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(54) MIXING AND DISTRIBUTING APPARATUS  
 FOR GASOLINE AND OIL

(71) We, SATAM INDUSTRIES, a Société Anonyme organised under the laws of 93 123 La Courneuve, France, do hereby declare the invention for which we pray  
 5 that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a mixing  
 10 and distributing apparatus for gasoline and oil.

Gasoline and oil mixing apparatuses comprise generally a mixing cylinder in which  
 15 a pre-selected quantity of oil is discharged through the agency of a metering device situated adjacent the cylinder and includes a cylinder-piston assembly.

Such apparatuses have the disadvantage of requiring an auxiliary system with a  
 20 metering device control regulated by the gasoline inlet control and they occupy a large space.

An aim of the invention is to remedy these disadvantages.

25 According to the invention there is provided a mixing and distributing apparatus for gasoline and oil comprising an oil tank, an inlet duct for gasoline under pressure and a delivery duct, a first vertical cylinder  
 30 fed from the top with oil and gasoline through a slide-valve distributing unit in which slides a first piston called a distribution piston biased upwards by a spring, the cylinder being connected to the delivery  
 35 duct *via* the distributing unit, a second vertical cylinder located inside the first cylinder, under the first piston, in which slides a second piston called an oil piston, the lower portion of the second cylinder being  
 40 connected with the upper portion of the first cylinder and with the oil tank *via* the distributing unit, a first position of the distributing apparatus causing the first cylinder to be fed with gasoline under pres-  
 45 sure which causes a downward motion of

the first piston against the biasing spring, the motion driving in turn by means of appropriate abutment means and in the final portion of its stroke, the downward  
 50 motion of the second piston and the metered supply of oil of the first cylinder, a second position of the distributing apparatus causing the oil and gasoline supply to be stopped and the mixture being then  
 55 expelled by the first cylinder piston under the effect of the biasing spring.

Preferably the abutment means comprises shoulders formed inside the first piston, co-acting with a peg-shaped part arranged  
 60 transversely at the upper portion of the second piston. The shoulders are arranged inside the first piston along two circular helices, each shoulder of a helix being di-  
 65 ametrically opposite a shoulder of the other helix and on the same level corresponding to a percentage of oil to be mixed with the gasoline.

Conveniently the second cylinder is rotatably mounted and its rotation provides the possibility of positioning the peg-shaped part  
 70 of the second piston opposite the shoulders corresponding to the selected oil percentages.

An embodiment of the mixing and distributing apparatus according to the invention,  
 75 will now be described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 shows a longitudinal cross-section of the apparatus according to the invention in its admission condition;  
 80

Figure 2 shows a similar view to Figure 1 of the apparatus according to the invention at the beginning of the delivery phase;

Figure 3 is a view from underneath of the mixing piston according to the inven-  
 85 tion; and

Figure 4 is a cross-section taken along the line IV-IV of Figure 3.

Referring now to the drawings in detail the apparatus comprises a distribution unit  
 90

1 and a lower support 3 between which are located a mixing cylinder 2 and an oil cylinder 12, one arranged vertically adjacent to the other.

5 Inside the mixing cylinder 2 and concentric therewith is a second oil cylinder 10, rotatably mounted and communicating with cylinder 12 *via* a channel located in the support 3. The cylinder 10 is provided with an  
10 oil piston 11 which is operatively connected for rotation and comprises at its upper end a transverse part 13, sliding in longitudinal slots 14 of the oil cylinder 10. Piston 11 is biased upwards by a spring 16 bearing on  
15 support 3 and part 13. The rotation of oil cylinder 10 is controlled by knob 15 calibrated in terms of percentages of the mixture (for example 0%. 2. 4. 5. 6. 8%).

Inside the mixing cylinder 2, above the  
20 oil cylinder 10 is a mixing piston 4, fixed in rotation due to a pin 7 sliding within a slot 8 formed in the mixing cylinder wall 2. The mixing cylinder 4 has an outside cylindrical shape. The inner portion com-  
25 prises two series of shoulders 6 arranged stepwise along two circular helixes on the inner side of the mixing piston wall 4. The series comprise an equal number of  
30 shoulders. As is shown in Figure 3, each of the shoulders 6 corresponds to a percentage of the mixture. The shoulders 6 of either series corresponding to the same per-  
centage are in a diametrically opposite relationship on the piston wall and on the  
35 same level.

The distribution unit 1 comprises throttle valve e.g. a rotary valve 17 controlled by a lever 22. The unit is connected with the  
40 oil tank 21 and a gasoline inlet 19 on the one hand, and with the mixing cylinder 2, the oil cylinder 12 and a delivery channel 20 on the other hand. The rotary valve is formed with perforations for allowing  
45 passage for the oil, the gasoline or the mixture thereof, or for preventing their passage. It may assume two positions determined by an abutment member located on a part 18 formed integrally with the distribution unit  
1.

50 The operation of the apparatus is as follows:

The operative starts by selecting the oil percentage required by turning the knob  
55 15 so as to bring the corresponding digit in register with an index. This operation also brings the ends of part 13 in a position opposite the mixing piston shoulders 6 corresponding to the required percentage. Thereafter, and by means of lever 22, the  
60 operative turns the rotary valve 17 until it is stopped by an abutment, thus providing a through passage for the oil cylinder 12 on the one hand, and the gasoline inlet  
65 19 on the other hand with the mixing cylinder 2 above the mixing piston 4. The pres-

sure of the gasoline urges piston 4 down-  
wards against the strength of spring 9. When the shoulders corresponding to the required  
mixture come to abut against part 13, the  
70 oil piston 11 is driven in turn against the strength of spring 16 and delivers the oil contained in the oil cylinders 10 and 12 to the mixing cylinder, above the mixing  
piston 4. When the cylinder pin 7 comes to  
75 abut against the lower end of the slot 8, the operative rotates the rotary valve 17 in the reverse direction until it is stopped by  
an abutment, and by so doing, he provides  
a through passage between the mixing  
cylinder 2 and the delivery duct 20, he stops  
80 the passage between the gasoline inlet 19 on the one hand, the oil cylinder 12 on the other hand and the mixing cylinder 2, and he opens the passage between the oil tank  
21 and the oil cylinder 12. 85

Under the effect of spring 9, the mixing  
cylinder 4 moves upwards, expelling the  
mixture from the delivery duct 20.

The piston 11 also moves back upwards  
under the effect of spring 16 up to the abut-  
90 ment of part 13 against the upper end of the slots 14. The oil moves then again up-  
wards inside cylinder 10.

WHAT I CLAIM IS:—

1. A mixing and distributing apparatus 95  
comprising an oil tank, an inlet duct for gasoline under pressure and a delivery duct, a first vertical cylinder fed from the top with oil and gasoline through a throttle valve  
distributing unit in which slides a first piston 100  
called a distribution piston, biased upwards by a spring, said cylinder being connected to the delivery duct *via* the distributing unit, a second vertical cylinder located inside the  
first cylinder, under the first piston, in which  
105 slides a second piston called an oil piston, the lower portion of the second cylinder being connected with the upper portion of the first cylinder and with the oil tank *via*  
the distributing unit, a first position of the  
110 distributing apparatus causing the first cylinder to be fed with gasoline under pressure causing a downward motion of the first piston against the biasing spring, the motion  
driving in turn by means of appropriate  
115 abutment means and in the final portion of its stroke the downward motion of the second piston and the metered supply of oil of the first cylinder, a second position  
of the distributing apparatus causing the oil  
120 and gasoline supply to be stopped, the mixture then being expelled by the first cylinder piston under the effect of the biasing spring.

2. An apparatus according to claim 1,  
wherein the abutment means comprises  
125 shoulders formed inside the first piston, co-acting with a peg-shaped member arranged transversely in the upper portion of the second piston.

3. An apparatus according to claim 2,  
wherein the shoulders are arranged inside 130

the first piston along two circular helixes, each shoulder of one helix being in diametrically opposed relationship with the shoulder of the other helix and at the same level corresponding to a percentage of oil to be mixed with the gasoline.

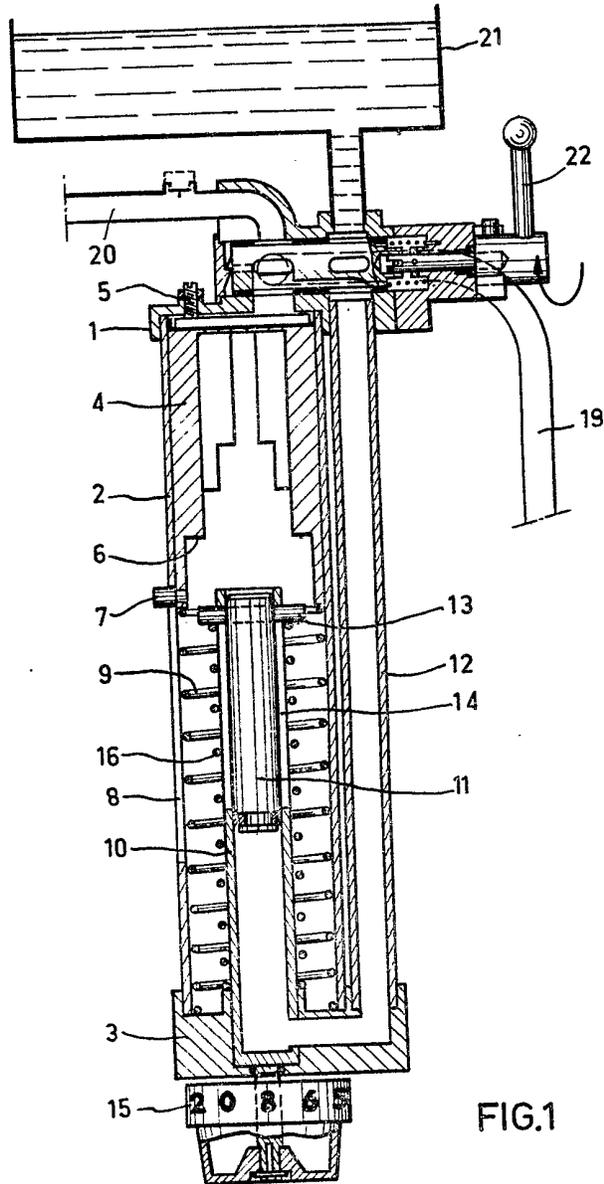
4. An apparatus according to any of the preceding claims wherein the second cylinder is rotatably mounted, its rotation providing the possibility to position the peg-shaped member of the second piston in register with the shoulders corresponding to the selected oil percentage.

5. An apparatus according to any of the preceding claims wherein the throttle valve of the distribution unit assumes two positions, one of which allowing passage for the gasoline under pressure and of the oil driven

by the second piston in the upper portion of the first cylinder and the other providing on the one hand passage for the mixture situated in the upper portion of the first cylinder towards the delivery duct and on the other hand the passage of the oil from the tank towards the second cylinder.

6. A mixing and distributing apparatus substantially as herein described with reference to and as shown in the accompanying drawings.

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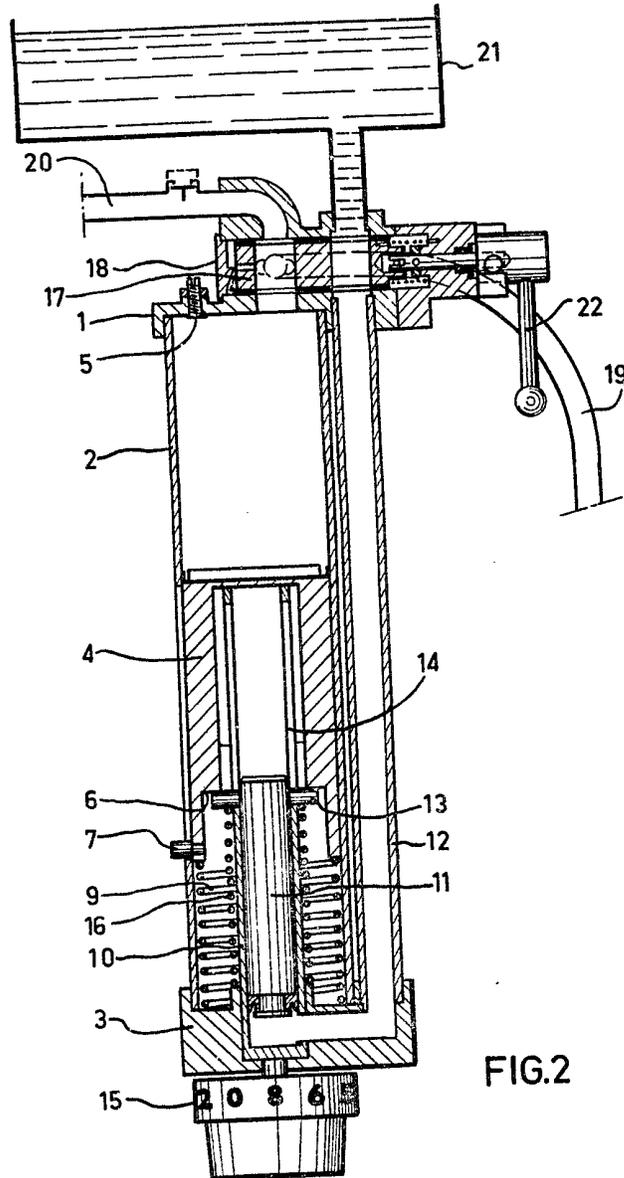


FIG. 2

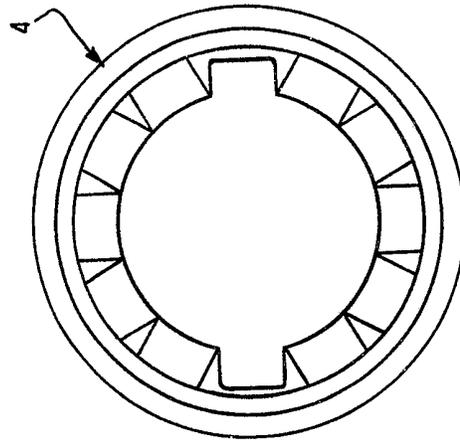


FIG. 3

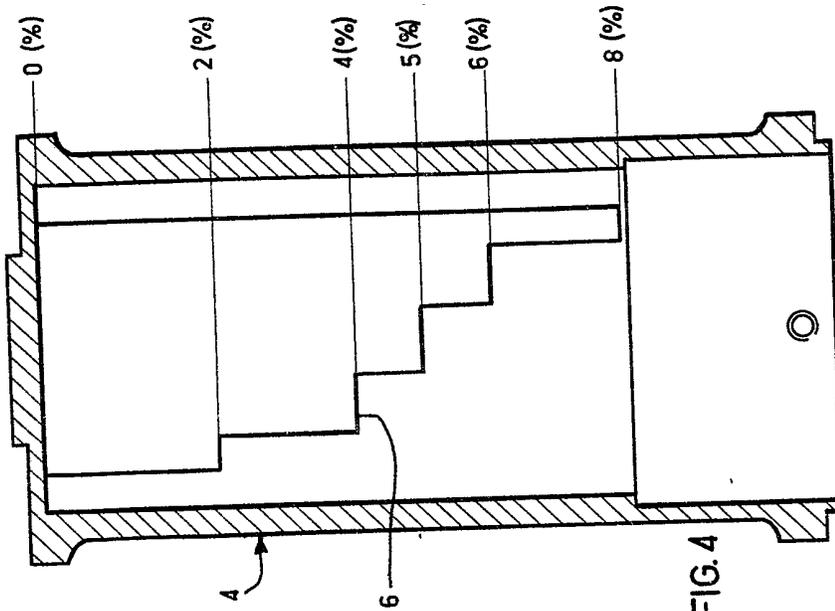


FIG. 4