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FILLER SUPPORT FOR VACUUM BOTTLES

Filed July 17, 1958

2 Sheets-Sheet 1

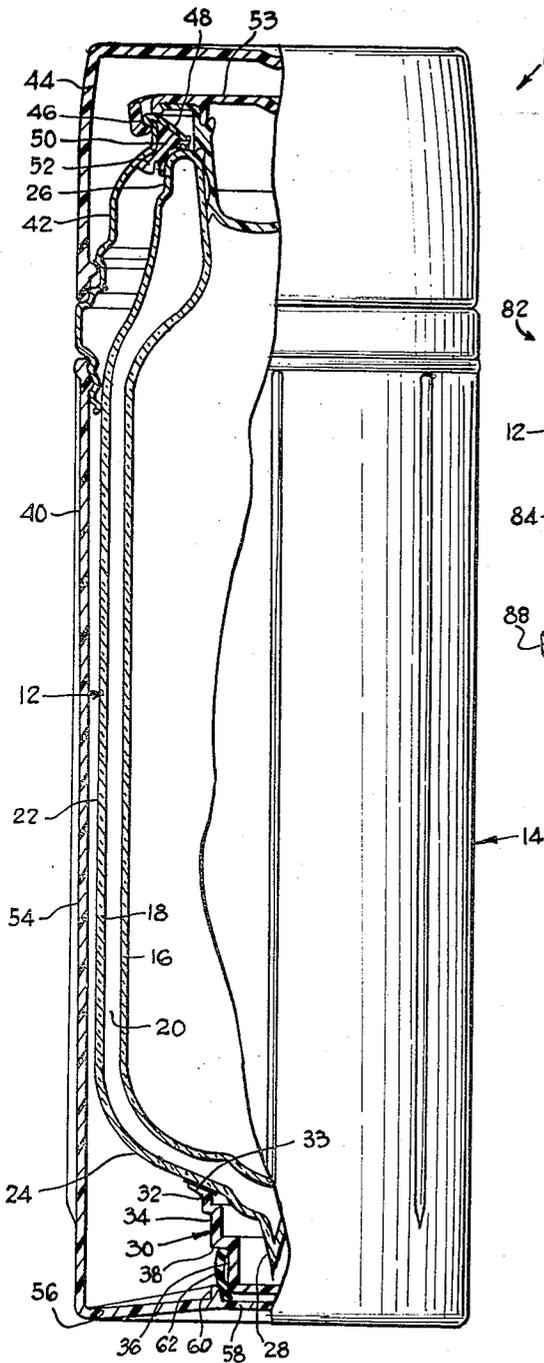


Fig. 1

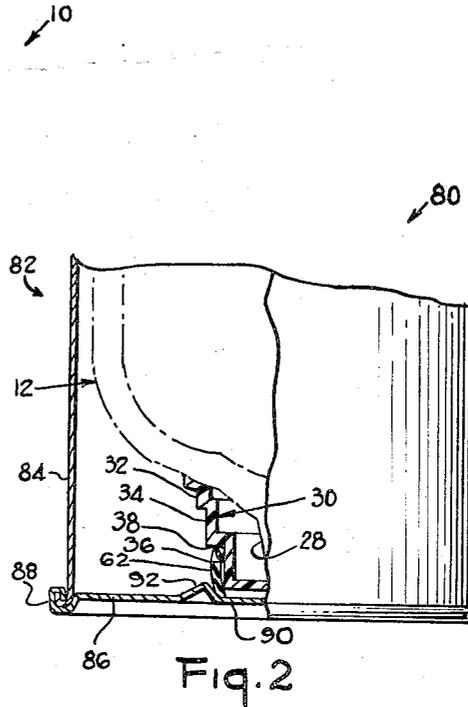


Fig. 2

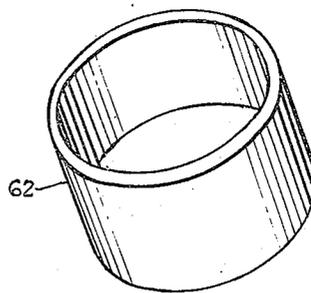


Fig. 3

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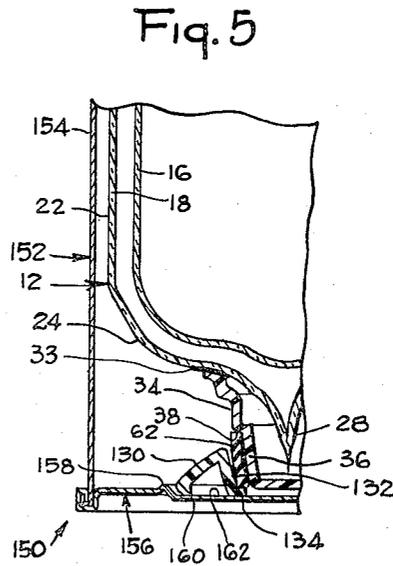
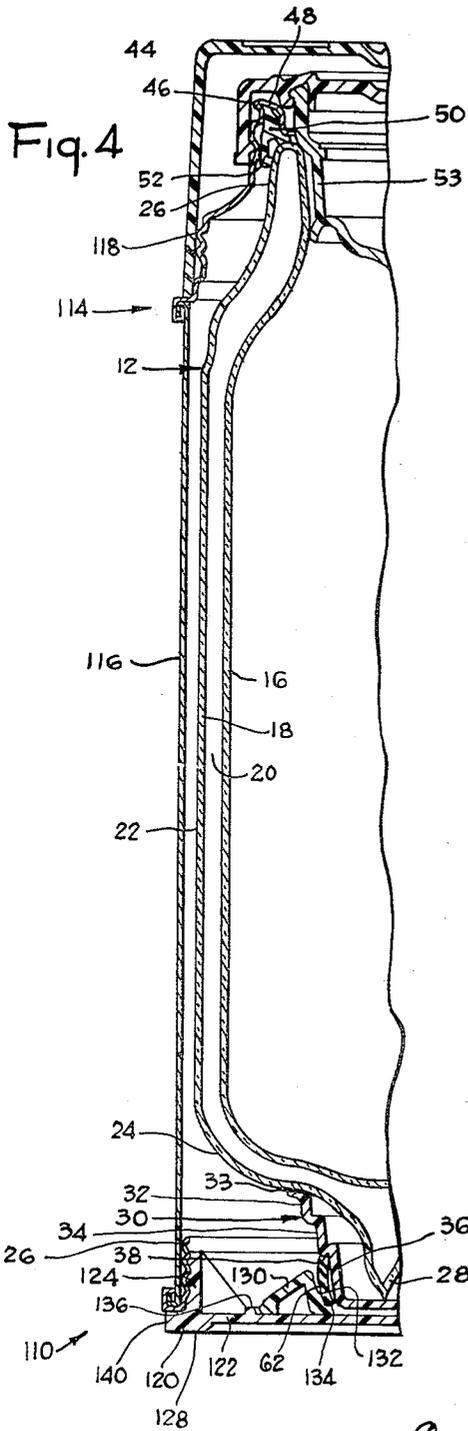
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2 Sheets-Sheet 2



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FILLER SUPPORT FOR VACUUM BOTTLES

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4 Claims. (Cl. 215-13)

This invention relates to vacuum bottles of the well-known type having a vacuum insulated filler mounted within a protective jacket.

One object of the present invention is to provide a vacuum bottle having new and improved means for resiliently supporting the lower end of the filler on the lower wall of the jacket in a vacuum bottle, so that the filler will be pressed snugly in an upward direction against the means which retains the upper end of the filler in the jacket.

A further object is to provide a new and improved filler supporting arrangement of the foregoing character which is highly effective, yet is remarkably simple in construction and low in cost.

Another object is to provide a filler supporting arrangement which greatly facilitates the assembly of the vacuum bottle.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying sheet of drawings in which:

Fig. 1 is an elevational view of vacuum bottle to be described as an illustrative embodiment of the present invention, the view being partly in longitudinal section.

Fig. 2 is a fragmentary view similar to Fig. 1, but showing a slightly modified construction.

Fig. 3 is a perspective view of a resilient filler supporting member utilized in the vacuum bottles of Figs. 1 and 2.

Fig. 4 is a fragmentary elevational section showing another modified construction.

Fig. 5 is a fragmentary elevational section showing still another modification.

It will be seen that Fig. 1 illustrates a vacuum bottle 10 of the well-known general type having a vacuum insulated filler or receptacle 12 mounted within a protective jacket 14. The filler 12 is constructed in the usual manner, with inner and outer walls 16 and 18, preferably made of glass, with an evacuated space 20 therebetween. It will be seen that the filler 12 is of the usual elongated shape and thus has a substantially cylindrical side wall portion 22 which is closed at its lower end by a bottom wall portion 24. At its upper end, the filler 12 narrows down to a neck portion 26. In the center of the lower portion 24, the outer wall 18 has a downwardly projecting sealed tubulation 28, through which the air is evacuated from the space 20 prior to the sealing of the tubulation.

It will be understood that the tubulation 28 is highly fragile and thus must be protected from contact with the jacket 14. For this purpose, the filler 12 is fitted with a generally cup-shaped protector 30 to cover the tip or tubulation 28. The protector 30 may be made of plastic or any other suitable material and may be cemented or otherwise secured to the lower wall portion 24 of the filler. In this case, a layer of cement 33 is employed. The cup-shaped cavity within the protector 30 is of sufficient size to enclose the tubulation 28 completely and thus protect it from breakage. For a purpose to be

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made clear shortly, the protector 30 has a stepped side wall with an upper portion 32, an intermediate portion 34 and a lower portion 36 of successively smaller diameters. A downwardly facing shoulder 38 is formed between the intermediate and lower portions 34 and 36.

The jacket 14 may be constructed in a variety of ways. It will be seen that the illustrated jacket 14 is made in two parts, a lower part 40 in the shape of an elongated receptacle and an upper annular part or collar 42. In this case the lower part 40 is made of plastic, while the collar 42 is made of metal, but any suitable materials may be employed. The collar 42 is shown as being threaded into the lower part 40 of the jacket, but any suitable type of connection may be employed. Preferably, the jacket is arranged so that the collar 42 is readily removable from the lower part 40 so that the filler 12 may easily be removed for occasional thorough cleaning or replacement.

In accordance with the usual arrangement, a cup 44 is adapted to be threaded on to the collar 42 with the cup in an inverted position to cover the upper ends of the collar and the filler 12. Of course, the cup 44 may be used for drinking purposes when removed from the collar.

In this case, the collar 42 is formed outwardly at its upper end into an overhanging annular pouring lip 46. An annular flange 48 projects inwardly and downwardly from the pouring lip 46. It will be apparent that the flange 48 overhangs the upper end of the neck portion 26 on the filler 12 so as to retain the filler in the jacket 14 against upward movement through the open upper end of the collar 42. A resilient annular gasket or sealing ring 50 is interposed between the flange 48 and the upper end of the neck portion 26 to cushion the upper end of the filler and prevent leakage of liquids between the filler and the flange. The sealing ring 50 has a skirt portion 52 which effectively centers the neck 26 of the filler within the upper end of the collar 42. A stopper or other closure 53 is adapted to be inserted into the neck of the filler 12. In this case, the stopper is arranged to be locked in a disengageable manner onto the pouring lip 46.

It will be apparent that the lower jacket member 40 is formed in one piece with a generally cylindrical side wall 54 which is closed at its lower end by a bottom wall 56. As illustrated, the bottom wall is upwardly domed to a slight extent so as to form a raised central portion 58. An annular rib or retainer 60 is formed on the upper side of the bottom wall 56 around the raised central portion 58.

Provision is made for resiliently supporting the lower end of the filler 12, while centering the filler within the lower jacket member 40. In this case, these functions are carried out in a highly advantageous but remarkably simple manner by interposing a resilient sleeve or ring 62 between the filler and the bottom wall 56 of the jacket. The sleeve 62 is made of natural or synthetic rubber, or any other suitable soft, resilient material. It will be seen that the sleeve 62 is substantially cylindrical in form. The upper portion of the sleeve 62 is received with a moderately close fit around the lower cylindrical side wall portion 36 of the tip protector 30. It will be apparent that the upper end of the sleeve abuts against the downwardly facing shoulder 38 on the tip protector. At its lower end, the sleeve 62 projects below the tip protector 30 and is adapted to be supported on the raised central portion 58 of the bottom wall 56. The lower end of the sleeve is snugly received within the annular rib or retainer 60 to locate the sleeve in a central position within the jacket 14. The resiliency of the sleeve 62 presses the filler 12 upwardly so that the upper end of the filler firmly engages the sealing ring

50. Thus, the filler is held against end play within the jacket. It will be apparent that the inner diameter of the rib 60 corresponds to the outer diameter of the sleeve 62, while the inner diameter of the sleeve corresponds to the outer diameter of the lower portion 36 of the tip protector 30. To compensate for slight variations in the length of the glass filler 12 and to provide for the exertion of upward resilient pressure, the resilient sleeve 62 is adapted to bulge outwardly at its central portion as clearly shown in Fig. 1. Thus, the sleeve 62 is normally bulged so as to be slightly barrel shaped in its position of use. To enable the sleeve 62 to bulge in this manner, the length of the sleeve is made several times its wall thickness.

The provision of the resilient supporting sleeve 62 greatly facilitates the assembly of the vacuum bottle. After the filler 12 has been completed, the tip protector 30 is cemented in place. The resilient sleeve 62 is then slipped onto the reduced lower portion 36 of the tip protector. Preferably, the fit between the sleeve 62 and the lower portion 36 is made sufficiently snug to prevent the sleeve from falling off the tip protector accidentally. At the same time, the fit is made sufficiently free so that the sleeve may readily be mounted on the tip protector. Actually, the fit is not particularly critical because of the resilient character of the sleeve 62. It is then a simple matter to insert the filler 12 into the lower jacket portion 54 with the filler centered so that the sleeve 62 will be received within the annular rib 60. The collar 42 is then screwed into the lower jacket member 40 with the gasket 50 between the collar and the upper end of the filler. The gasket may be mounted on the upper end of the filler before the collar is mounted on the jacket. Alternatively, the gasket may be inserted into the upper end of the collar before the collar is screwed into the lower jacket member.

The collar 42 is screwed down snugly so as to compress the resilient sleeve endwise to some extent. The filler will thus be urged upwardly in a resilient manner by the sleeve, so as to prevent end play between the filler and the jacket. The upward resilient force on the filler also assures a perfect seal between the upper end of the filler and the gasket 50. As already indicated, the sleeve 62 bulges outwardly in a resilient manner when the sleeve is compressed endwise. Thus, the sleeve is slightly barrel shaped in its position of use. In this way, the sleeve may be compressed endwise to a substantial extent, so as to compensate for any slight variations in the length of the glass filler. In mass production operations, it is extremely difficult to hold glass items, like the filler 12, to exact dimensions without appreciable variations. The resilient supporting ring 62 permits the use of fillers that might otherwise have to be rejected because of variations from the normal length. The screw connection between the collar 42 and the lower jacket member 40 also provides a measure of adjustability to compensate for variations in the length of the filler.

Fig. 2 illustrates a slightly modified vacuum bottle 80 which is the same as the vacuum bottle of Fig. 1 except that the lower jacket member 40, made of plastic, is replaced with a metal member 82. As shown, the metal jacket 82 is made like a can with a cylindrical side wall 84 and a bottom wall 86 formed as separate pieces and secured together by a crimped or rolled joint 88, which may also be soldered if desired. In this case, virtually the entire bottom wall 86 is raised slightly. The wall 86 is formed with a central portion 90 and is provided with an annular rib or retainer 92 adapted to receive the lower end of the resilient sleeve 62.

In each of the embodiments of Figs. 1 and 2, the central portion of the bottom wall on the jacket is raised slightly above the lower extremity of the jacket so that the central portion will not come into engagement with a table top or other supporting surface when the vacuum

bottle is set down or dropped. This arrangement prevents the transmission of undue shock to the lower portion of the filler.

Another modified arrangement is shown in Fig. 4, which illustrates a vacuum bottle 110, similar to the vacuum bottle of Fig. 1, except for various features to be described specifically. The vacuum bottle 110 utilizes the filler 12, the cup 44, the gasket 52, and the resilient supporting sleeve 62 of Fig. 1. However, the vacuum bottle 110 is provided with a modified jacket 114 having a cylindrical side wall 116, which, as shown, is made of metal but may be of any suitable material. At its upper end, the jacket 114 is fitted with a collar 118, which is similar to the collar 42 of Fig. 1, except that the collar 118 is permanently crimped or otherwise secured to the upper end of the cylindrical side wall 116. The bottom closure 120 is adapted to be screwed into or otherwise disengageably secured to the lower end of the cylindrical side wall 116. As shown the closure 120 is made of plastic, but it may be made of any suitable material. Illustrated closure 120 is in the form of disk-like member or web 122, having an upwardly projecting peripheral flange 124 thereon. It will be seen that the outside of the flange 124 is threaded for engagement with a threaded metal collar 126 mounted within the lower end of the cylindrical side wall 116, and crimped or otherwise secured thereto. A downwardly projecting peripheral rib 128 is formed on the closure 120 so that the disk portion 122 will be raised slightly above any supporting surface upon which the vacuum bottle may be placed.

In this case, a ring or seat member 130 is interposed between the soft resilient supporting sleeve 62 and the closure member 120. It will be seen that the ring 130 has an opening 132 therein to receive the lower portion of the sleeve 62. An inwardly projecting flange 134 is provided on the ring 130 at the lower end of the opening 132 to support the lower end of the resilient sleeve 62. Illustrated ring 130 is centered in the jacket 114 by means of an upwardly projecting annular rib 136 formed on the closure 120. The ring 130 is adapted to be received in and located by the rib 136.

The fit between the resilient supporting sleeve 62 and the opening 132 may be made fairly close so that the sleeve will be frictionally retained within the opening. Thus, the sleeve 62 and the ring 130 may be put together as a subassembly. The sleeve 62 may then be mounted on the reduced portion 36 of the tip protector 30 at the lower end of the filler 12. The assembly of the vacuum bottle 110 is completed by inserting the upper end of the filler 12 into the jacket 114 and then screwing in the bottom closure 120 until it is snug. It will be seen that the bottom closure 120 has an outwardly projecting peripheral flange 140 adapted to abut against the lower end of the jacket 114. The insertion of the closure 120 compresses the sleeve 62 endwise so that it is bulged outwardly as shown. The resilient compressive force, thus furnished, supports the filler 12 and presses its upper end firmly against the gasket 50.

Fig. 5 illustrates still another modification, in the form of a vacuum bottle 150 having the filler 12 of Fig. 1 and a jacket 152 similar to that of Fig. 2.

Thus, the jacket 152 has a substantially cylindrical side wall 154, made of metal or the like. A bottom wall 156 is crimped or otherwise suitably secured to the side wall 154. Thus, the bottom wall 156 is permanently connected to the side wall. As in Figs. 1 and 2 the jacket 152 is of the top opening type so that the filler may be inserted into the upper end of the sidewall 154 in assembling the vacuum bottle.

The vacuum bottle 150 employs the locating ring 130 of Fig. 4, thus, the rubber or rubberlike supporting sleeve 62 is received in and supported by the ring 130. An annular, upwardly projecting ridge 158 is formed on the bottom wall 156 to center the ring 130 in the jacket 152.

The portion of the bottom wall 156 within the ridge 158 is slightly depressed with respect to the remainder of the bottom wall, as indicated at 160, to form a well 162 in which the ring 130 is received. In other respects, the vacuum bottle 150 of Fig. 5 may be the same as shown in Figs. 1 and 2.

It will be apparent that the resilient sleeve provides a remarkably simple, yet highly effective support for the filler. The filler supporting arrangement greatly facilitates the assembly of the vacuum bottle, yet is extremely economical. Sufficient resiliency is provided by the support to compensate for considerable variation in the length of the filler.

Various other modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims.

I claim:

1. In a vacuum bottle, the combination comprising a vacuum insulated filler having an open upper portion and a closed bottom portion, said bottom portion having a centrally disposed downwardly projecting tubulation thereon, a protective jacket received around said filler, said jacket having a bottom wall and means at the upper end of the jacket for retaining the filler therein, a sealing ring disposed between the upper ends of the jacket and the filler, a tubulation protector secured to said bottom portion of said filler around said tubulation, said protector having a downwardly facing annular shoulder thereon spaced a substantial distance downwardly from the upper end of said protector, said protector having a reduced lower end, extending downwardly from said shoulder said bottom wall having a central portion with upwardly extending locating means therearound, and a soft resilient rubber sleeve interposed between said tip protector and said bottom wall for supporting said filler and resiliently pressing said filler upwardly against said sealing ring, said resilient sleeve being snugly received around and frictionally retained on said reduced lower portion of said tip protector and being received within said locating means for centering said filler in said jacket, the upper end of said sleeve being engaged with said shoulder and being held out of engagement with said filler by said shoulder on said tip protector said sleeve being substantially cylindrical in a free state, said sleeve being several times longer than its wall thickness and being adapted to be bulged outwardly by endwise compression in position of use into a barrel shape.

2. In a vacuum bottle, the combination comprising a vacuum insulated filler having an upper neck portion and a closed bottom portion, said bottom portion having a centrally disposed downwardly projecting tubulation thereon, a protective jacket received around said filler, said jacket having a bottom wall and means at the upper end of the jacket for retaining the filler therein, a sealing ring disposed between the upper ends of the jacket and the filler, a generally cup-shaped tubulation protector secured to said bottom portion of said filler around said tubulation, said protector having a reduced lower end, said bottom wall having a central portion raised above the lower extremity of said jacket and having generally annular upwardly projecting rib means therearound, a resilient sleeve having its upper end received around said reduced lower end of said protector for supporting said filler and resiliently pressing said filler upwardly against said sealing ring, and a locating ring supported on said bottom wall and received within said rib means, said

locating ring having an upwardly facing axially disposed seat therein for receiving and centering the lower end of said sleeve, said sleeve being substantially cylindrical in a free state but being adapted to be bulged outwardly by endwise compression in position of use.

3. In a vacuum bottle, the combination comprising a vacuum insulated filler having an upper neck portion and a closed bottom portion, said bottom portion having a centrally disposed downwardly projecting tubulation thereon, a protective jacket received around said filler, said jacket having a bottom wall and means at the upper end of said jacket for retaining the filler therein, a sealing ring disposed between the upper ends of the jacket and the filler, a generally cup-shaped tubulation protector secured to said bottom portion of said filler around said tubulation, said protector having a reduced lower end, said bottom wall of said jacket having a central portion with generally annular upwardly projecting rib means therearound, a resilient rubber-like sleeve having its upper end received around said reduced lower end of said protector for supporting said filler and resiliently pressing said filler upwardly against said sealing ring, and a locating ring supported on said bottom wall and received within said rib means, said locating ring having an upwardly facing axially disposed seat therein for receiving and centering the lower end of said sleeve, said sleeve being substantially cylindrical in a free state but being adapted to be bulged outwardly by endwise compression in position of use.

4. In a vacuum bottle, the combination comprising a vacuum insulated filler having an open upper portion and a closed bottom portion, said bottom portion having a centrally disposed downwardly projecting tubulation thereon, a protective jacket received around said filler, said jacket having a bottom wall and means at the upper end of the jacket for retaining the filler therein, a sealing ring disposed between the upper ends of the jacket and the filler, a tubulation protector secured to said bottom portion of said filler around said tubulation, said protector having a downwardly facing annular shoulder thereon, said protector having a reduced lower end extending downwardly from said shoulder, said bottom wall having a central portion with upwardly extending locating means therearound, and a soft resilient rubber sleeve interposed between said tip protector and said bottom wall for supporting said filler and resiliently pressing said filler upwardly against said sealing ring, said resilient sleeve being snugly received around and frictionally retained on said reduced lower portion of said tip protector and being received within said locating means for centering said filler in said jacket, the upper end of said sleeve being engaged with said shoulder and being held out of engagement with said filler by said shoulder on said tip protector, said sleeve being substantially cylindrical in a free state, said sleeve being several times longer than its wall thickness and being adapted to be bulged outwardly by endwise compression in position of use into a barrel shape.

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