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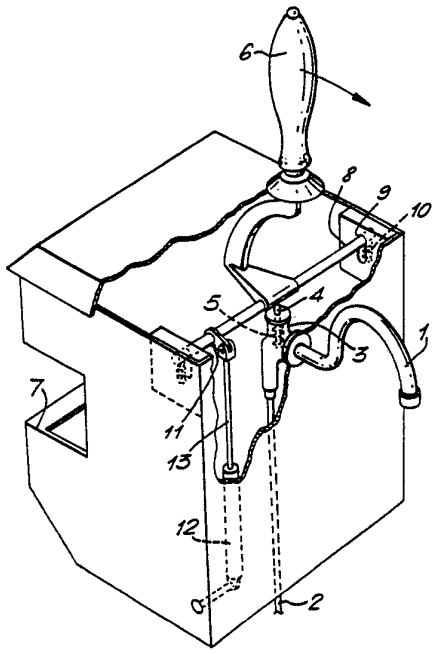
(57) Abstract

A beer engine is provided that simulates a traditional beer engine/hand-pull, i.e. beer or the like is only dispensed while an operating handle is being pulled. Pivotal movement of the handle (6) towards a user about a pivot axis (8) causes translational movement of the pivot axis in order to operate a valve (3) to permit beer or the like to be dispensed. Upon this pivotal movement of the handle (6) being stopped or reversed, spring means (5, 10) urge the pivot axis in the opposite direction to allow the valve to close automatically.



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BEER ENGINE

This invention relates to a beer engine, and in particular to a beer engine that simulates a traditional beer engine/hand-pull. It should be noted at this point that although this specification refers to beer engines and like expressions, this is for simplicity of terminology only and the invention is not to be regarded as being limited to the dispensing of beer, but may also be applied to the dispensing of like beverages such as cider.

Traditional beer pulls employ a manual pump that is operated directly by pulling on a handle. Such traditional beer engine/hand-pulls have, however, certain disadvantages, especially where the beer is carbonated and is kept under CO_2 pressure. The manual pump acts to suck CO_2 out of the beer and to produce break-out and fobbing rendering any dispense into a glass almost impossible. Accordingly it is desired to provide a beer engine that adequately dispenses carbonated or non-carbonated beer or the like, while simulating the action of a conventional traditional beer pull. A number of such simulated beer engines have been proposed. In one known apparatus, for example, pulling of the handle applies an hydraulic pressure to a diaphragm which in turn operates an on/off valve in the beer supply line. The hydraulic line includes a one-way flow restrictor which has the effect of generating the necessary hydraulic pressure on the diaphragm only when the handle is being pulled in one direction. When the movement of the handle is stopped or reversed this hydraulic pressure is released from the diaphragm to turn the valve off and thus stop further flow of beer. With this arrangement the handle has to be pulled continuously in one direction to keep the valve turned on and thus maintain a flow of beer. Furthermore, since

the handle is pulled against hydraulic pressure, the "feel" of a traditional beer engine/hand-pull is maintained. Thus, this prior arrangement simulates a traditional beer engine. It is, however, not satisfactorily reliable in its operation, is mechanically complex and costly.

Viewed from one broad aspect the present invention provides a beverage dispense system comprising an outlet tap, a valve for disposition in use between a pressurised beverage source and said outlet tap, and an operating handle pivotable about an axis, the arrangement being such that pivotal movement of said handle about said axis in one direction causes translational movement of said axis against a bias means, and wherein said translational movement of said axis causes said valve to be opened to permit a flow of beverage, said biasing means causing reverse translational movement of the axis to close the valve when pivotal movement of the handle is ceased or reversed.

With this arrangement pivotal movement of the handle must occur for the valve to be opened. Thus to dispense e.g. beer or cider the handle must be pulled. If movement of the handle is stopped either at the end of or part way through its stroke then the flow of beverage will stop and will not recommence until the handle is pulled again. The arrangement is such that pivotal movement in one direction only will cause the valve to open, this direction being chosen to correspond to the direction of the handle as it is pulled towards a user's body. The translational bias means not only ensures that the handle must be kept moving in order to maintain a flow of beverage, but also ensures that a certain degree of effort is required to maintain the valve open during pulling. The strength of biasing means is chosen so that the pivot axis is moved to open the valve in response to pivoting movement of the handle, but when this ceases, the axis is urged back to

its original position, a user's normal grip on the handle not having sufficient leverage to prevent this. The impression of a traditional beer engine may be augmented preferably by associating with the handle a damping means, preferably gas-filled, hydraulic or pneumatic, which further ensures that a degree of effort is required to pull the handle. The damping means is arranged to provide a greater resistance to pivotal movement towards the users body than in the reverse direction, to mimic the "feel" of a beer engine.

The arrangement in accordance with the invention is mechanically less complex, less costly and more reliable than known such beer engine resembling dispense systems.

In one embodiment the handle is connected to a pivot shaft such that pivotal movement of the handle in one direction urges the pivot shaft to co-operate with a part of the valve so as to open the valve. Preferably opposed ends of the pivot shaft are mounted in elongate bearings, the bearings including spring means for biasing the pivot shaft into a position in which the valve remains closed.

In another preferred embodiment the handle is pivotally connected to the pivot axis via a quadrant member and upon rotation of the handle about the axis the quadrant member is caused to act upon an end of a valve rod or other such part so as to open the valve. Again the pivot axis has opposed ends mounted in bearings which are provided with springs for urging the quadrant member out of engagement with the valve rod.

Preferably the quadrant member acts upon the valve rod through a follower member, and more preferably the quadrant member comprises a recessed portion such that upon completion of a stroke of the handle to dispense beer, the end of the follower member is caused to engage the recessed portion so as to cause the valve to close.

While the bias means preferably includes spring means for acting on the pivot axis to urge it in a

direction opposite to that required to operate the valve, the bias means may additionally or alternatively include means within the valve itself to urge the valve into a spring closed condition.

The translational movement of the pivot axis need not be linear, but may be non-linear, e.g. arcuate. Such a situation arises, for example, in a modified embodiment in which the pivot axis is not guided in its movement by elongate bearings, but by means of a linkage connected between the pivot axis and a fixed point. In one such modified embodiment the linkage comprises an arm pivotally connected at one end to the bottom of a damper cylinder, and at its other end to the pivot axis. In such modified embodiments the bias means is preferably provided by spring means associated with the valve, but may additionally or alternatively comprise a spring means acting on the linkage.

Two embodiments of invention will now be described by way of example and with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective partly exploded view of a first embodiment,

Fig. 2 is a side view of a part of the embodiment of Fig. 1,

Fig. 3 is a view similar to Fig. 2 showing the effect of pulling the handle,

Fig. 4 is a side view of a second embodiment,

Fig. 5 is a view similar to Fig. 4 showing the effect of pulling the handle, and

Fig. 6 is a view corresponding to Fig. 4 of a modification of the second embodiment.

Referring firstly to Fig. 1 there is shown a beer dispense unit having an outlet 1 and a line 2 that is connected to a source (not shown) of beer. Also not shown is an electric pump for the supply of beer from the source to the line 2. Between the outlet 1 and the line 2 is disposed a valve 3 that may be opened to

permit flow of beer from line 2 to outlet 1. The valve 3 is opened by pressing a valve rod 4 that extends out of the valve 3. The valve rod 4 is biased by spring means 5 into a normally closed condition.

The dispense unit is operated by pulling handle 6 in the direction shown by the arrow in Fig. 1. This direction normally corresponds to pulling the handle towards the user who has previously located a glass beneath the outlet 1. The dispense unit is fitted to a bar, for example by means of the cut-away portion 7.

The handle 6 is fixedly mounted to shaft 8 such that when the handle is pulled the handle pivots with this shaft about a pivot axis. Opposed ends of the pivot shaft 8 are slidably mounted in vertically elongate bearings 9 made of, for example, nylon. The bearings 9 include biasing springs 10 that act to urge the pivot shaft 8 into its uppermost position.

Also connected to the pivot shaft 8, for example via a linkage 11, is a gas damper unit 12. Gas damper unit 12 includes a gas cylinder having a piston from which extends a piston rod 13 connected to linkage 11. A lower end of the gas damper unit is fixedly connected to the body of the dispense unit.

When the handle 6 is pulled forward in the direction of the arrows in Figs. 1 and 2 since this pivotal movement includes a downward component the pivot shaft 8 is urged in a downward vertical movement within elongate bearings 9 against biasing springs 10, as is shown in Fig. 3. This downward movement of the pivot shaft 8 causes the shaft to act upon valve rod 4 of valve 3 so as to open the valve. Thus, while the handle is pulled forward, the valve is caused to open. When forward movement of the handle 6 is stopped, whether or not the end of the handle stroke has been reached, biasing springs 10 urge the pivotal shaft 8 upwardly so as to remove the shaft from opening engagement with the valve rod 4, as is shown in chain line in Fig. 3. In

practice, this occurs despite a user's normal grip on the handle which does not provide sufficient leverage to maintain the valve open with the handle stationary. The valve 3, by means of biasing spring 5, then returns to its normal closed condition and flow of beer from the source via line 2 to outlet 1 is stopped. The flow of beer will not recommence until the handle is pulled forward again.

The effect of this arrangement is that, as with a traditional manual beer engine/hand-pull, beer is caused to flow from the outlet 1 only when the handle 6 is being pulled forwardly. When the handle is stopped, or when it returns to its original position, no flow of beer takes place. Thus, the beer dispense system simulates a traditional beer engine/hand-pull. To further enhance the simulation of a traditional beer pull the provision of the gas damper unit 12 ensures that a degree of physical effort is required to pull the handle 6 forwardly since downward movement of the pivot shaft to open the valve requires compression of the gas cylinder 12. The amount of effort that is required by a user can be selected by appropriately adjusting the degree of gas damping.

Figs. 4 and 5 show a second embodiment. As in the first embodiment the handle 6' is connected to a pivot shaft 8' through a quadrant member 14'. The pivot shaft 8' is mounted at its opposed ends in horizontally elongate bearings 9' including springs 10' that bias the pivot shaft 8' into the left-hand position shown in Fig. 4.

Between the outlet 1' and the source of beer a valve 3' is disposed in the supply line 2'. The valve 3' may be opened by moving follower member clockwise drawing valve rod 4' to the left, as viewed in the figures. The valve 3' is, however, biased into a normally closed position by spring 5'.

When the handle 6' is pulled forwardly to dispense beer, that is to say clockwise or to the right in the

figures, the pivot shaft 8' is caused to slide in bearings 9' against the biasing of springs 10'. This translational movement of the quadrant member brings it into engagement with a follower member 15 that is pivotally fixed to the end of valve rod 4'. Initial contact of the quadrant member with the follower member causes the latter to pivot clockwise, further lateral movement of the quadrant member, which occurs when maintaining a pivotal motion, acts upon the follower member to urge the rod to the left against the biasing effect of spring 5' so as to open the valve 3' to permit a flow of beer. If pivotal motion of the handle is stopped, the springs 10' urge the pivot shaft 8' to the left in the figures and the valve is closed by spring 5', again as is shown in chain line in Fig. 5.

In this second embodiment, the quadrant member is provided with a recess 16 on the inside of the curve of the quadrant member at the junction between the curved and straight portions of the quadrant member. As the handle 6' is pulled forwardly to cause the handle and quadrant member to pivot in a clockwise direction, a cam member 17 provided on the follower member engages the inner surface of the quadrant member and moves relatively along this inner surface. At the end of the forward stroke of the handle the cam engages the recess and in this position the valve is allowed to close by the effect of spring 5'. In order to recommence a flow of beer, the handle must be returned to its upright position, shown in Fig. 4, to release the cam from the recess and start the operation again. Fig. 5 shows a position of the handle shortly before the cam engages the recess.

It will thus be seen that, as with the embodiment of Figs. 1 to 3, pivotal movement of the handle in a forward, i.e. toward the puller, or clockwise as shown in the figures, direction must be maintained in order for beer to flow. If such pivotal movement of the

handle is stopped at any point, then the effect of the biasing springs is to close the valve. As with the embodiment of Figs. 1 to 3, the second embodiment can also include a hydraulic, pneumatic or gas-filled damping element 12' in the order to generate additional "feel" to further simulate the appearance of a traditional beer engine/hand- pull.

Fig. 6 shows a modification of this second embodiment, the valve mechanism being omitted from the Figure for clarity. The main difference between this modification and the embodiment of Figs. 4 and 5 is that the translational movement of the quadrant pivot axis is not guided in bearings, but rather is guided by means of a linkage disposed between the quadrant pivot axis and a fixed point, in this case the bottom end of the damper cylinder. In particular an arm 18 is provided pivotally mounted at one end to the fixed bottom end of the damper cylinder 12 and at its other end to the quadrant pivot axis 8". Upon pulling the handle to the right, as viewed in Fig. 6, the quadrant pivots about axis 8" in a clockwise sense, and the pivot axis undergoes translational movement to the right to engage and operate the valve in the manner illustrated in Figs. 4 and 5. Unlike Figs. 4 and 5 this translational movement is not purely horizontal, but is in the form of a slight arc with a small downward component since the pivot axis follows an arc of a circle centred on the bottom end of the damper cylinder.

CLAIMS

1. A beverage dispense system comprising an outlet tap, a valve for disposition in use between a pressurised beverage source and said outlet tap, and an operating handle pivotable about an axis, the arrangement being such that pivotal movement of said handle about said axis in one direction causes translational movement of said axis against a bias means, and wherein said translational movement of said axis causes said valve to be opened to permit a flow of beverage, said biasing means causing reverse translational movement of the axis to close the valve when pivotal movement of the handle is ceased or reversed.

2. A system according to claim 1 wherein the handle is connected to a pivot shaft such that pivotal movement of the handle in one direction urges the pivot shaft to co-operate with a part of the valve so as to open the valve.

3. A system according to claim 1 wherein the handle is pivotally connected to the pivot axis via a quadrant member and upon rotation of the handle about the axis the quadrant member is caused to act upon an end of a valve rod or other such part so as to open the valve.

4. A system according to claim 3 wherein the quadrant member acts upon the valve rod through a follower member.

5. A system according to claim 4 wherein the quadrant member comprises a recessed portion such that upon completion of a stroke of the handle to dispense beer, the end of the follower member is caused to engage the recessed portion so as to cause the valve to close.

6. A system according to any preceding claim wherein the pivot axis is guided in said translational movement by mounting opposed ends of the pivot axis in elongate bearings.

7. A system according to any of claims 1 to 5 wherein the pivot axis is guided in said translational movement by means of a linkage connected between the pivot axis and a fixed point.

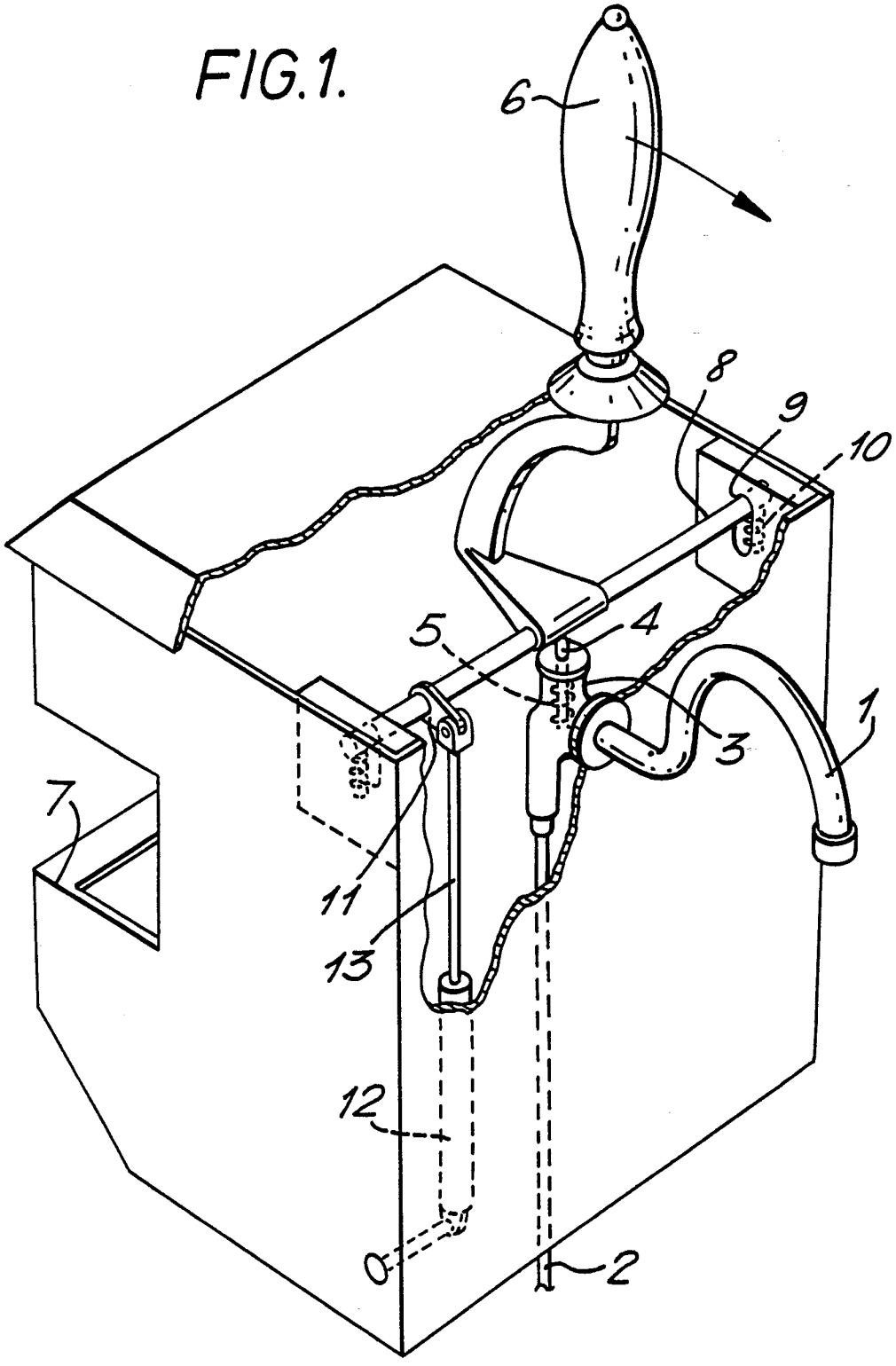
8. A system according to claim 7 wherein said linkage comprises an arm pivotally connected at one end to the pivot axis and at the other end to one end of a damping cylinder operatively connected to said quadrant member.

9. A system according to any of claims 1 to 7 wherein damping means is provided to provide a resistance to movement of the handle in a direction to operate the valve.

10. A system according to any preceding claim wherein said bias means comprises spring means for acting on the pivot axis to urge it in a direction opposite to that required to operate the valve.

11. A system according to any preceding claim wherein said bias means comprises spring means included within the valve to urge the valve into a normally closed condition.

FIG.1.



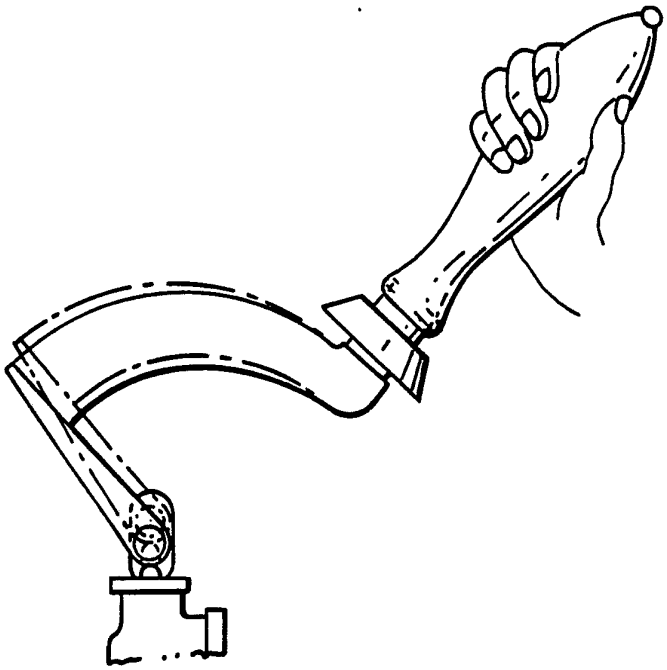
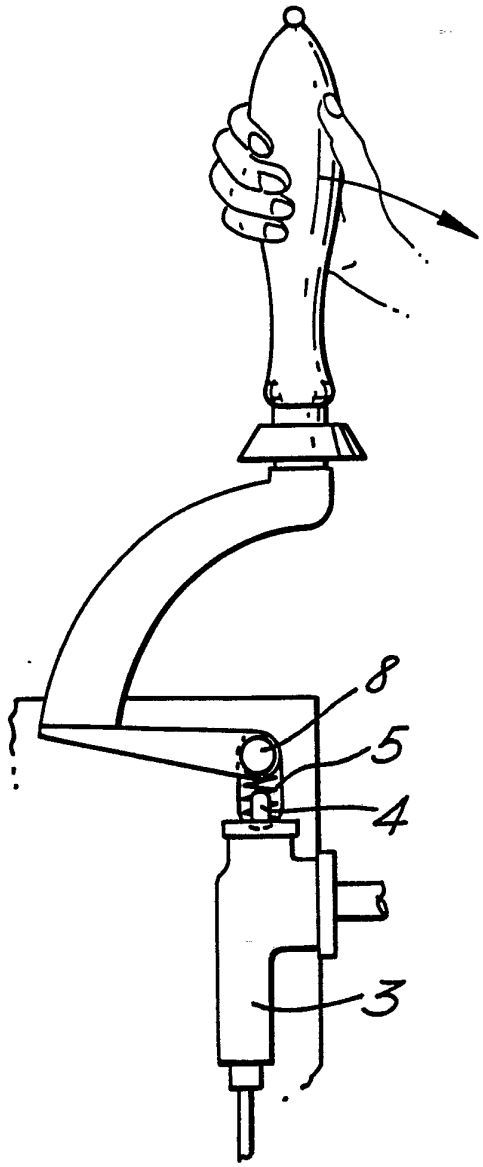


FIG.3.

FIG.2.



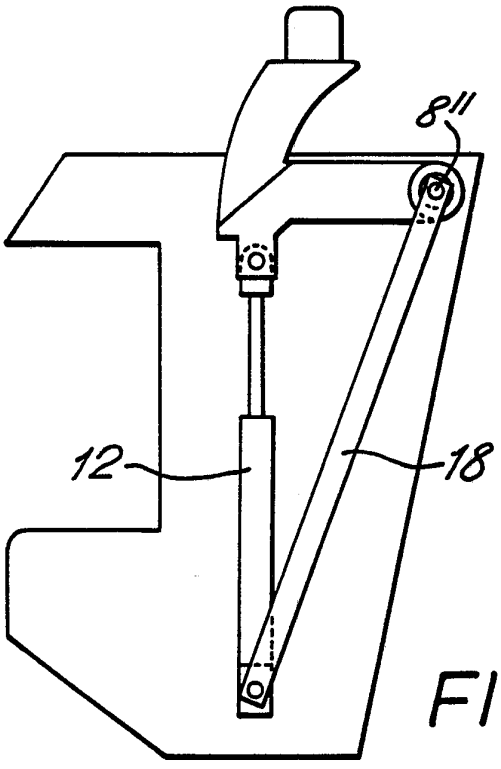


FIG.6.

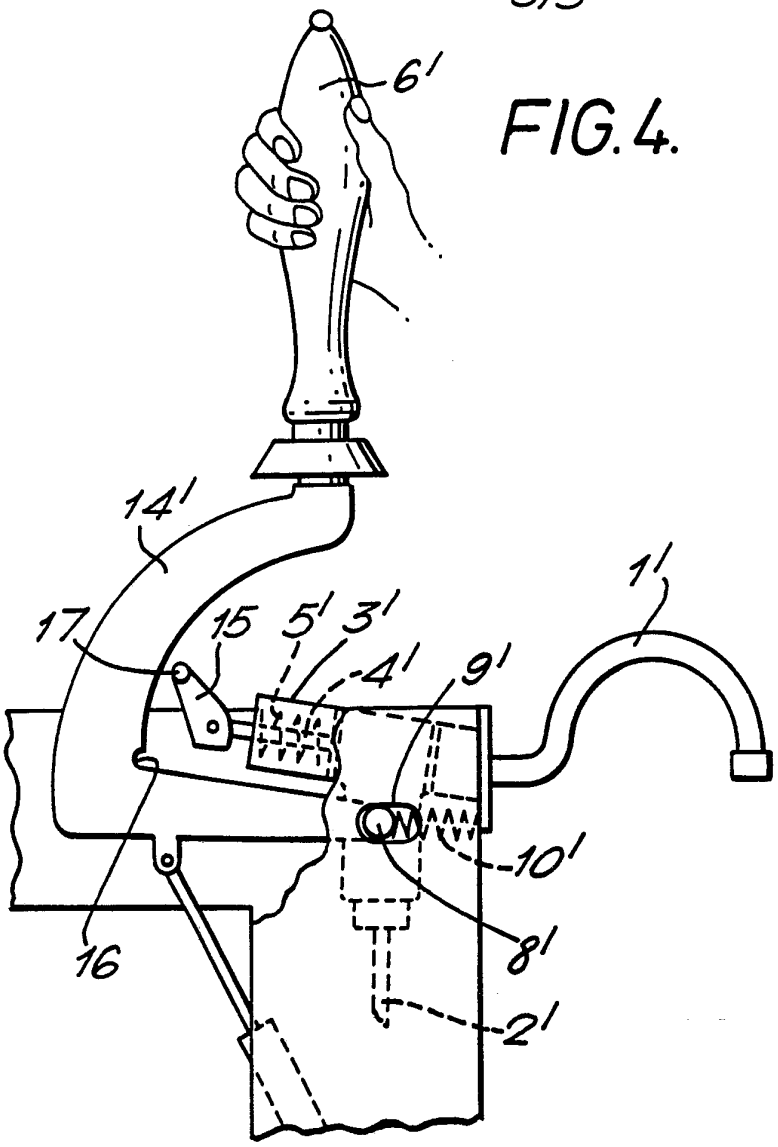


FIG. 4.

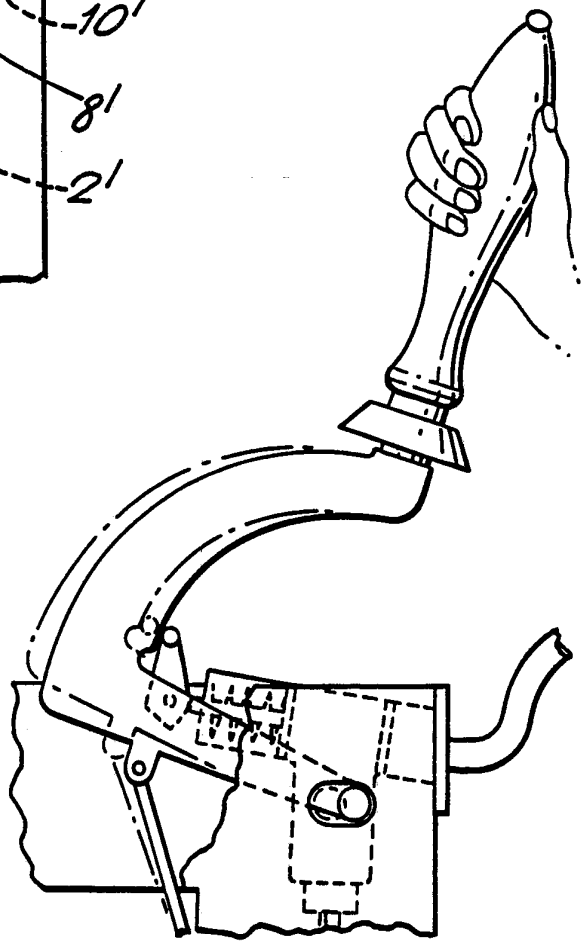


FIG. 5.

INTERNATIONAL SEARCH REPORT

PCT/GB 91/02238

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 B67D1/02; B67D1/14

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	B67D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category[10]	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X	US,A,4 493 443 (BAILEY) 15 January 1985	1-3,10, 11
Y	see figures 1,2	6
Y	EP,A,0 246 052 (CADBURY SCHWEPPES LIMITED) 19 November 1987 see page 20; figures 7,8	6
X	GB,A,2 230 840 (ALUMASC LIMITED) 31 October 1990	1,2,6, 10,11
Y	see page 3 - page 4; figures 1,2	9
Y	GB,A,1 223 832 (MITCHELLS AND BUTLERS (MIDLANDS) LIMITED) 3 March 1971 see page 2, line 6 - line 57; figure 1	9
X	GB,A,2 225 840 (IMI CORNELIUS (UK) LIMITED) 13 June 1990 see abstract; figure 1	1

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* Special categories of cited documents :[10]

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
13 MARCH 1992	26.03.92
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	MARTINEZ NAVAR

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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	GB,A,2 164 921 (PORTER-LANCASTRIAN LIMITED (UNITED KINGDOM)) 3 April 1986 see abstract; figure 1 ---	1

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 9102238 SA 54331

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 13/03/92
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4493443	15-01-85	None	
EP-A-0246052	19-11-87	AU-A- 7299187	26-11-87
GB-A-2230840	31-10-90	None	
GB-A-1223832	03-03-71	None	
GB-A-2225840	13-06-90	None	
GB-A-2164921	03-04-86	None	