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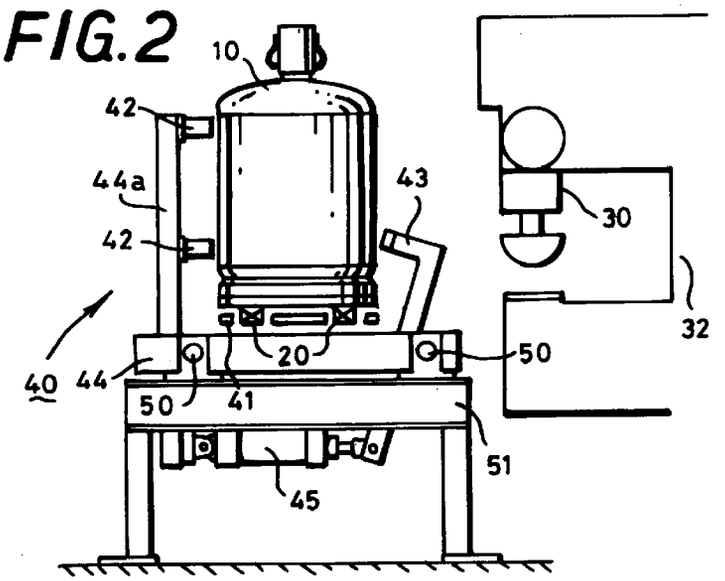
(54) Device for automatically marking gas cylinders

(57) The invention relates to a device for automatically marking gas cylinders (10) travelling along on a conveyor (20), comprising at least one marking stamp (30, 31) placed at a fixed station on one side of the conveyor, able to stamp each gas cylinder at a given location when this cylinder is offered up to face the marking stamp, and means for immobilizing each gas cylinder facing the marking stamp.

FIG.2



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Description

The present invention relates to a device for automatically marking gas cylinders of the "butane" or "propane" type.

Legislation governing the packaging of hazardous substances requires the body of gas cylinders of this type to be marked with various inscriptions such as, for example, an inscription relating to the extremely inflammable nature of the product contained in the cylinders and/or the note "keep out of reach of children", and/or also the note "do not smoke" or "keep the container in a well-ventilated location".

The marking of these cylinders generally has to be done at the time when the cylinders are filled with gas. For the marking operation to fit into an automatic gas-cylinder filling process, this marking operation needs to be done automatically while the gas cylinders are travelling along one behind another on a conveyor taking them to various processing stations such as the filling station for example.

Therefore the present invention proposes an automatic device for marking gas cylinders travelling along on a conveyor.

To this end the device for automatically marking gas cylinders travelling along on a conveyor, comprising at least one marking stamp placed at a fixed station on one side of the conveyor, able to stamp each gas cylinder at a given location when this cylinder is offered up to face the marking stamp, and means for immobilizing each gas cylinder facing the marking stamp.

According to a particularly advantageous feature, the device in accordance with the invention comprises several marking stamps spaced apart and the means for immobilizing each gas cylinder are capable of transporting each immobilized gas cylinder to face each marking stamp.

The invention will now be described by way of example in more detail with reference to the attached drawings, wherein

Figure 1 is a diagrammatic view from above of one embodiment of the marking device in accordance with the invention;

Figure 2 is a diagrammatic side view of the marking device of Figure 1, in the position for receiving a gas cylinder;

Figure 3 is a diagrammatic view from above of the marking device of Figure 1 in a position for clamping the gas cylinder;

Figure 4 is a diagrammatic side view of the marking device represented in Figure 3;

Figure 5 is a diagrammatic view from above of the marking device of Figure 1 in the course of transporting the immobilized gas cylinder from one marking stamp to another; and

Figure 6 is a view from above of the marking device of Figure 1 as the marked gas cylinder is released.

Shown in the Figures is a device for automatically marking gas cylinders 10. These gas cylinders 10 are positioned vertically, and their base rests on a conveyor 20, for example of the conveyer belt line type, one behind another. This conveyor 20 is capable of bringing the gas cylinders 10 to various processing stations.

The device for automatic marking according to the invention includes several marking stamps 30 and 31 (see Figures 2-5). In Figure 3 two marking stamps 30 and 31 are shown, positioned at a fixed station 32 on one side of the conveyor 20. As may be seen more specifically in Figure 3, these marking stamps 30 and 31 are spaced apart along the conveyor 20. The marking stamps 30 and 31 are mounted so they can rotate around a common axis positioned at the fixed station 32 on one side of the conveyor 20. In this typical case they operate simultaneously.

Furthermore, the marking device includes means for immobilizing each gas cylinder 10 offered up to face the first marking stamp 30 in the direction of travel of the gas cylinders, the immobilizing means being capable of transporting each gas cylinder 10 thus immobilized as far as the other marking stamp 31.

Of course, it may be envisaged that the marking device includes a number of stamps greater than two, in which case the immobilizing and transport means would make it possible to shift each gas cylinder from one marking stamp to another.

More specifically, according to the embodiment represented, the immobilizing and transport means comprise a mobile truck 40 which can move between two successive marking stamps 30 and 31 placed spaced apart along the conveyor 20 and in the direction of the conveyor 20. This mobile truck 40 includes a horizontal structure 44 positioned beneath the conveyor 20 and mounted with translation via linear ball bearings or alternatively self-lubricating bushings along guides 50, on a stationary bed 51. The translational displacement of the horizontal structure 44 is provided by a ram, not represented here, fixed to the stationary bed 51.

It should be emphasized that the end-of-travel positions (corresponding to the positions of the marking stamps) of the mobile truck 40 (the retracted and extended position of the ram) are provided by hydraulic shock absorbers associated with mechanical buffers (not represented here) positioned adjustably on the stationary bed 51.

The mobile truck 40 includes means for lifting each gas cylinder 10 above the conveyor lines of the conveyor 20 and means for clamping the lifted gas cylinder.

More specifically, according to the embodiment represented in the Figures, the lifting means include a lifting plate 41 (see Figures 2 and 4) capable of supporting each gas cylinder 10 arriving at the stamping station and of shifting vertically with respect to the horizontal structure 44 of the mobile truck 40 in order to position each gas cylinder above the conveying lines of the conveyor 20.

It should be emphasized that the lifting plate 41 is intended to adopt two positions, at first a position for receiving each gas cylinder 10 in which position it is beneath the conveying lines of the conveyor 20 (see Figure 2), and secondly a lifting position (see Figure 4) in which it is above the conveying lines of the conveyor 20.

The clamping means of the marking device comprise on the one hand a receiving cradle 42 secured to a vertical upright 44a fixed to the horizontal structure 44 and positioned to the side of the gas cylinder 10 in position on the lifting plate 41 and, on the other hand, a lever 43 mounted with pivoting on the horizontal structure 44 via a ram 45, between a position for receiving each gas cylinder 10 on the lifting plate 41 (see Figure 2) in which position the lever 43 is slightly vertically inclined with respect to the structure, and a clamping position (see Figure 4) in which the lever 43 comes to bear against the body of the gas cylinder 10 in order to push it into the receiving cradle 42. In this clamped position, the gas cylinder 10 is clamped tightly between the cradle 42 and the lever 43.

It should be emphasized that the pivoting movement of the lever 43 is coordinated with the lifting movement of the lifting plate 41 so that when each gas cylinder 10 arrives on the marking device, the lifting plate 41 lifts then the lever 43 swings across onto the cylinder in order to grip it tightly between the lever 43 and the receiving cradle 42.

Moreover, the marking device includes a holding means 60, positioned in a fixed station beside the conveyor and capable of holding in standby each gas cylinder 10 on the conveyor which arrives at the stamping station during the time in which the previous gas cylinder is being stamped. This holding means 60 includes a retractable arm positioned perpendicularly to the direction of travel of the gas cylinders 10 and able to adopt an extended position in which it bears against each gas cylinder, and a retracted position clearing the path for the gas cylinder 10.

The marking device of the present invention as shown in Figures 1 to 6 operates as follows.

The mobile truck 40 is positioned in standby facing the first marking stamp 30. The retractable holding arm of the holding means 60 retracts to allow a gas cylinder 10 travelling along the conveyor 20 to pass, then after the gas cylinder 10 has passed comes back to bear on the next gas cylinder. The gas cylinder 10 freed of the holding means 60 is brought by the conveyor 20 onto the lifting plate 41 of the marking device.

After receiving the gas cylinder 10, the lifting plate 41 lifts to position the gas cylinder 10 above the conveying lines of the conveyor 20. The plate lifting through the conveying lines causes the lever 43 to close on the gas cylinder 10 thus lifted, so that it pushes the gas cylinder 10 onto the lifting plate 41 in order to block it against the receiving cradle 42. In this position, the gas cylinder 10 is immobilized facing the first marking stamp 30. The marking stamp 30 then carries out its stamping operation on the body of the gas cylinder 10.

Owing to the fact that the marking stamps 30, 31 operate simultaneously, when the first marking stamp 30 carries out its stamping operation on the body of the immobilized gas cylinder 10, the second marking stamp 31 carries out its stamping operation in thin air.

After the marking stamp 30 has carried out its stamping operation on the body of the gas cylinder 10, the mobile truck 40 is translated via the ram (not shown) on the stationary bed 51 so as to bring the gas cylinder 10 thus immobilized to face the second marking stamp 31. The marking stamp 31 then carries out its stamping operation on the body of the gas cylinder 10, the first marking stamp in turn carrying out its stamping operation in thin air.

It has to be emphasized that the complete absence of movement of the gas cylinder 10 with respect to the horizontal structure 44 as it is transferred makes it possible to guarantee good positioning of the second marking with respect to the first and, more generally, of one marking with respect to the other.

When the second marking has been carried out, the lever 43 moves aside to resume its initial position. The lifting plate is lowered back into its position beneath the conveying lines in order to release the stamped gas cylinder 10 near the second stamp. The stamped gas cylinder 10 is then placed back on the conveying lines of the conveyor 20 to be taken to the next station.

The empty truck returns to its initial position near the first stamp in order to collect another gas cylinder.

The invention is not limited to the embodiment described and represented, but those skilled in the art will be able to make any modifications thereto in accordance with its spirit.

Claims

1. Device for automatically marking gas cylinders (10) travelling along on a conveyor (20), comprising at least one marking stamp (30, 31) placed at a fixed station on one side of the conveyor (20), able to stamp each gas cylinder (10) at a given location when this cylinder is offered up to face the marking stamp (30, 31), and means for immobilizing each gas cylinder (10) facing the marking stamp (30, 31).

2. Device according to claim 1, characterized in that the means for immobilizing each gas cylinder (10) comprise lifting means (41) intended to lift each gas cylinder (10) up above the conveyor (20) and clamping means (42, 43) intended to clamp each lifted gas cylinder (10).

3. Device according to claim 1 or 2, characterized in that it comprises several marking stamps (30, 31) spaced apart and in that the means for immobilizing each gas cylinder (10) are capable of transporting

each immobilized gas cylinder (10) to face each marking stamp (30, 31).

4. Device according to claim 3, characterized in that the immobilizing and transporting means comprise a mobile truck (40) which can move between two successive marking stamps (30, 31) placed in the path of the conveyor (20).

5. Device according to any one of the claims 2-4, characterized in that the clamping means comprise at least one receiving cradle (42) placed laterally with respect to the gas cylinder (10) and at least one lever (43) capable of coming to bear against each gas cylinder in order to clamp it against the receiving cradle (42).

6. Device according to any one of the claims 2-5, characterized in that the lifting means comprise a lifting plate (41) capable of being positioned under each gas cylinder (10) and of positioning it above the conveyor (20).

7. Device according to claim 5, characterized in that the lever (43) is mounted with pivoting between a position for receiving the gas cylinder (10) on the lifting plate (41) and a position for clamping the gas cylinder (10) onto the plate (41).

8. Device according to claim 7, characterized in that the lever (43) can be actuated using a ram (45).

9. Device according to any one of the claims 1-8, characterized in that it includes a holding means (60) positioned on one side of the conveyor (20) capable of holding each gas cylinder (10) on standby on the conveyor (20) during the time that the preceding gas cylinder is being stamped.

10. Device according to any one of the claims 4-9, characterized in that the truck includes a horizontal structure (44) mounted with translation on the path of the conveyor (20) and in that it includes a ram capable of shifting the horizontal structure (44) in order to position it facing each marking stamp (30, 31).

11. Device according to claim 10, characterized in that the lifting means (41) and the clamping means (42, 43) are mounted as an integral part of the horizontal structure (44).

12. Device according to any one of the claims 2-11, characterized in that the marking stamps (30, 31) are mounted with pivoting on a structure (32) positioned on one side of the conveyor and operate simultaneously.

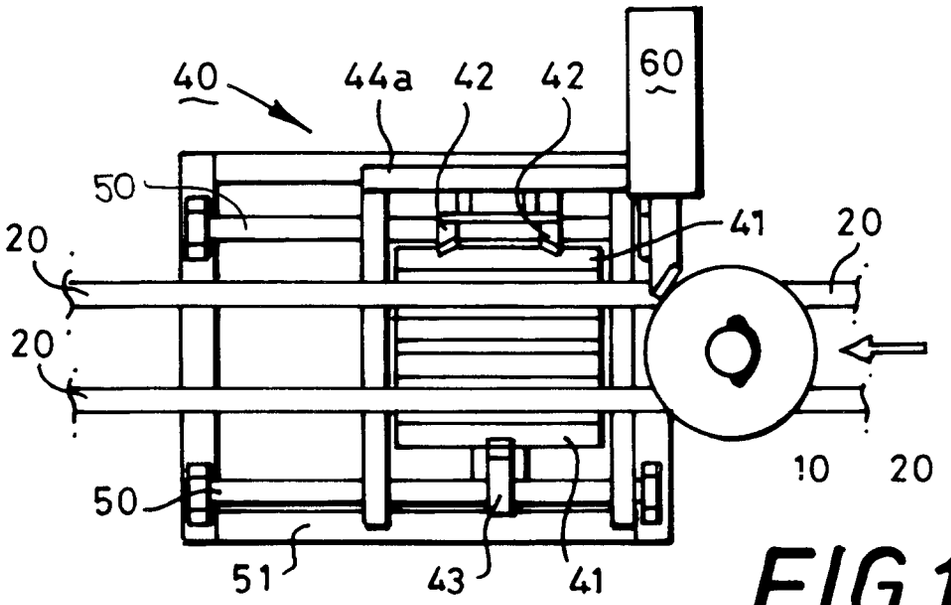
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FIG.1

FIG.2

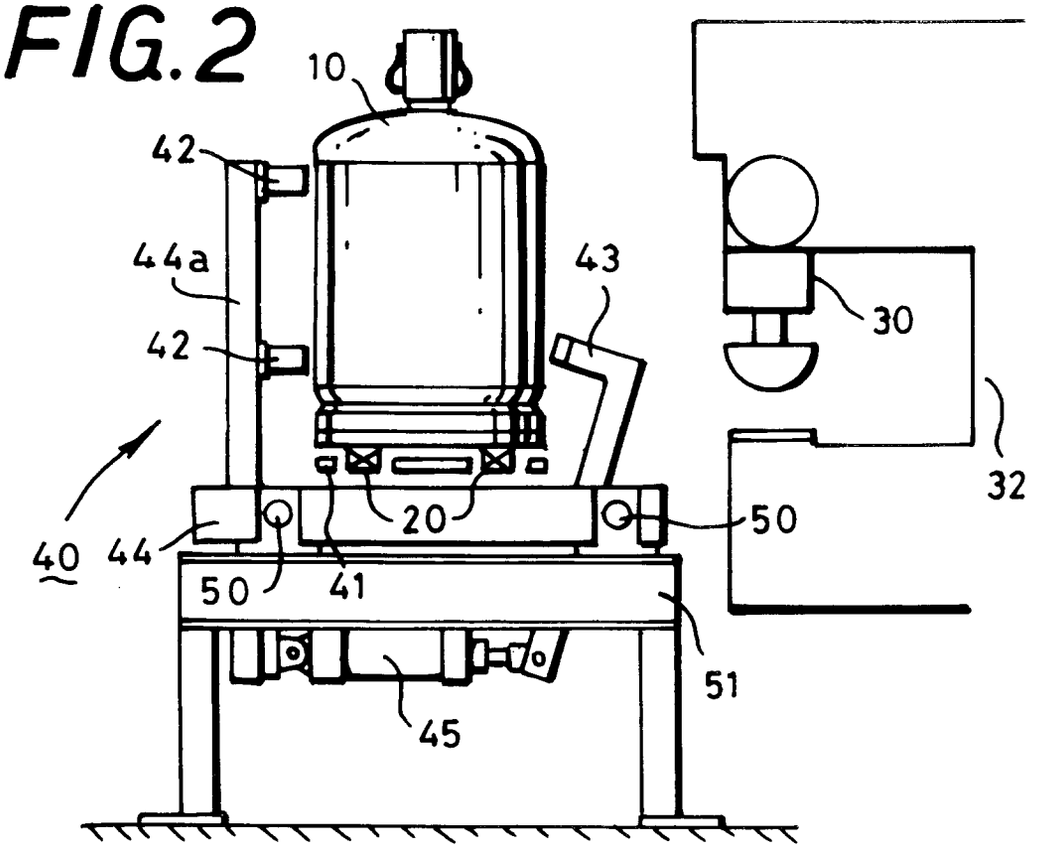
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FIG.3

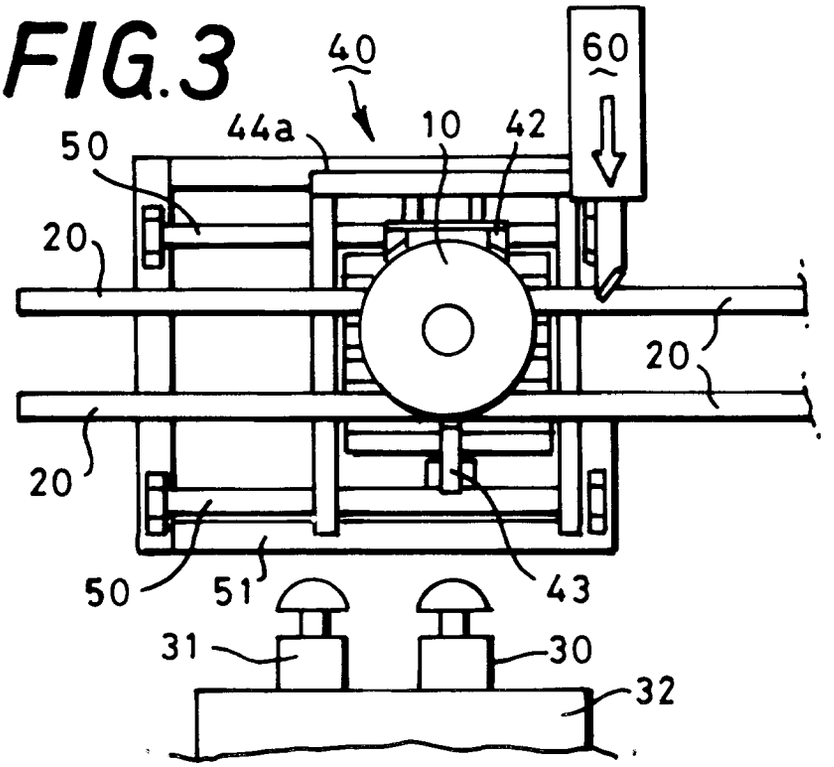
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FIG.4

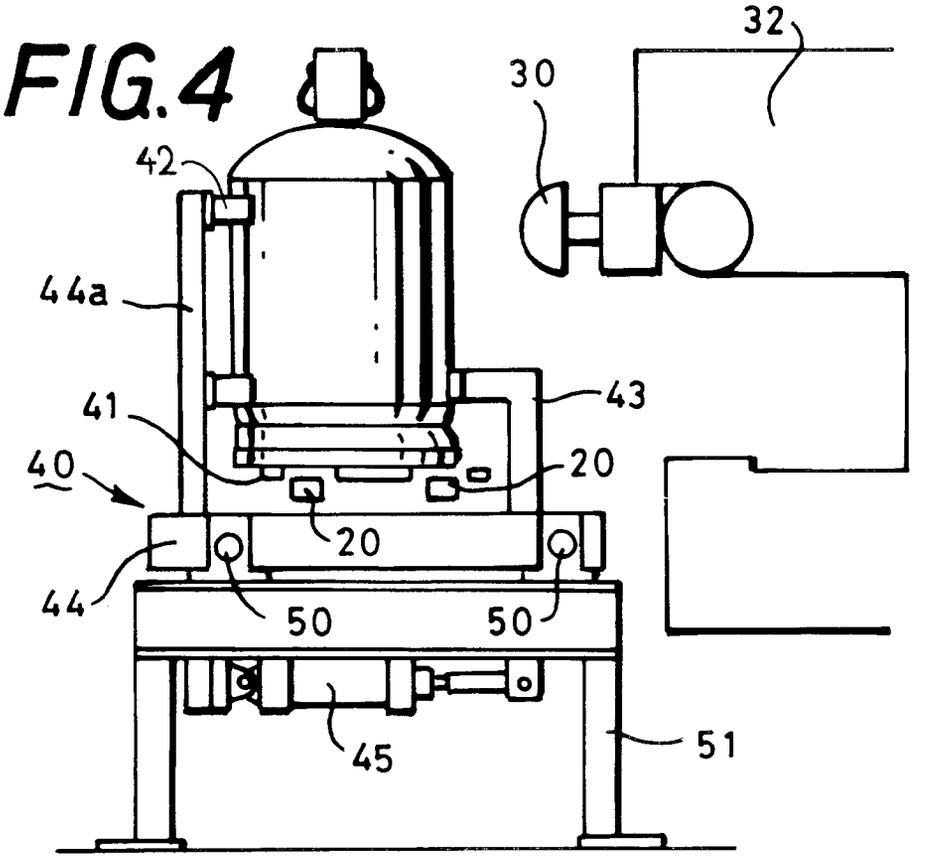
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FIG. 5

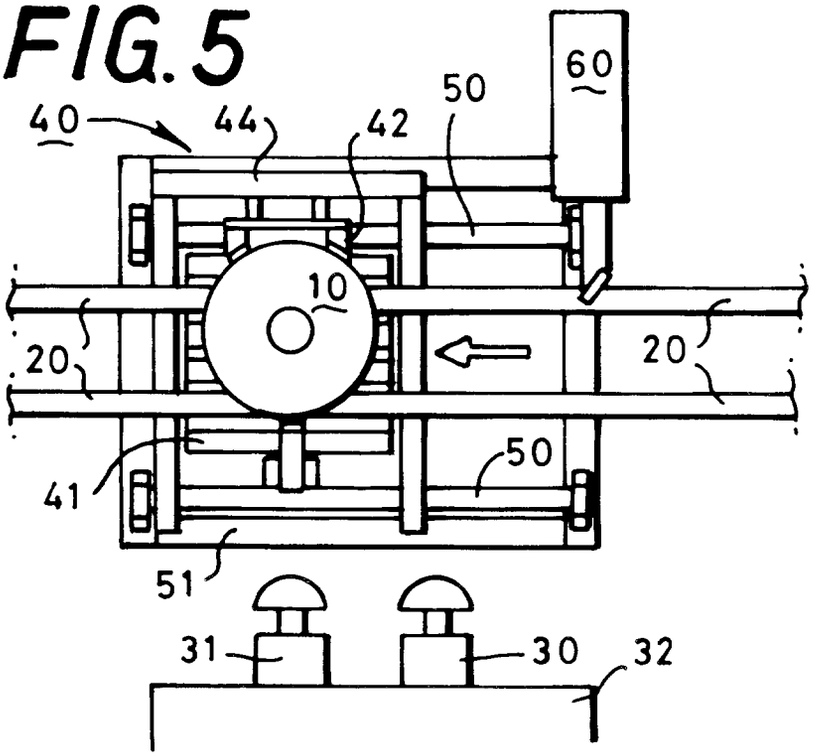
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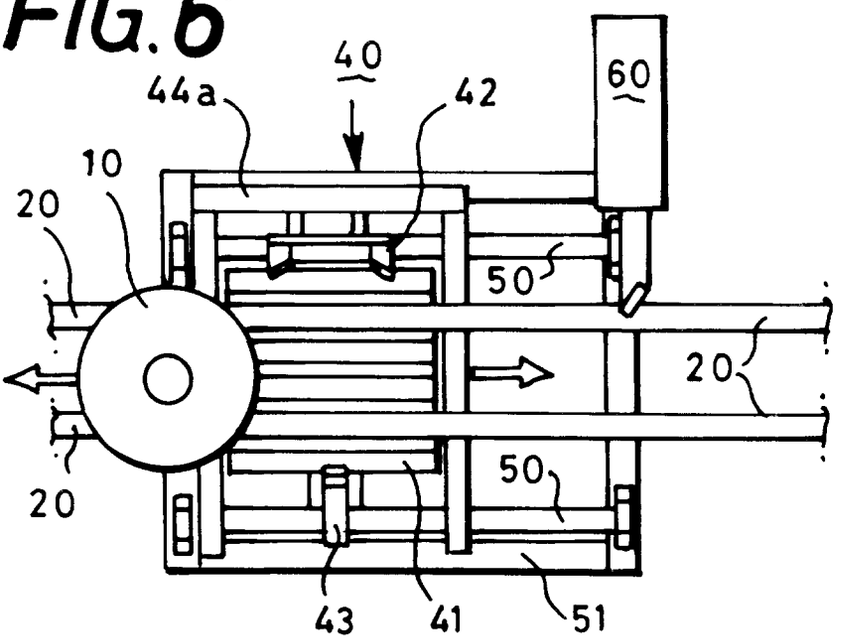
FIG. 6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EUROPEAN SEARCH REPORT

Application Number
EP 96 20 1331

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y A	FR-A-2 686 143 (BUTAGAZ) * claims; figures *	1,2 3-11	F17C13/00
Y	FR-A-2 563 808 (SOCIETE POUR L'UTILISATION RATIONNELLE DES GAZ) * claims; figures *	1,2	
A	EP-A-0 590 466 (SCHNEIDER)	1-11	
A	DATABASE WPI Section PQ, Week 9536 Derwent Publications Ltd., London, GB; Class P75, AN 95-273549 XP002010598 & JP-A-07 174 298 (AKEMITSU SANGYO KK) , 11 July 1995 * abstract *	1-11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) F17C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 August 1996	Meertens, J

CATEGORY OF CITED DOCUMENTS

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