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(54) **METHOD FOR TAPPING BEVERAGES WITH A FOAM HEAD USING A NON-GASEOUS FOAMING AGENT, PROPELLANT-LESS PRESSURIZATION, AND A JET-SHOOTER ATTACHMENT**

(57) The present invention relates to a method for tapping beverages with a foam head, comprising the steps:

- preparing a pre-mixture of liquid ingredients for the beverage and filling a container (4) with it, the container being coupled to an operable dispensing tap head (18) of a tapping installation having an outlet flow channel (20), wherein each time the tap head (18) is operated, an amount of the pre-mixture flows pressurized out of the outlet flow channel (20) into a glass (26) or the like while forming the foam head on the beverage inside the glass (26) or the like,

the step of preparing the pre-mixture of liquid ingredients for the beverage comprises mixing a non-gaseous foaming agent with the liquid ingredients, the external pressurization of a compressible part of the container (4) or a pump is used to have the pre-mixture flow pressurized out of the container (4) towards the tap head (18), and

a jet-shooter attachment (22) is provided at the outlet flow channel (20) of the tap head (18) that is configured for shooting out jets of the pre-mixture to allow the foaming agent therein to froth the foam head inside the glass (26) or the like while taking in ambient air, and an assembly for the same.

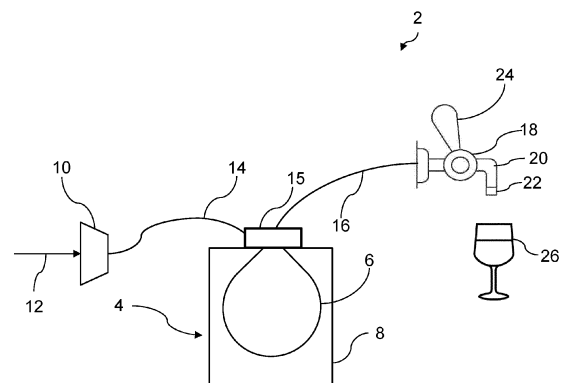


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a method for tapping beverages with a foam head, as well as to a tapping assembly, tapping installation, and a jet-shooter attachment for the same.

BACKGROUND OF THE INVENTION

[0002] Cocktails are becoming more and more popular under customers of bars and restaurants. These cocktails are generally prepared by a bartender who mixes the ingredients and shakes or stirs them together, after which the cocktail is served in a glass. However, due to the high demand of these beverages and a shortage of personnel available to prepare them, new ways are sought to improve the efficiency with which the beverages can be prepared while simultaneously beholding the quality of the served drink. It has therefore become more common to serve cocktails on tap. Draft cocktail systems can efficiently serve many cocktails in a short amount of time, which increases the product output while requiring less manual work.

[0003] However, not all cocktails can easily be served on tap. Some cocktails, like the well-known Pornstar Martini and Espresso Martini, are desired to have a characteristic dense/strong foaming head (foamed top layer) after serving which contributes to the customer experience. To obtain such a foaming head in cocktail draft systems, it is required to feed nitrogen into pre-mixed cocktail beverage before serving.

[0004] Firstly, the nitrogen may be used as propellant and to expel any oxygen out of a container that comprises the pre-mixed cocktail beverage by pressurizing the container under high pressure nitrogen.

[0005] A disadvantage hereof is that a high pressure of pure nitrogen (or nitrogen mixed with carbon dioxide) is required, which makes the tapping not only costly, but more importantly also may bring along serious health risks for personnel in case of propellant cylinders being stored in non-ventilated spaces.

[0006] Secondly, the nitrogen may get infused into the pre-mixed cocktail beverage after it is forced to flow out of such a container towards a tap. In that case a so called nitrogen infusion module can be integrated in a tapping line that connects the container to the tap. Such a nitrogen infusion module then is configured to inject high pressure nitrogen gas into a flow of the pre-mixed cocktail beverage and then force it through a series of fine mesh filters to infuse the nitrogen in the cocktail. Multiple of these fine mesh filters are required to obtain the right amount of nitrogen in the beverage. The nitrogen-infused cocktail beverage then is supplied under high pressure to the tap inside which a special restriction plate is provided. This restriction plate is formed by a small plate that comprises a number of small holes through which

the nitrogen-infused cocktail beverage is forced. Due to a combination of the high liquid pressure and the restriction plate against which the liquid bumps on the way out, the nitrogen in the cocktail beverage starts to nucleate and forms small nitrogen bubbles. When tapped into a glass, these nitrogen bubbles give the cocktail a foaming head.

[0007] A disadvantage of these commercial nitrogen infusion modules is that the fine mesh filters get easily clogged. This limits the use of the cocktail tap to only being able to tap pre-mixed cocktail beverages that are based upon pre-filtered juices for example. This is because the risk of clogging makes it practically impossible to start serving cocktails based upon so-called 'fresh' juices with lots of large fruit fibers inside it. The large fruit fibers in the fresh fruit juices enhance the customer experience but are detrimental for the filter mesh, clogging the filters already after only two or three servings. To properly clean the filters, the nitrogen infusion modules must be completely disassembled, which is a difficult and time consuming task.

[0008] Another disadvantage is the requirement of nitrogen cylinders when serving cocktails. Repurchasing or refilling the cylinders is expensive, but may also causes delay during serving of the drinks when the cylinder must be switched. This is particularly disadvantageous at for example large events, where you would like to be able to continuously serve cocktails without having to switch nitrogen cylinders when empty.

DESCRIPTION OF THE INVENTION

[0009] The present invention aims to overcome the above disadvantages at least partly or to provide a suitable alternative. In particular the invention aims to provide a solution for being able to tap beverages like cocktails in a propellant-less manner without running a risk of clogging and while obtaining a stable, strong and dense foam head.

[0010] In a first aspect, the present invention provides a tapping method for tapping beverages with a foam head according to claim 1. This method comprises the steps preparing a pre-mixture of liquid ingredients for the beverage and filling a container with it, providing a tapping installation that comprises an operable dispensing tap head having an outlet flow channel, coupling the container to the tap head, and each time the tap head is operated, have an amount of the pre-mixture flow pressurized out of the outlet flow channel into a glass or the like while forming the foam head on the beverage inside the glass or the like. According to the inventive thought the step of preparing the pre-mixture of liquid ingredients for the beverage comprises mixing a non-gaseous foaming agent with the liquid ingredients, wherein a pump or external pressurization of a compressible part of the container is used to have the pre-mixture flow pressurized, in particular propellant-less, out of the container towards the tap head, and wherein a jet-shooter attachment is provided

at the outlet flow channel of the tap head that is configured for shooting out jets of the pre-mixture to allow the foaming agent therein to froth the foam head inside the glass or the like while taking in ambient air.

[0011] In a second aspect, the present invention relates to a tapping assembly for tapping beverages with a foam head according to claim 7. The tapping assembly comprises a container filled with a prepared pre-mixture of liquid ingredients for the beverage, and a tapping installation with an operable dispensing tap head having an outlet flow channel, and a coupling element configured for coupling the container to the tap head, wherein the tapping installation is configured for, each time the tap head is operated, have an amount of the pre-mixture flow pressurized out of the outlet flow channel into a glass or the like while forming the foam head on the beverage inside the glass or the like. According to the inventive thought the container is filled with the pre-mixture of liquid ingredients with a non-gaseous foaming agent added thereto, wherein the tapping installation further comprises a pump or a pressurizer for external pressurization of a compressible part of the container configured for having the pre-mixture flow pressurized, in particular propellantless, out of the container towards the tap head, and a jet-shooter attachment at the outlet flow channel of the tap head that is configured for shooting out jets of the pre-mixture to allow the foaming agent therein to whip the foam head inside the glass or the like while taking in ambient air.

[0012] The tapping method and assembly according to the invention provide an easy and efficient way for tapping beverages with a foam head. The method comprises preparing a pre-mixture of liquid ingredients, of which one of the liquid ingredients for example even can be a fresh fruit juice with lots of large fruit fibers inside it, for the beverage and filling a container with it. Mixed with the liquid ingredients is a non-gaseous foaming agent, which preferably can be a protein, and more preferably a vegan protein. The pre-mixture of the beverage is generally in a non-foamed condition and generally does not have additional N_2 and/or CO_2 added to the mixture besides any gasses already dissolved therein under standard (atmospheric) conditions. The pre-mixture inside the container thus is in a non-nitrogenated and non-carbonated condition. The container is coupled to an operable dispensing tap head of a tapping installation. The tap head has an outlet flow channel at which a jet-shooter attachment is provided. Said jet-shooter attachment may be a removable attachment piece provided at the outer end of a spout, or it may be the spout itself in which jet-shooting flow passages are provided. To have the pre-mixture flow pressurized out of the container towards the tap head, a pump or external pressurization of a compressible part of the container is used. This advantageously eliminates the need for a propellant, such as N_2 , CO_2 or a mixture thereof, and thus the need for gas cylinders to supply the pre-mixture from the container to the tap head. Furthermore, it also eliminates the need for

pressurized air to directly come into contact with the pre-mixture while still inside the container or on its way to the tap head. This helps to prevent the pre-mixture from starting to oxidize and maintain its optimum taste quality.

[0013] Each time the tap head is operated, manually or in an automated manner by a computer, an amount of the pre-mixture flows pressurized out of the outlet flow channel into a glass or similar collecting item. When flowing out of the outlet flow channel, the pre-mixture passes the jet-shooter attachment which is configured for inducing such flow characteristics into the pre-mixture that the specially added non-gaseous foaming agent therein automatically starts frothing the foam head inside the glass or the like while taking in ambient air. The pre-mixture flowing out of the outlet flow channel is still in a substantially non-foamed condition and advantageously still does not need any additional N_2 and/or CO_2 added to the mixture for being able to form the foam head. Only when the pre-mixture has flown out of the outlet flow channel and arrives into the glass or the like the foaming head gets frothed therein owing to the flow characteristics that the jet-shooter attachment has induced into the flow. The thus formed foam head consists almost exclusively of intake ambient air which has been taken in after the pre-mixture has flown out of the outlet flow channel.

[0014] With the invention, it is possible to serve perfectly foamed drinks in quick succession, making the method for tapping foamed beverages thus especially suitable for big events or festivals, but also for small-scale catering establishments that do not have the space or budget for a separate bartender to prepare foamed drinks. The beverages have a stable foam head without requiring N_2 , CO_2 or air to be actively added to the beverage before flowing out of the outlet flow channel. As such, no gas cylinders are required during tapping of the beverage, which reduces both the costs and the number of manual operations, and which increases the safety for personnel. Thus advantageously, fewer staff are needed to serve the drinks. Moreover, as N_2 is not required to be infused in the beverage before flowing out of the flow channel, no special extra nitrogen infusion module is required which would normally have a risk of clogging or breaking down.

[0015] Thus, the invention for the first time makes it possible to start tapping beverages comprising fresh or concentrated fruit juices, such as orange juice, cranberry juice, pineapple juice or passion fruit juice, with fruit fibres still in it. This is particularly advantageous for mixing cocktails or mocktails (alcohol-free cocktails), like a Pornstar Martini. Alternatively, cold brew coffees having a foaming head may also very well be served with the method according to the invention. The cold brew coffee may either be a standalone beverage, or it may be an ingredient of another beverage, such as a coffee-comprising cocktail, like an Espresso Martini.

[0016] It has surprisingly been found by the inventors of the present invention that the foam head that is obtained by the combination of the adding of the non-gas-

eous foaming agent to the pre-mixture, the propellant-less pressurization, and the pressurized flow through the jet-shooter attachment which causes foam to be frothed only after having left the outlet flow channel, has a superb stability when compared to conventional methods, such as when using the nitrogen infusion module or by manually shaking of a cocktail. The jet-shooter attachment is configured to induce velocity and pressure in the jets that get shoot out of it, that required frothing conditions are automatically created for the formation of a truly stable, strong and dense foam head. The foam head formed according to the invention even has appeared to be able to last as long as more than one hour, without losing hardly any of its attractive strong and dense outer appearance. This even makes it possible to prepare large amounts of the foam headed beverages in advance and then start serving them out to large numbers of guests at a same time. This was not possible at the same quality according to the prior art. This is very important, as a foam head that is too large, too little or does not have the right texture is detrimental for the customer experience. Tapped foamed beverages now can all be easily made with an optimal foam head to liquid ratio. During tapping, it is preferred to, when enough pre-mixture has been collected within the glass or the like, have the jet-shooter attachment submerged within the beverage in the glass. It has surprisingly been found that this way of tapping, provides the densest foam which is most stable.

[0017] According to a preferred embodiment the pre-mixture can be forced to flow pressurized through a tube-shaped housing of the jet-shooter attachment that has an internal transverse wall that is provided with a number of jet-shooting flow passages therein and an outlet end delimited by a circumferential wall. The outlet end preferably has a length of at least 3 mm, and advantageously may help to prevent sputtering to occur while at a same time providing some free air space for fine vaporized mist particles of the pre-mixture to arise around the shot out jets when still inside the outlet end. Those fine vaporized mist particles of the pre-mixture around the jets then are deemed to be perfectly suitable to immediately start taking in ambient air when still inside the outlet end. This further helps the frothing to take place when arriving inside the glass or the like.

[0018] In addition thereto the jets may get shot out of the jet-shooting flow passages in such directions that they pass through a center of the outlet end without bumping against a circumferential wall that delimits the outlet end. Thus sputtering is further prevented and maximum of free space is guaranteed all around the jets for taking in ambient air into finely sprayed vaporized mist particles of the pre-mixture that may arise around the shot out jets when still inside the outlet end.

[0019] The outlet end may delimit a cylindrical space, making it cost-effective and relative simple to manufacture. If desired the outlet end may however also be formed with a space that widens out, for example dome-shaped, in order to provide more free space for the pre-

mixture to already start taking in ambient air immediately when it has left the jet-shooting flow passages and still finds itself inside the outlet end.

[0020] In an embodiment of the invention, the pre-mixture may flow pressurized, in particular propellant-less, out of the container towards the tap head such that the pre-mixture still has a pressure of at least 1 bar when reaching the tap head. This minimum pressure at the tap head helps to guarantee that fine enough foam bubbles are formed for the foam head such that the foam head may become truly dense, strong and stable. Depending on required tapping speeds and/or skills of personnel using the tapping assembly, the pre-mixture preferably may have a pressure of between 1.3-2.4 bar when reaching the tap head. When tapping beverages, this has appeared an optimum pressure range for the method according to the invention in order to obtain just right amounts, densities and stabilities for the foam head. The pressure of tapping may further depend upon serving temperature and type of beverage to be served and/or on the amount of non-gaseous foaming agent present in the product.

[0021] In an embodiment of the invention, the non-gaseous foaming agent can be added to the pre-mixture of liquid ingredients for the beverage in an amount ranging from 0.01 - 5 wt%, preferably 0.03-1 wt% and more preferably 0.05-0.2 wt%. When tapping beverages, this has appeared an optimum concentration range for the method according to the invention in order to obtain just right amounts, densities and stabilities for the foam head. Furthermore, at this concentration range the taste of the served beverage advantageously does not get negatively influenced for having an optimal customer experience. The amount of non-gaseous foaming agent present in the beverage can be dependent on the type of beverage to be served and the pressure at which the product is tapped.

[0022] In an embodiment of the invention, the specially added non-gaseous foaming agent can be a protein, for example one that is present in egg white. More preferably the specially added non-gaseous foaming agent can be a vegan protein, for example one that is present inside boiling water from cooking legumes, like beans.

[0023] Preferably aquafaba can be added to the pre-mixture. Not only it is a vegan composition, it also comprises approximately 1% foaming proteins. When using unconcentrated aquafaba for mixing a right amount of vegan protein as non-gaseous foaming agent, it is preferred to add the aquafaba in an amount ranging from 0.5 - 25%, preferably ranging from 5 - 20 vol% to the beverage. Alternatively, foaming protein concentrates or isolated foaming proteins, for example from out of legumes, can be used as well.

[0024] Additionally or alternatively, non-gaseous and non-protein foaming agents may be included in the beverage, such as water soluble surfactants or emulsifiers, e.g. Methocel F50 or Polysorbate 80.

[0025] In an embodiment of the invention, the com-

pressible part of the container can be arranged within a rigid part, and a medium like compressed ambient air can then be provided between an outer side of the compressible part and an inner side of the rigid part for externally pressurizing the compressible part. Thus, no propellant is needed for pressurizing the pre-mixture. This not only reduces costs and improves ease of operation, but as importantly has appeared able to lead to a stronger and more stable foam head even when the pre-mixture contains 'fresh' juice with fruit fibres as one of its main ingredients. When using compressed ambient air, this can simply be provided by an air compressor, which can be automated to start operating when the tap head is operated.

[0026] In an embodiment of the invention, the jet-shooter attachment may shoot a limited number of jets of the pre-mixture which froth the beverage when the jets arrive into the glass or the like. The increased velocities and pressures, of the limited number of pre-mixture jets compared to the lower velocity and pressure of the pre-mixture upstream of the tap head, presumably in combination with turbulences that are induced in the pre-mixture inside the glass or the like, provide optimal frothing conditions to be automatically created within the beverage in the glass or the like, thereby forming the flow characteristics required to froth the beverage in the foreseen improved manner.

[0027] The jet-shooter attachment preferably may comprise between two and five jet-shooting flow passages. The amount of jet-shooting flow passages may depend on the beverage to be served. For example, for dispensing a beverage based on passion fruit juice or concentrate, preferably three jet-shooting flow passages are provided in the jet-shooter attachment.

[0028] In an embodiment of the invention, the jet-shooter attachment preferably can be releasably connected to the tap head, in particular by means of a threaded connection. Preferably, a spout then is used for the tap head that comprises outer threaded parts on both its free outer ends, one outer threaded end for connecting the spout in a conventional manner to the tap head and the other outer threaded end for releasably connecting an inner threaded part of the frothing thereto. Having the jet-shooter attachment releasably connected at the free end of the tap head makes it possible to quickly and efficiently clean it as many times as needed and whenever desired. For that the jet-shooter attachment can simply be manually unscrewed from the tap head or its spout, and then flushed clean underneath a water tap or the like. This is especially advantageous when using fresh juices with fruit fibres contained therein, such that any too large particles remaining behind and accumulating over time inside the jet-shooter attachment may be rinsed out again after detachment. The jet-shooter attachment can be made of a variety of materials, like plastic or metal, such as a synthetic polymer or stainless steel.

[0029] In an embodiment of the invention, the jet-shooting flow passages may have a diameter in the range

of 0.1 - 2 mm, preferably in the range of 0.5 - 1 mm. For dispensing a beverage with relative large fruit fibres, for example based on passion fruit juice or concentrate, a jet-shooting flow passage diameter of 0.8 mm is preferred. The through holes in the jet-shooter attachment may be provided parallel to a longitudinal direction of the jet-shooter attachment, or they may be provided at an angle relative the longitudinal direction of the jet-shooter attachment. It is preferred to have the jet-shooting flow passages positioned at a distance of at least 3 mm from an outlet side of the jet-shooter attachment. This has the advantage of preventing splash to occur during tapping, without running a risk of stabilizing/slowing down the streams too much again.

[0030] Further preferred embodiments are stated in the subclaims.

[0031] The invention also relates to a tapping installation according to claim 14, and to a jet-shooter attachment according to claim 15.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032]

Fig. 1 depicts an embodiment of a tapping assembly according to the invention;

Fig. 2 depicts an embodiment of a jet-shooter attachment according to the invention;

Fig. 3 depicts a bottom view of the jet-shooter attachment of Fig. 2;

Fig. 4 depicts a cross-sectional view of the jet-shooter attachment of Fig. 2 and 3 according to the invention;

Fig. 5 depicts a cross-sectional view of an alternative embodiment of the jet-shooter attachment according to the invention;

Fig. 6 depicts a spout which is releasably connectable to a tap head and a jet-shooter attachment according to the invention;

Fig. 7 depicts an embodiment of the spout of Fig. 6 which is connected to a jet-shooter attachment according to the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0033] Fig. 1 shows a tapping assembly according to an embodiment of the invention which is in its entirety denoted by reference number 2. The assembly comprises a container 4 which contains a pre-mixture of liquid ingredients for a beverage to which a non-gaseous foaming agent has been added. The pre-mixture is for example a pre-mixture for cocktails of which one of the added ingredients is aquafaba. The container 4 comprises a compressible part 6, containing the beverage, which is arranged within a rigid part 8. Connected to the container is an air compressor 10 configured for compressing ambient air 12 and supplying compressed air 14 to the container 4 via a coupling part 15 at a position between an

inner side of its rigid part 8 and an outer side of its compressible part 6. When the compressed air 14 enters the container 4, the compressible part 6 gets compressed such that the pre-mixture is able to flow pressurized via the same or a distinctive coupling part 15 from the container 4 via a flexible tube 16 to a tap head 18. No propellant, such as CO₂, N₂ or a mixture thereof, is thus required to have the pre-mixture flow out of the container 4. The tap head 18 has an outlet flow channel 20 and a jet-shooter attachment 22 at the outlet flow channel 20. The tap head 18 furthermore has a manually operable handle 24 with which the flow of liquid through the outlet flow channel 20 is controlled. The pre-mixture leaving the outlet flow channel 20 can be collected in a glass 26.

[0034] When the tap head 18 is operated, i.e. when pulling or pushing the handle 24, the pre-mixture, which is in a non-foamed condition, starts flowing through the outlet flow channel 20 into the glass 26, thereby passing the jet-shooter attachment 22. The jet-shooter attachment 22 is configured for shooting out jets with such flow characteristics in the pre-mixture that the pre-mixture gets frothed and the foaming agent therein is allowed to form a foam head on the beverage inside the glass 26. The foam head that is thereby formed consists almost exclusively of intake ambient air which is taken in when the pre-mixture jets out of the outlet flow channel 20 forcedly into the glass 26. No infused N₂ and/or CO₂ is thus required to obtain a foam head on the beverage. For the foam head to have optimal stability and texture, it is preferred to submerge the jet-shooter attachment 22 into the pre-mixture as soon as a sufficient layer thereof has been collected in the glass 26 during tapping.

[0035] Fig. 2 shows an embodiment of the jet-shooter attachment 22 which is configured to be releasably connectable to the tap head 18. The jet-shooter attachment 22 comprises a tube-shaped housing 28 with an outer side in which recesses 30 are provided. These recesses 30 improve grip during connecting and disconnecting of the jet-shooter attachment 22 to the tap head 18, but are not of influence on the foaming/frothing of the beverage (and therefore not required). The outer side of the jet-shooter attachment is arced in this embodiment, but can have any other shape as well. The opposite ends of the jet-shooter attachment 22 each comprise an opening, only the outlet opening 32 at the outlet end is shown, through which the pre-mixture flows during operation.

[0036] Fig. 3 shows the jet-shooter attachment 22 of Fig. 2 from a bottom side. The housing of the jet-shooter attachment 22 surrounds a flow path that extends in a longitudinal direction and that somewhere in the middle is blocked by a transverse wall 34 that defines a number of jet-shooting flow passages 36, in this embodiment three jet-shooting flow passages 36, which are configured for dividing the pre-mixture into a number of jets that get shot out of the jet-shooter attachment 22. These jets are still in a non-foamed condition when shot out of the jet-shooter attachment 22. When the plurality of pre-mixture jets are collected in the glass 26, the jets have been

given such velocity and/or pressure that they shall cause the beverage to be frothed inside the glass 26. Due to this, the non-gaseous foaming agent starts to form a foam head on the beverage.

[0037] Fig. 4 shows a cross-sectional view of the jet-shooter attachment 22 of Fig. 2 and 3. The jet-shooter attachment 22 has an inlet end 38 with which the jet-shooter attachment 22 is releasably connected to the tap head 18. The inlet end 38 is delimited by a circumferential wall comprising a threaded part (not shown) which is configured for engaging a threaded part of the tap head 18. Pre-mixture flowing from the tap head 18 into the jet-shooter attachment 22 is blocked by the traverse wall 34 such that it may only flow through the jet-shooting flow passages 30. An o-ring 35 may be provided after the threaded part of the inlet end 38 to prevent the pressurized pre-mixture from leaking out between the tap head 18 and the jet-shooter attachment 22. The pre-mixture shoots jetted out of the jet-shooter attachment 22 into a glass through an outlet end 32 that is delimited by a circumferential wall that has a length of at least 3 mm. This outlet end 32 helps to prevent sputtering to occur and at a same time already provides some space for ambient air to be taken into finely sprayed vaporized mist parts of the pre-mixture that may start to occur around the shot out jets inside the outlet end 32.

[0038] Fig. 5 shows an alternative embodiment of the jet-shooter attachment 22 wherein the outlet end 32 is dome-shaped to provide more free space for the pre-mixture to already start taking in ambient air immediately when it has left the jet-shooting flow passages 30 and still finds itself inside the outlet end 32.

[0039] Fig. 6 shows a spout 42 which is releasably connectable to both the tap head 18 and the jet-shooter attachment 22. Both sides of the spout 42 are provided with a threaded part 44, 46. Dependent on the threaded part of the tap head 18 and jet-shooter attachment 22, the threaded parts 44, 46 may be equal to one another and each threaded part 44, 46 of the spout can therefore be connected to both the tap head 18 and jet-shooter attachment 22. Moreover, at least one threaded part 44 of the spout is formed such that the spout is connectable to most conventional beverage tap heads. Thus advantageously, already existing tapping installations can easily be modified to also tap beverages with a foam head by only exchanging a conventional spout for a spout 42 to which a jet-shooter attachment 22 according to the present invention is connectable.

[0040] Fig. 7 shows the jet-shooter attachment 22 connected to the spout 42 of Fig. 6, which spout is releasably connectable to a tap head 18.

[0041] Besides tapping beverages with a foam head, the method and the tapping assembly according to the present invention may also be used for the preparation of other (preferably liquid) food products, such as dairy products, e.g. whipped cream or chocolate mousse. Depending on the amount of foaming protein already present in these food products, it might then not even be

required to add an additional non-gaseous foaming agent before dispensing of the product.

[0042] It should be understood that various changes and modifications to the presently preferred embodiments can be made without departing from the scope of the invention, and therefore will be apparent to those skilled in the art. It is therefore intended that such changes and modifications be covered by the appended claims.

Claims

1. Method for tapping beverages with a foam head, in particular beverages selected from coffee and cocktail, comprising the steps:

- preparing a pre-mixture of liquid ingredients for the beverage, preferably a non-carbonated and non-nitrogenated pre-mixture, and filling a container (4) with it;
- providing a tapping installation that comprises an operable dispensing tap head (18) having an outlet flow channel (20);
- coupling the container to the tap head (18); and
- each time the tap head (18) is operated, have an amount of the pre-mixture flow pressurized out of the outlet flow channel (20) into a glass (26) or the like while forming the foam head on the beverage inside the glass (26) or the like,

characterized in that

the step of preparing the pre-mixture of liquid ingredients for the beverage comprises mixing a non-gaseous foaming agent with the liquid ingredients,

wherein external pressurization of a compressible part (6) of the container (4) or a pump is used to have the pre-mixture flow pressurized, in particular propellant-less, out of the container (4) towards the tap head (18), and wherein a jet-shooter attachment (22) is provided at the outlet flow channel (20) of the tap head (18) that is configured for shooting out jets of the pre-mixture to allow the foaming agent therein to froth the foam head inside the glass (26) or the like while taking in ambient air.

2. Method according to claim 1, wherein the method is free of actively adding N₂, CO₂ or air to the pre-mixture before the pre-mixture flows out of the outlet flow channel.
3. Method according to claim 1 or 2, wherein the pre-mixture is pressurized in the absence of a propellant.
4. Method according to any of the preceding claims, wherein the pre-mixture is forced to flow pressurized through a tube-shaped housing of the jet-shooter at-

tachment (22) that has an internal transverse wall (34) that is provided with a number of jet-shooting flow passages (36) therein and an outlet end (32) delimited by a circumferential wall, and wherein the jets get shot out of the jet-shooting flow passages (36) through a center of the outlet end (32) without bumping against an inner wall of the outlet end (32).

5. Method according to one of the preceding claims, wherein the pre-mixture flow is pressurized, in particular propellant-less, out of the container (4) towards the tap head (18) such that the pre-mixture has a pressure in the range of at least 1 bar, preferably in the range of 1.3-2.4 bar when reaching the tap head (18).

6. Method according to one of the preceding claims, wherein the amount of non-gaseous foaming agent that is mixed with the liquid ingredients is in the range 0.01 - 5 wt%, preferably 0.03 - 1 wt%, and more preferably 0.05 - 0.2 wt%.

7. Method according to one of the preceding claims, wherein a protein is mixed as the non-gaseous foaming agent with the liquid ingredients, preferably a vegan protein.

8. Method according to one of the preceding claims, wherein the jet-shooter attachment (22) divides the pre-mixture into a plurality of pre-mixture jets which froth the beverage when the plurality of pre-mixture jets shoot out of the jet-shooter attachment (22) into the glass (26) or the like.

9. Tapping assembly for tapping beverages with a foam head, in particular beverages selected from coffee and cocktail, comprising:

- a container (4) filled with a prepared pre-mixture of liquid ingredients, preferably a non-carbonated and non-nitrogenated pre-mixture, for the beverage; and
- a tapping installation with:

- an operable dispensing tap head (18) having an outlet flow channel (20); and
- a coupling element (15) configured for coupling the container (4) to the tap head ,

wherein the tapping installation is configured for, each time the tap head (18) is operated, have an amount of the pre-mixture flow pressurized out of the outlet flow channel (20) into a glass (26) or the like while forming the foam head on the beverage inside the glass (26) or the like,

characterized in that

the container (4) is filled with the pre-mixture of liquid

ingredients with a non-gaseous foaming agent added thereto, wherein the tapping installation further comprises:

- a pressurizer for external pressurization of a compressible part (6) of the container (4) or a pump configured for having the pre-mixture flow pressurized, in particular propellant-less, out of the container (4) towards the tap head (18); and
 - a jet-shooter attachment (22) at the outlet flow channel (20) of the tap head (18) that is configured for shooting out jets of the pre-mixture to allow the foaming agent therein to froth the foam head inside the glass (26) or the like while taking in ambient air.
10. Tapping assembly according to claim 9, wherein the prepared pre-mixture is free of actively added N₂, CO₂ or air.
11. Tapping assembly according to claim 9 or 10, wherein the compressible part (6) of the container (4) is arranged within a rigid part, and wherein the pressurizer is an air compressor (10) configured for providing compressed ambient air between an outer side of the compressible part (6) and an inner side of the rigid part (8) for externally pressurizing the compressible part (6).
12. Tapping assembly according to claim one of the preceding claims 9-11, wherein the jet-shooter attachment (22) is releasably connected to the tap head (18), in particular by means of a threaded connection.
13. Tapping assembly according to one of the preceding claims 9-12, wherein the jet-shooter attachment (22) comprises a plurality of jet-shooting flow passages (36) configured for dividing the pre-mixture into a plurality of pre-mixture jets shot out of the jet-shooter attachment (22) into the glass (26) or the like, and wherein the jet-shooter attachment (22) preferably comprises between two to five, and preferably three jet-shooting flow passages (36) and/or wherein the jet-shooting flow passages (36) have a diameter in the range of 0.1-2 mm, preferably in the range of 0.5-1 mm.
14. Tapping installation configured for the tapping assembly according to one of the preceding claims 9-13.
15. Jet-shooter attachment (22) configured for the tapping installation according to claim 14.

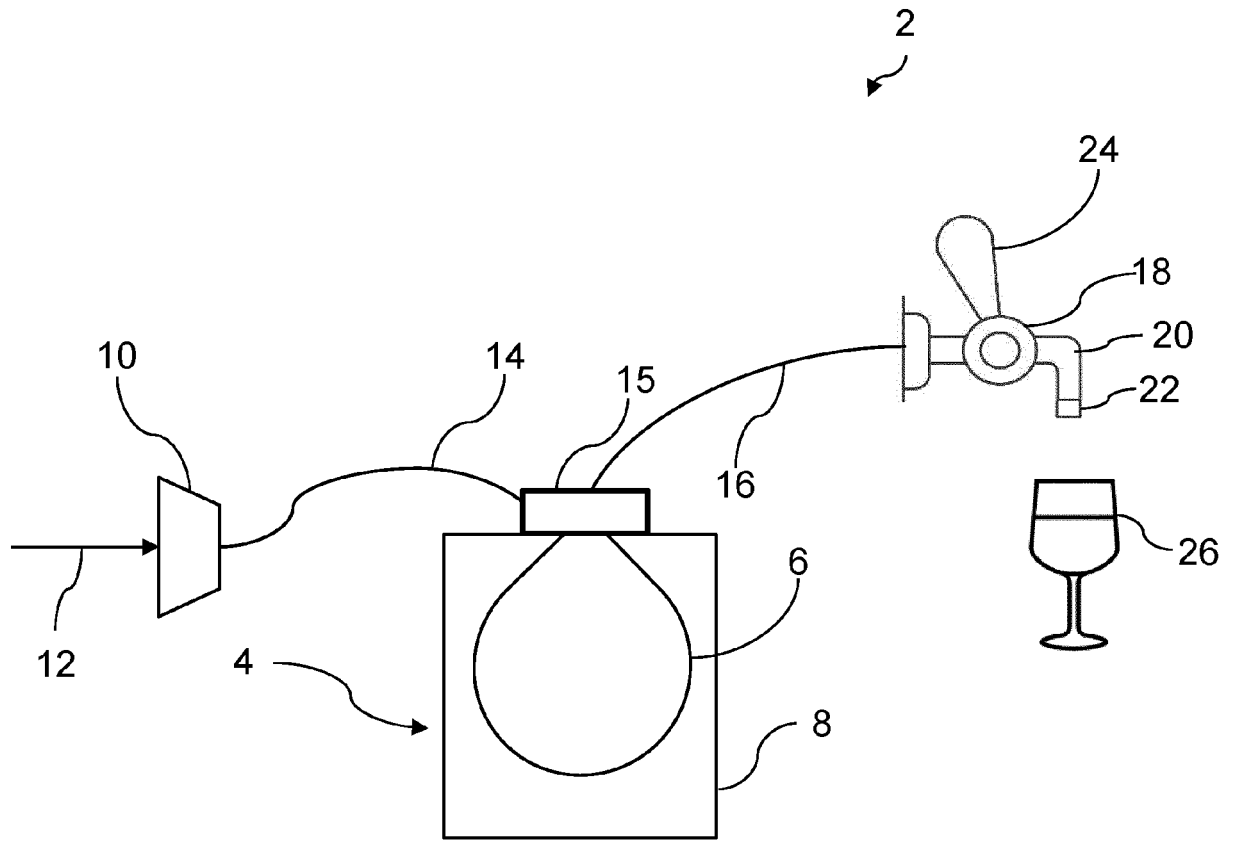


Fig. 1

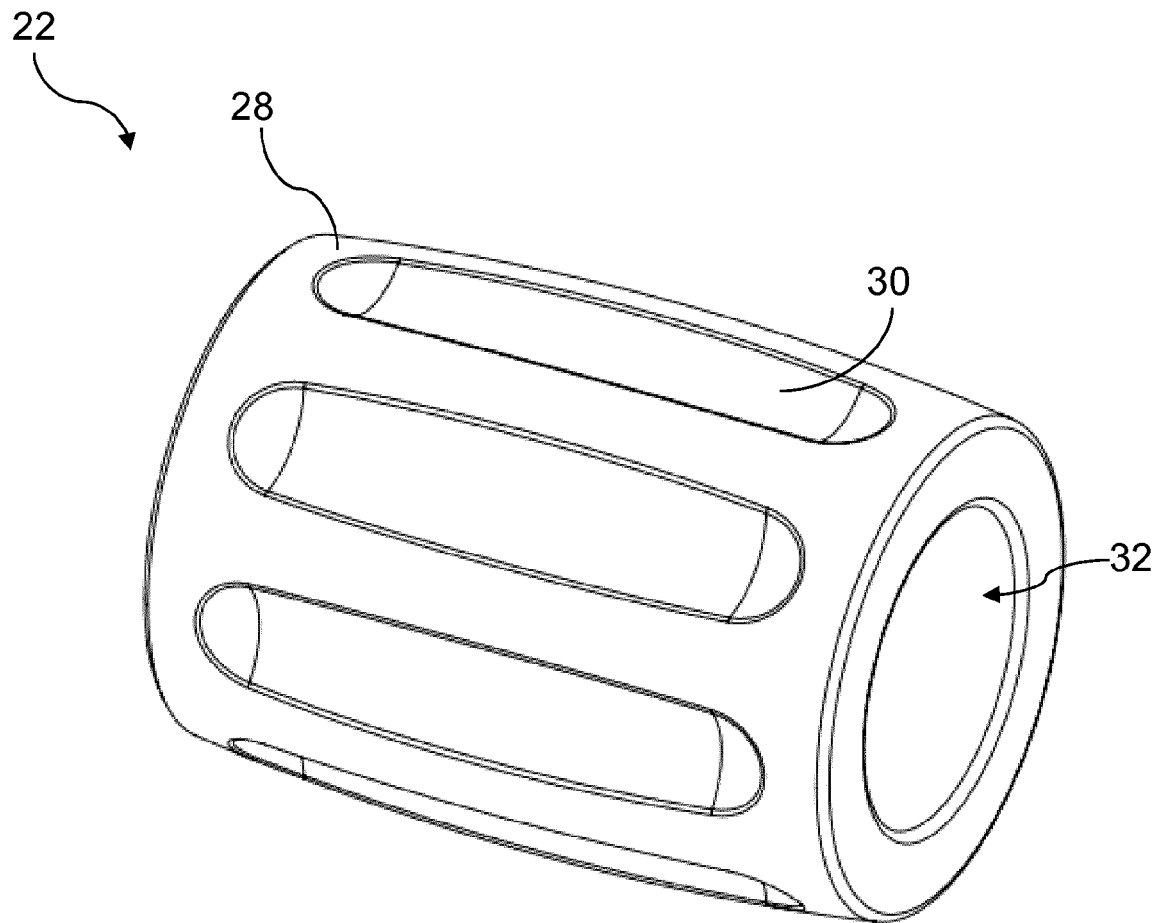


Fig. 2

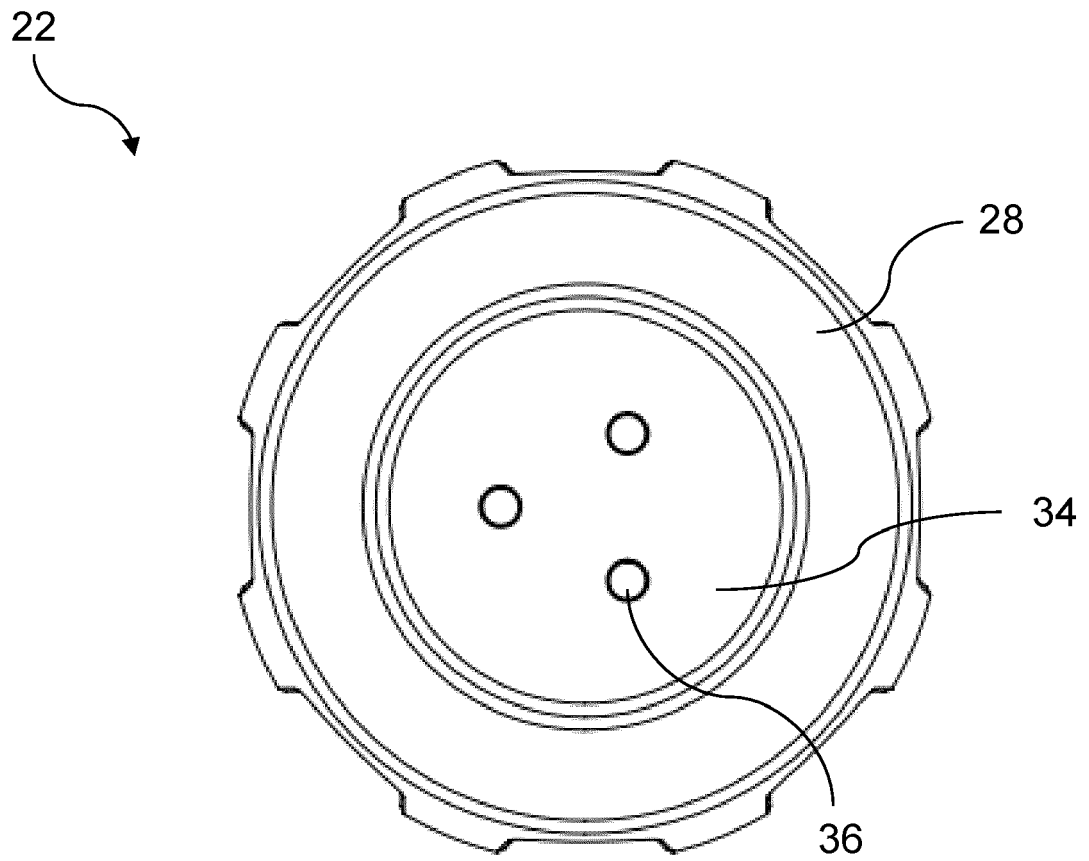


Fig. 3

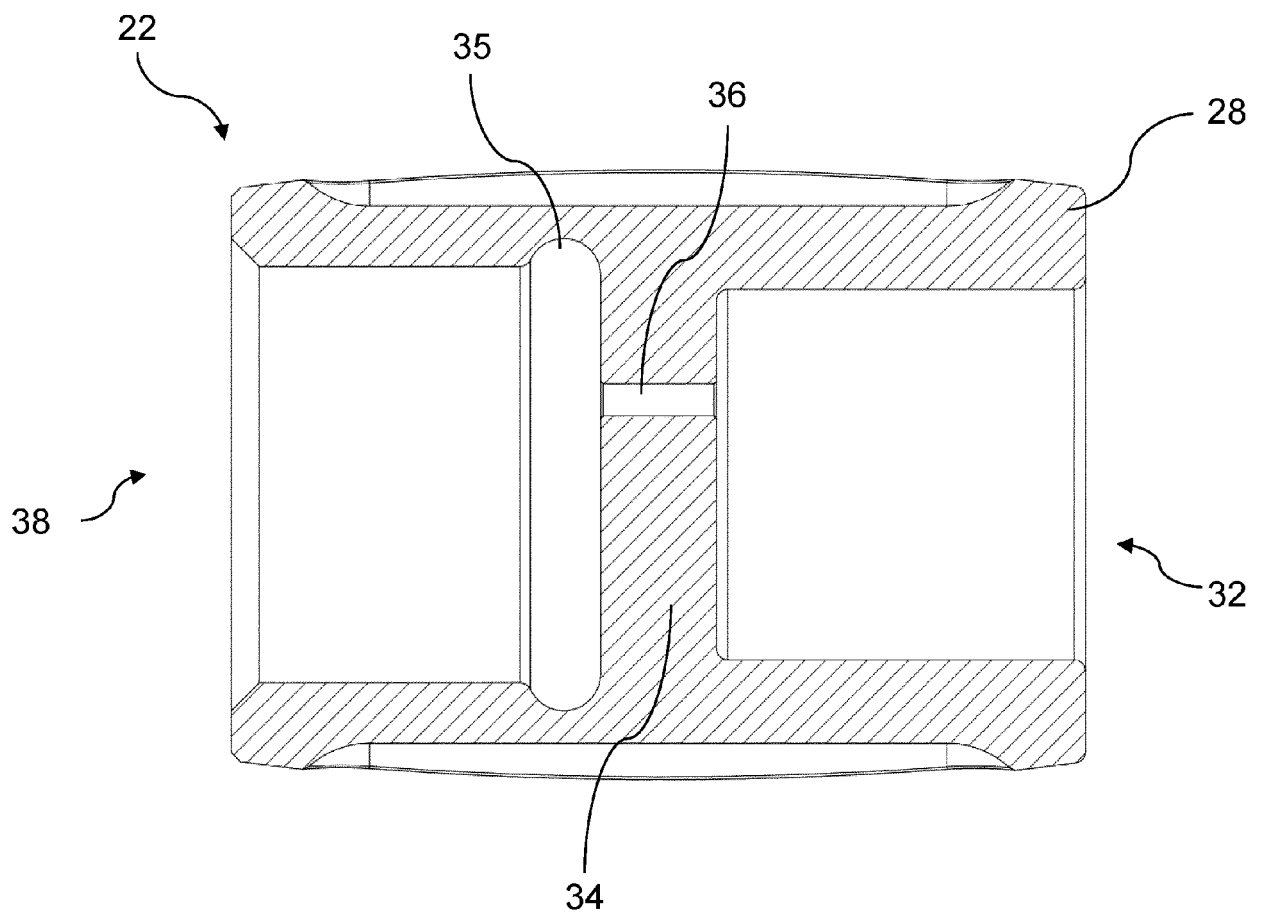


Fig. 4

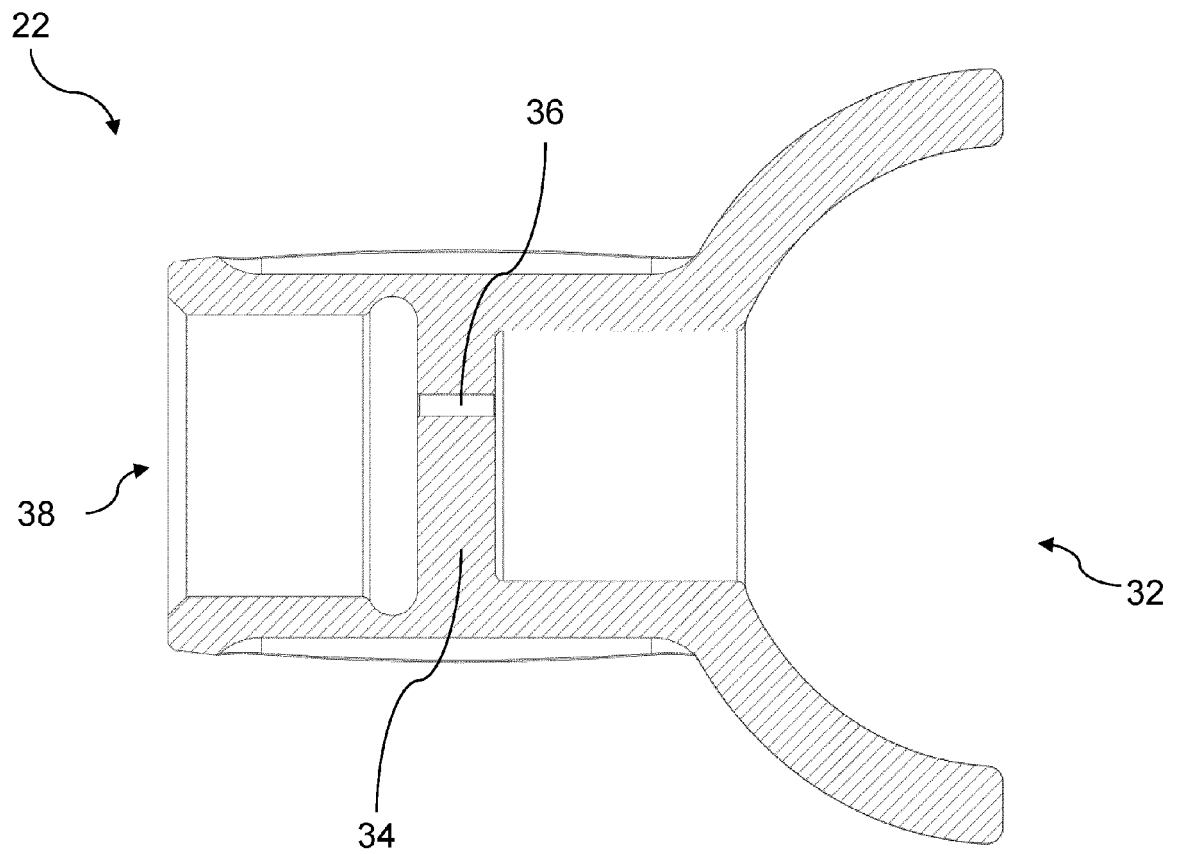


Fig. 5

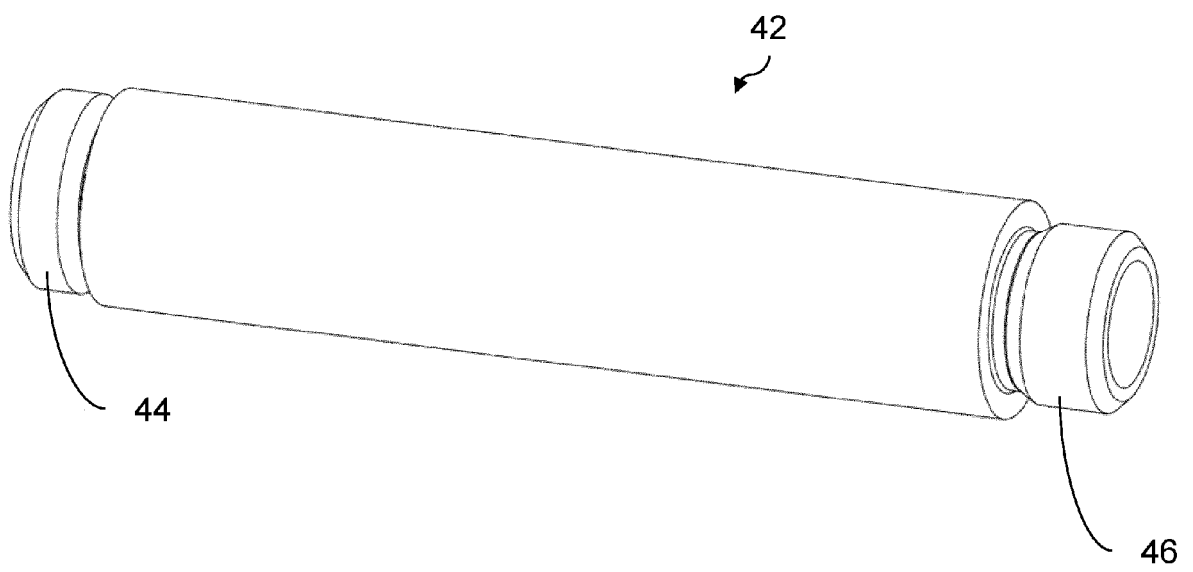


Fig. 6

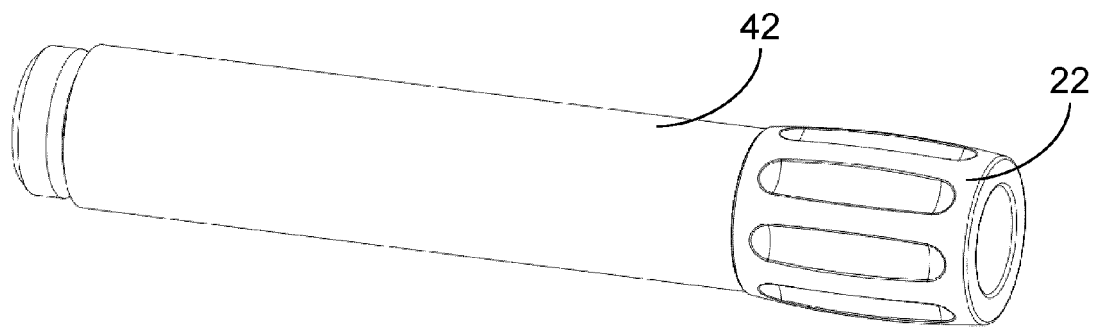


Fig. 7



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Place of search		Date of completion of the search	Examiner
Munich		11 January 2024	Schultz, Tom
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