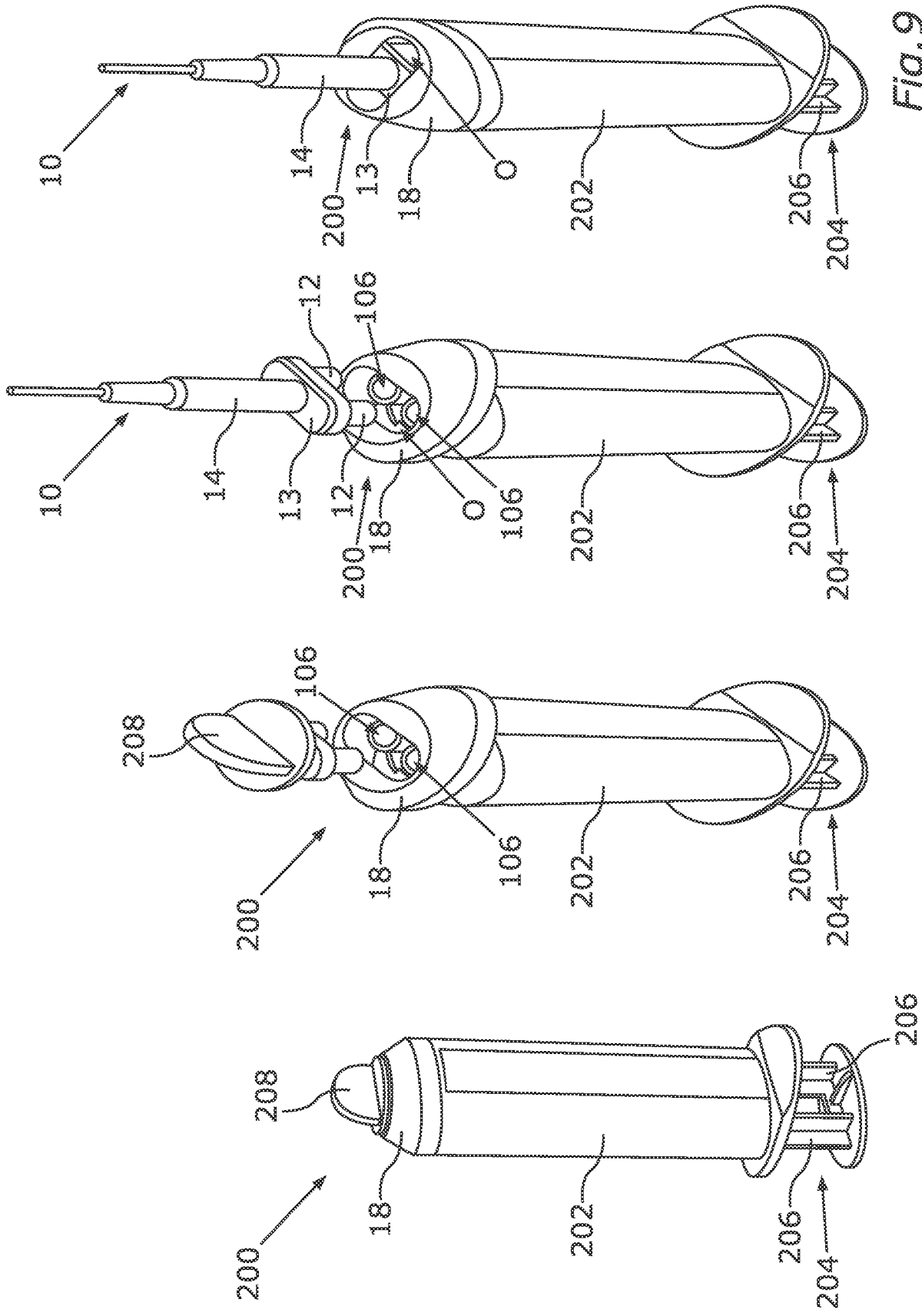


Fig. 9

### **Mixer, Cartridge and assembly**

The invention relates to a mixer for mixing two components with one another, to a  
5 cartridge for storing a material to be dispensed and to a cartridge assembly  
configured to store, mix and dispense materials.

In a great variety of different application fields ranging from the medical and dental  
sector, for example, up to the industrial sector, dispensers for materials are used  
10 that comprise at least one cartridge in which the materials to be dispensed are  
stored.

Furthermore, as often two-component materials are used, which need to be stored  
separately from one another, such dispensers comprise additional mixers which  
15 are configured to mix the materials with one another. Such mixers are  
conventionally attached to the respective cartridges such that the materials that  
exit the cartridges directly flow into the mixer which then mixes the materials with  
one another before they are being dispensed out of the dispenser.

20 Depending on what kind of materials are supposed to be dispensed it can be  
necessary to provide different kind of mixers as for example the mixing ratio may  
vary.

Hence, it is not only necessary to provide a way with which a mixer can easily and  
25 at the same time safely be connected to the respective cartridge, but also to  
ensure that only the right mixers can be attached to certain predetermined  
cartridges.

So far, conventionally known mixers and cartridges either provide a way to easily and safely connect the two components with one another, or they provide a way to easily distinguish between the different types of mixers and/or cartridges.

- 5 It is therefore an object of the invention to provide a mixer, a cartridge and a cartridge assembly which combine the above mentioned tasks in a simple manner. This object is solved by the subject matter of the independent claims.

That is, according to a first aspect of the invention a mixer for mixing two  
10 components with one another is provided with the mixer comprising at least one inlet for receiving the two components and at least one outlet arranged at an opposite end of the mixer for dispensing the mixed components. The mixer according to the invention further comprises a mixer housing extending along a longitudinal axis between said inlet and said outlet and a mixing element with the  
15 mixing element being arranged inside the mixer housing.

In this connection it should be noted that in view of the invention it is not important whether the mixer housing completely surrounds the mixing element or only partially such that the mixing element extends beyond the mixer housing at the  
20 inlet and/or at the outlet side of the mixer.

The mixer housing further comprises a retaining ring arranged at the at least one inlet of the mixer with the retaining ring being configured to be connected to a cartridge. According to the invention the retaining ring can either be a part of the  
25 housing, i.e. a part that is fixedly connected to the housing in at least one direction, e.g. in the longitudinal direction. Alternatively, it can also be possible that the retaining ring is provided and connected to the mixer housing upon connection of the mixer to the cartridge. Furthermore, it can be possible that the retaining ring can be movably coupled to the housing. For example, the retaining ring can be



rotatably and/or axially (along the longitudinal axis) movably coupled to the housing.

Furthermore, said retaining ring comprises guiding means at an inner surface thereof with said guiding means extending essentially spirally along said inner surface of the retaining ring. The guiding means are configured to guide the retaining ring when the mixer is connected to or detached from said cartridge. Such guiding means according to the invention can for example be configured as ramps, grooves, ribs and/or combinations of the foregoing that are configured to guide the retaining ring and thus the mixer towards to or away from the cartridge. The cartridge to which the mixer is supposed to be attached to can also comprise corresponding receiving means which allow the retaining ring to functionally interact with the receiving means of the cartridge to allow an easy connection and/or removal of the mixer.

Additionally, the retaining ring comprises an elliptical outer and/or inner shape. By providing the retaining ring with an elliptical inner and/or outer shape it can be easily ensured that the user knows how to align the retaining ring – and hence the mixer – with respect to the cartridge. Hence, an elliptical inner and/or outer shape can provide an alignment support for the user.

According to a first embodiment of the invention said retaining ring is fixedly connected to the mixing element and/or the mixer housing. Nevertheless, the retaining ring can generally still be movable, e.g. rotatable, with respect to the mixing element and/or the mixer housing.

Alternatively it can also be possible that the retaining ring is releasably couplable to the mixer. This can for example be the case when the retaining is part of the cartridge by being pre-mounted on the cartridge or when the retaining ring is a separate element that is only used upon connection of the mixer to the cartridge.

In the latter case a retaining ring can for example be used for a variety of cartridges by being reused.

5 According to a further embodiment the retaining ring is further rotatable with respect to the mixing element. A rotatable retaining ring can for example allow an easier handling upon connection and/or detachment of the mixer to/from a cartridge. That is, by rotating the retaining ring the guiding means ensure that the mixer is easily connected to respectively detached from the cartridge.

10 According to a further embodiment the retaining ring further comprises connection means configured to connect the mixer to said cartridge. Said connection means can for example be provided at the inner surface of the retaining ring. Alternatively, it could also be possible that the connection means are provided at a side of the retaining ring facing the cartridge upon connection of the mixer to the cartridge.

15

The connection means can be at least one of a bayonet connection, a threaded connection, a snap fit connection and/or combinations of the foregoing. Hence, every kind of easy to handle connection can be chosen for the connection means to allow the user an effortless handling of the mixer.

20

Furthermore, it can also be possible that the connection means are configured to connect the mixer to said cartridge by a rotation of the retaining ring selected in the range of 10 to 90°. In this connection the retaining ring may either rotate on its own, i.e. by being rotatable with respect to the mixing element and the mixer  
25 housing, or it may rotate together with the mixing element and/or the mixer housing by being immovably connected to thereto.

25

According to a further embodiment the retaining ring comprises a web extending circumferentially along an outer surface of the retaining ring and with said web  
30 being configured to fix the retaining ring axially with respect to said cartridge upon

30

connection of the two. Said web can either extend along the complete circumference of the retaining ring or only along a part of it. Furthermore, it could also be possible that the web is divided into two or more sub-webs which extend along the circumference of the retaining ring.

5

According to a further embodiment the retaining ring further comprises at least one retaining element at the inner surface thereof configured to fix the retaining ring axially with respect to said cartridge upon connection of the two. The retaining element can also be a part of the connection means mentioned above or it can be a separate element. In either case, the retaining element is configured to axially fix the retaining ring with respect to the cartridge.

10

According to a further embodiment the retaining ring comprises a circumferential protrusion at an end remote from the inlet of the mixer that surrounds the mixing element. Such a protrusion can for example provide an elliptical inner shape of the retaining ring.

15

According to a further embodiment the retaining ring is composable of at least two separate parts. This can simplify the manufacturing process as it is often easier to manufacture separate parts that are later connected with one another instead of a single element, especially since the retaining ring can comprise a variety of different elements such as the guiding means.

20

According to a second aspect of the invention a cartridge for storing a material to be dispensed is provided with the cartridge comprising at least one cartridge container configured to hold the material, a head part connectable to said cartridge container. Said head part comprises at least one outlet through which the material can be dispensed.

25

The outlet comprises a neck portion extending along a longitudinal axis of the cartridge with said neck portion comprising at least one protrusion configured to connect the cartridge to a mixer, in particular the mixer according to the invention, and/or to a retaining ring.

5

The protrusion can for example be configured to be connected to the retaining ring, in particular the guiding means of said retaining ring, of the mixer according to the invention.

10 Alternatively, it can also be possible that the protrusion is configured to be connected to a retaining ring. Said retaining ring can be a separate element which becomes a part of the cartridge upon connection of the two.

15 According to an embodiment of the invention the cartridge comprises a further cartridge container which is arranged next to the other cartridge container. Hence, the cartridge can comprise two cartridge container which are both configured to store a material therein. The materials can in particular differ from one another. Said materials can then be mixed with one another in the above mentioned mixer, in particular the mixer according to the invention.

20

According to a further embodiment the head part comprises two outlets with each outlet comprising the at least one protrusion. This can for example be advantageous or necessary when the cartridge comprises two cartridge containers such that each container comprises its own outlet. Alternatively, this can also be  
25 advantageous in case the cartridge comprises two compartments with said compartments storing different materials therein such that each compartment comprises its own outlet.

30 According to another embodiment the cartridge further comprises at least one connection element configured to cooperate with connection means, in particular

the connection means of the mixer according to the invention, such that the cartridge can be connected to another component, in particular to the mixer according to the invention.

- 5 In this connection it should be noted that the connection element can for example be one of a protrusion, a hook, a groove, a ramp and/or combinations of the foregoing.

Such connection elements can cooperate with or can a part of connection means  
10 such as bayonet connections, click connection, snap connections etc. It could also be possible that the connection element is part of a screw connection.

It can further be possible that the connection element is configured to connect the cartridge to said mixer by a rotation selected in the range of 10 to 90°. The precise  
15 angle can vary depending on the type of connection the connection element is involved into.

According to another embodiment of the invention the cartridge further comprises a connection plate arranged at the head part of the cartridge and configured to  
20 axially connect the cartridge to a further component, such as the mixer according to the invention. It may for example be possible that the connection plate is configured to be axially held by another component, e.g. a component of the mixer. That is, the connection plate may be arranged such that it can be held and/or gripped by another component to axially connect the cartridge to the further  
25 component.

In this connection it may also be possible that said connection plate surrounds the at least one outlet, in particular the neck portion, of the cartridge. Hence, in this case the connection plate is configured to connect the outlet of the cartridge to

another component such that the material that is dispensed through the outlet directly enters the further component, e.g. the mixer.

5 It is further also possible that said connection plate has an elliptical shape. Such a shape allows an easy way to correctly align the cartridge with respect to the further component.

10 According to a further embodiment of the invention the cartridge container is one of a rigid or a flexible cartridge container. Hence, the cartridge container can either be made out of a rigid material that is solid enough to provide stability.

Alternatively, the cartridge container can be made out of a flexible material, such as a film- or a foil-bag, which can be compressed in order to urge the material stored therein out of the outlet of the container.

15 According to another embodiment the cartridge further comprises a support sleeve configured to receive and protect the cartridge container. Such a support sleeve can be provided in either one of the above cases, i.e. for both a solid or a flexible cartridge container.

20 It is further possible that the cartridge further comprises a retaining ring configured to couple the cartridge to a mixer, in particular the mixer according to the invention, in particular with said retaining ring being mounted on the connection plate. Such a retaining ring can for example be pre-mounted on the cartridge, i.e. on the head part of the cartridge in order to connect the cartridge to a further  
25 component such as a mixer. Alternatively, it could also be possible that the retaining ring is provided as a separate element which is only connected to the cartridge upon connection of the cartridge to the mixer.

In this connection it should be noted that the retaining ring can comprise all of the above mentioned features, which have been described in connection with the retaining ring of the mixer according to the invention.

- 5 According to a third aspect of the invention a cartridge assembly configured to store, mix and dispense materials is provided with the assembly comprising a mixer according to the invention and a cartridge to the invention.

10 The invention is further described by the following embodiments which are shown in the Figures:

Fig. 1: a detailed perspective view of a cartridge assembly;

Fig. 2: a detailed perspective view of the connection of Fig. 1;

15

Fig. 3: a part view of the outlets of the cartridge;

Fig. 4: the connection of Fig. 2 shown with a transparent retaining ring;

20 Fig. 5: another embodiment of a mixer connected to a cartridge;

Fig. 6: a detailed view of the connection of Fig. 5 with a transparent retaining ring;

25 Fig. 7: detailed views of the retaining ring;

Fig. 8: a top view of the connection of Fig. 7 and a perspective view of the retaining ring;

30 Fig. 9: a cartridge assembly according to the invention.

Fig. 1 shows parts of the mixer 10 according to the invention which is already connected to a cartridge 100 according to the invention. Hence, Fig. 1 shows a detailed view of a cartridge assembly according to the invention.

5

The mixer 10 comprises two inlets 12 (see Fig. 6), through which material stored inside the cartridge 100 can enter the mixer 10, and a mixing element 16 which is arranged inside a mixer housing 14. In Fig. 1 the mixer housing 14 is shown as a transparent housing. However, this must not necessarily be the case.

10

The assembly further comprises a retaining ring 18 which is arranged at an inlet side 11 of the mixer 10. The retaining ring 18 can either be part of the mixer 10 or part of the cartridge 100 or it could also be separate element which is only connected with the mixer 10 and the cartridge 100 when the two are supposed to be connected to one another. The further details of the retaining ring 18 are described below, in particular in connection with Figs. 4 to 8.

15

Fig. 1 further shows that cartridge 100 comprises two cartridge containers 102 which are arranged next to one another. Cartridge 100 also includes a head part 104 that has two outlets 106, one for each container 102 (see Fig. 3 and 4).

20

The head part 104 comprises a neck portion 108 which is configured to connect the cartridge 100 to the mixer 10, in particular to the retaining ring 18 in case the retaining ring 18 is part of the mixer 10 and not pre-mounted on the cartridge 100 itself. This can be done by providing a protrusion 110 at each outlet 106 of the cartridge 100 (see Fig. 4) which is configured to cooperate with corresponding connection recesses or protrusions on the retaining ring 18 (not shown) or on the mixer (also not shown) such that cartridge 100 and the mixer 10 are at least axially fixed to one another.

25

30



For connection reasons the neck portion 108 can further comprise at least one connection element 112 which is configured to axially fix the cartridge 100 to the retaining ring 18 and/or the mixer (see the two connection elements 112 of Fig. 2). In the embodiment shown this is done by providing the connection element 112  
5 with a connection protrusion 113 which is configured to axially hold the retaining ring 18 by extending beyond a web 24 which surrounds the outer surface 30 of the retaining ring 18.

It can further be seen in Fig. 1 that the cartridge containers 102 and thus also the  
10 cartridge 100 itself as well as the retaining ring 18 comprise an elliptical shape. The retaining ring 18 shown in Fig. 1 does not only comprise an elliptical outer shape but also an elliptical inner shape. This allows a user to easily know how to align the mixer 10 with respect to the cartridge 100.

15 To further emphasize an elliptical inner shape of the retaining ring 18, said retaining ring can comprise a protrusion 28 which extends along its inner surface 32 to allow only correspondingly shaped elements to be inserted into the retaining ring (see e.g. Fig. 5 and Fig. 6). This can ensure that only predetermined mixers  
20 10 and cartridges 100 can be connected with one another. That is, the elliptical shape of the retaining ring 18 provides a coding scheme with which a user can easily determine which mixer 10 is supposed to be connected to a certain cartridge 100.

Said coding scheme can especially be seen in Fig. 6 where the retaining ring 18 is  
25 shown as a transparent element such that the inlets 12 of the mixer 10 can be seen. It can further be seen that the inlets 12 are arranged next to one another such that each inlet 12 can be connected with one outlet 106 of the cartridge 100. The two inlets 12 are further connected with one another by an elliptical plate 13 which surrounds the mixing element 16 that is connected to the two inlets 12. The  
30 elliptical plate 13 comprises a size that matches opening O which is limited by the

protrusion 28 of the retaining ring 18. This way, it can be ensured that plates 13 (and thus mixers) of other shapes and sizes cannot be inserted into said opening O.

- 5 As in the embodiment shown in Figs. 1 and 2 the cartridge 100 comprises two separate connection elements 112, it can be ensured that due to the elliptical shape of the retaining ring 18, the retaining ring 18 can be disconnected from the cartridge 100 by rotating it for about 90° such that the narrow side of the retaining ring 18 faces the space between the two connection elements 112. In this position  
10 the web 24 of the retaining ring 18 is not held by the connection protrusion 113 anymore such that the retaining ring 18 can be removed.

Nevertheless, it could also be possible that the dimensions of the cartridge 100 as well as the retaining ring 18 and the mixer 10 are chosen such that the head part  
15 104 comprises only one single connection element 112, for instance, which is configured to permanently fix the retaining ring 18 to the cartridge 100 in an axial direction such that it is pre-mounted on said cartridge 100.

An alternative or additional way of axially fixing the retaining ring 18 to the  
20 cartridge 100 is shown in Fig. 3 and/or Fig. 4 which shows that the cartridge 100 can further comprise a connection plate 114 which is arranged at the head part 104 and which surrounds the two outlets 106 of the cartridge 100. Said connection plate 114 can generally comprise the same function as web 24 of the retaining ring 18. That is, it can cooperate with corresponding retaining elements 26 which are  
25 configured to axially hold the connection plate 114 upon connection of the retaining ring 18 to the cartridge 100.

This can for example be seen in Fig. 4 where the retaining ring 18 is depicted as a transparent element for the sake of simplicity. It can be seen that the connection  
30 plate 114 is arranged at a distance to the cartridge containers 102 such that

corresponding retaining elements 26 which are arranged at an inner surface 32 of the retaining ring 18 can hold the connection plate 114 to axially fix the retaining ring 18 to the cartridge 100.

- 5 In this connection it should be noted that even though Fig. 4 shows an embodiment where the connection plate 114 and the corresponding retaining elements 26 are the only measure to axially fix the retaining ring 18 to the cartridge 100, it could also be possible that the cartridge 100 and the retaining ring 18 additionally comprise the connection element 112 and web 24, respectively,  
10 which have been described in connection with Figs. 1 and 2, as well as connection means 22 which are described in the following.

Fig. 2 also shows that the retaining ring 18 can further comprise connection means 22 which not only allow an axial connection of the retaining ring 18 to the cartridge  
15 100 but also a connection in a circumferential direction such that upon use of the cartridge assembly the retaining ring 18 cannot not accidentally rotate and thus disconnect from the cartridge 100, for example upon use of the cartridge assembly.

- 20 In the embodiment shown in Fig. 2 the connection means 22 are configured as two connection holes 34 which are arranged such that as soon as the retaining ring 18 is brought into a closed position, the connection protrusions 113 of the connection elements 112 of the cartridge 100 can slide into said holes 34, thereby ensuring that the retaining ring 18 cannot easily be rotated out of said closed position. Also,  
25 in order to loosen the connection between the retaining ring 18 and the cartridge 100, a user must apply a greater force to overcome the snap fit connection of the connection means 22.

It can further be seen in Fig. 4, for example, that the retaining ring 18 also  
30 comprises guiding means 20 at the inner surface 32 that extend essentially spirally

long said inner surface 32. The guiding means 20 are configured to guide the retaining ring 18 when the mixer 10 is connected to or detached from the cartridge 100.

- 5 The guiding means depicted in Fig. 4 are designed as ribs 20 that can slide along corresponding ribs (not shown) of the mixer 10 upon connection of the two. Said guiding means 20 in the form of ribs can also be seen on the right-hand side of Fig. 8 where a perspective view of the retaining ring 18 is shown.
- 10 These ribs 20 act in a similar way to an inner thread and enable an entraining of the mixer 10 to introduce, i.e. move, the inlets 12 of the mixer 10 into the outlets 106 of the cartridge 100.

The guiding means 20 allow an easier connection and removal of the mixer to  
15 respectively from the cartridge 100 as they are configured to reduce the force needed to move the retaining ring with respect to the cartridge 100 and/or the mixer 10.

In connection with the retaining ring 18 it should further be noted that said  
20 retaining ring 18 can either be manufactured as a single component or as two or more components that are later connected with one another to form the retaining ring 18.

Furthermore, as it can be seen in Figs. 4 and 5, for example, the retaining ring 18  
25 can comprise cutouts C which may be artefacts of its manufacturing process, i.e. they may be needed in for injection molding the retaining ring 18 in one piece.

Finally, Fig. 9 shows a real-life embodiment of the cartridge assembly according to the invention. The cartridge assembly is depicted in the form of a syringe 200.  
30 Cartridge 100 comprises a support sleeve 202 housing two cartridge containers

102, which can therefore not be seen in Fig. 9. Syringe 200 further comprises a dispensing mechanism 204 in the form of two piston rods 206 that are configured to urge a piston (not shown) which is arranged at a rear end of each container 102 towards the outlets 106 of the containers 102, thereby also urging the materials  
5 stored inside the containers 102 out of said outlets 106.

The retaining ring 18 is pre-mounted on the support sleeve 202 (and thus on the cartridge 100) and rotatable with respect to the cartridge 100.

10 It can be seen in Fig. 9 that as long as the syringe 200 is in a storage mode, it can comprise a cap 208 which is configured to seal the two outlets 106 of the cartridge 100 such that no material can leak outside the cartridge 100.

15 Once the syringe is supposed to be used, the retaining ring 18 is rotated for 90° to reveal the two outlets 106 by aligning the elliptical inner shape of the retaining ring 18 with said two outlets 106. In this position of the retaining ring 18, cap 208 can be removed such that instead a mixer 10 can be connected to the cartridge 100 by inserting the inlets 12 of the mixer 10 into the outlets 106 of the cartridge 100.

20 In order to axially fix the mixer 10 to the cartridge 100 the retaining ring 18 is rotated back into its previous position such that the elliptical inner shape of the retaining ring 18 does not align with the elliptical plate 13 of the mixer anymore.

25 Hence, it can be seen that by providing a retaining ring 18 that comprises an elliptical shape not only an axial connection between the cartridge 100 and the mixer 10 can be ensured, but also a coding scheme as only mixers 10 with correspondingly shaped plates 13 can be inserted through the opening O which is limited by the elliptical inner shape of the retaining ring 18.

30

**Reference signs**

	mixer	10
	inlet side	11
5	inlet	12
	elliptical plate	13
	mixer housing	14
	mixing element	16
	retaining ring	18
10	guiding means	20
	connection means	22
	web	24
	retaining element	26
	protrusion	28
15	outer surface	30
	inner surface	32
	connection hole	34
	cartridge	100
	container	102
20	head part	104
	outlet	106
	neck portion	108
	protrusion	110
	connection element	112
25	connection protrusion	113
	connection plate	114
	syringe	200
	support sleeve	202
	dispensing mechanism	204
30	piston rod	206
	cap	208
	opening	O
	cutout	C

### Claims

1. Mixer for mixing two components with one another comprising at least one  
5 inlet (12) for receiving the two components and at least one outlet arranged  
at an opposite end of the mixer (10) for dispensing the mixed components,  
a mixer housing (14) extending along a longitudinal axis between said inlet  
(12) and said outlet and a mixing element (16) with the mixing element (16)  
being arranged inside the mixer housing (14),  
10 wherein the mixer housing (14) further comprises a retaining ring (18)  
arranged at the at least one inlet (12) of the mixer (10), the retaining ring  
(18) being configured to be connected to a cartridge (100), with said  
retaining ring (18) comprising guiding means (20) at an inner surface (32)  
thereof with said guiding means (20) extending essentially spirally along  
15 said inner surface (32) of the retaining ring (18), and  
wherein said guiding means (20) are further configured to guide the  
retaining ring (18) when the mixer (10) is connected to or detached from  
said cartridge (100), and  
20 wherein said retaining ring (18) comprises an elliptical outer and/or inner  
shape.
2. The mixer according to claim 1,  
wherein said retaining ring (18) is fixedly connected to the mixing element  
(16) and/or the mixer housing (14).  
25
3. The mixer according to claim 1,  
wherein the retaining ring (18) is releasably couplable to the mixer (10).
4. The mixer according to one of the preceding claims,

wherein the retaining ring (18) is further rotatable with respect to the mixing element (16).

5. The mixer according to one of the preceding claims,  
5 wherein the retaining ring (18) further comprises connection means (22) configured to connect the mixer (10) to said cartridge (100).
6. The mixer according to claim 5,  
10 wherein the connection means (22) are at least one of a bayonet connection, a threaded connection, a snap fit connection and/or combinations of the foregoing.
7. The mixer according to claim 5 or 6,  
15 wherein the connection means (22) are configured to connect the mixer (10) to said cartridge (100) by a rotation of the retaining ring (18) selected in the range of 10 to 90°.
8. The mixer according to one of the preceding claims,  
20 wherein the retaining ring (18) comprises a web (24) extending circumferentially along an outer surface (30) of the retaining ring (18) and with said web (24) being configured to fix the retaining ring (18) axially with respect to said cartridge (100) upon connection of the two.
9. The mixer according to one of the preceding claims,  
25 wherein the retaining ring (18) further comprises at least one retaining element (26) at the inner surface (32) thereof configured to fix the retaining ring (18) axially with respect to said cartridge (100) upon connection of the two.
- 30 10. The mixer according to one of the preceding claims,



wherein the retaining ring (18) comprises a circumferential protrusion (28) at an end remote from the inlet (12) of the mixer (10) that surrounds the mixing element (16).

- 5 11. The mixer according to one of the preceding claims,  
wherein the retaining ring (18) is composable of at least two separate parts.
12. Cartridge (100) for storing a material to be dispensed comprising at least  
one cartridge container (102) configured to hold the material, a head part  
10 (104) connectable to said cartridge container (102) with said head part  
(104) comprising at least one outlet (106) through which the material can be  
dispensed,  
wherein the outlet (106) comprises a neck portion (108) extending along a  
longitudinal axis of the cartridge (100) with said neck portion (108)  
15 comprising at least one protrusion (110) configured to connect the cartridge  
(100) to a mixer (10), in particular the mixer according to claims 1 to 11.
13. The cartridge according to claim 12,  
comprising a further cartridge container (102) being arranged next to the  
20 other cartridge container (102).
14. The cartridge according to claim 12 or 13,  
wherein the head part (104) comprises two outlets (106) with each outlet  
(106) comprising the at least one protrusion (108).  
25
15. The cartridge according to one of claims 12 to 14,  
further comprising at least one connection element (112) configured to  
cooperate with connection means, in particular the connection means (22)  
according to claim 5 or 6, such that the cartridge (100) can be connected to

another component, in particular to the mixer (10) according to one of claims 1 to 11.

16. The cartridge according to claim 15,  
5 wherein the connection element (112) is one of a protrusion, a hook, a groove, a ramp and/or combinations of the foregoing.
17. The cartridge according to claim 15 or 16,  
10 wherein the connection element (112) is configured to connect the cartridge (100) to said mixer (10) by a rotation selected in the range of 10 to 90°.
18. The cartridge according to one of claims 12 to 17,  
15 further comprising a connection plate (114) arranged at the head part (104) of the cartridge (100) and configured to axially connect the cartridge (100) to a further component, such as the mixer (10) according to one of claims 1 to 11.
19. The cartridge according to claim 18,  
20 with said connection plate (114) surrounding the at least one outlet (106), in particular the neck portion (108), of the cartridge (100).
20. The cartridge according to claim 18 or 19,  
with said connection plate (114) having an elliptical shape.
- 25 21. The cartridge according to one of claims 12 to 20,  
wherein the cartridge container (102) is one of a rigid or a flexible cartridge container (102).
22. The cartridge according to one of claims 12 to 21,

wherein the cartridge (100) further comprises a support sleeve (202) configured to receive and protect the cartridge container (102).

23. The cartridge according to one of claims 12 to 22,  
5 wherein the cartridge (100) further comprises a retaining ring (18) configured to couple the cartridge (100) to a mixer, in particular the mixer (10) of one of claims 1 to 11, in particular with said retaining ring (18) being mounted on the connection plate (114).
- 10 24. Cartridge assembly configured to store, mix and dispense materials comprising a mixer (10) according to one of claim 1 to 11 and a cartridge (100) according one of claims 12 to 23.



**Application No:** GB2218637.3

**Examiner:** Vivek Vijayaraghavan

**Claims searched:** 1 to 11, and in part 24

**Date of search:** 7 June 2023

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 2, 4-7, 9-11, and in part 24	WO 2007/003063 A1 (MIXPAC SYSTEMS AG) See figure 10
X	1, 2, 4-7, 9-11, and in part 24	medmix, 28 April 2022, "medmix upgrades its F-System with the 100% recycled greenLine bayonet ring", medmix.swiss, [online], Available from: <a href="https://www.medmix.swiss/News/2022-04-28-medmix-upgrades-its-F-System-with-greenLine-bayonet-ring">https://www.medmix.swiss/News/2022-04-28-medmix-upgrades-its-F-System-with-greenLine-bayonet-ring</a> [Accessed 7 June 2023] See the figures
X	1, 2, 4-7, 9-11, and in part 24	US 2007/0090079 A1 (KELLER) See figures 7 & 8
X	1, 3, 4-7, 9-11, and in part 24	US 2007/0175921 A1 (KELLER) See figures 24-30
X	1, 2, 4-7, 9-11, and in part 24	US 2017/0182511 A1 (HIEMER et al.) See figure 4

**Categories:**

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

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Worldwide search of patent documents classified in the following areas of the IPC

B05C
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The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, Patent Fulltext, INTERNET
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**International Classification:**

<b>Subclass</b>	<b>Subgroup</b>	<b>Valid From</b>
B05C	0017/005	01/01/2006