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(54) **Working table top for a laundry washing machine of the top-loading type.**

(57) A laundry washing machine of the top-loading type comprising a drum mounted for rotation in a tub provided with a loading opening 12 connected to the working table top of the machine by a bellows-type sealing sleeve 18, and further comprising water supply means 21 disposed in a chamber 20 of the working table top, and a detergent and additives distributor 14 located below a cover plate 13 of the machine.

The water supply means comprises a pivotable nozzle 21 for selectively directing water into respective compartments 15 of the detergent distributor 14 through connecting passages (30) of a configuration resulting in the production of a venturi effect.

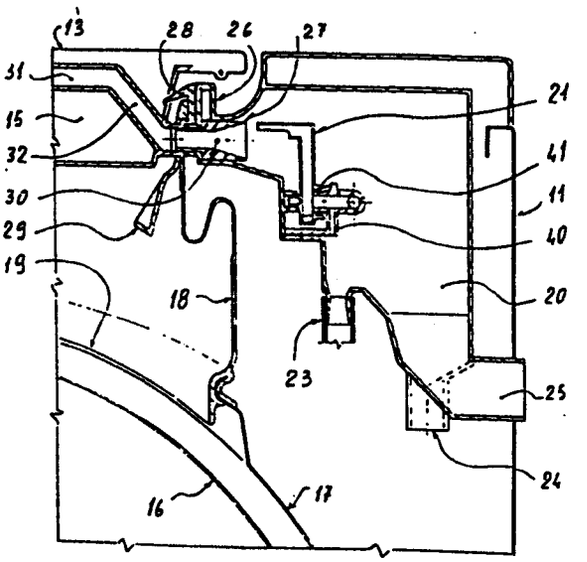

fig.2

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Description

The present invention relates to a laundry washing machine of the top-loading type and is specifically directed to a working table top forming the upper closure of the machine.

Laundry washing machines of the top-loading type are generally provided with a detergent and additives distributor supported in an upper portion of the machine and having a lid which is separate from the cover plate of the machine as a whole. This solution appears technically disadvantageous and uneconomical in that it requires a great number of separate parts and a corresponding number of operations for its assembly. In addition, this type of laundry washing machines is by its nature of a very compact construction, particularly in the case of models of reduced height and width. The available space in laundry washing machines of this type is thus very restricted, in comparison to which a conventional detergent distributor is undesirably bulky.

Known from French Patent 2,455,113 is a laundry washing machine provided with a composite cover formed of an inner cover plate provided with receptacles for containing detergents, and an outer cover plate. The cover as a whole is hinged on the housing of the machine, while the outer cover plate is hinged on the inner cover plate. The withdrawal of the detergents from the receptacles of the inner cover plate is accomplished by means of a ring of water produced by the rotation of the drum containing the laundry. Part of this water enters the receptacles through suitable openings in the inner cover plate and is discharged towards the drum and the tub through a siphon formed in each receptacle.

This solution has serious shortcomings in that the selective withdrawal of detergents from the individual receptacles requires the employ of a program control unit which has to accurately determine the timing, the speed and the

sense of rotation of the drum for producing a ring of water of the proper configuration whenever needed during each phase of the washing cycle. This means that the drum has to be rotated also during the water and detergent supply phases for producing the required ring of water. This again requires an overdimensioned electric motor with the resultant increase in energy consumption. The water ring system finally does not ensure complete withdrawal of the detergents, which may result in the receptacles and their outlets becoming clogged by residual detergents, particularly when granular detergents are used.

In another known solution described in European Patent No. 0083532, the detergent distributor comprises two universal receptacles removably mounted immediately below a closure cover of the machine, from which the withdrawal of the detergents is accomplished by means of tangential water jets with respect to the circular sidewalls of the receptacles. In addition the detergent distributor comprises two further receptacles fixedly mounted in the housing and supplied with water by a further jet, respectively, and by a flow of water resulting from the confluence of the two jets provided for the circular receptacles adjacent the cover. It is evident that this solution, which may be referred to as a "mixed system" including receptacles associated with the cover and receptacles associated with the housing, is of rather bulky and complicated construction to which is added the difficulty of controlling, individually and in combination, the various water jets for accomplishing the selective withdrawal of the detergents. This solution, finally, is questionable from the technical, economical and ecological viewpoints by reason of the absence or the insufficiency of means for limiting losses of water and detergents and for preventing the escape of vapours.

It is therefore an object of the invention to p ovide a laundry washing machine of the top-loading type provided with a working table top comprising a detergents and

additives distributor; this distributor should have the smallest possible dimensions, ensure the highest possible efficiency with regard to the withdrawal of the substances contained in the individual receptacles, and should satisfy the highest requirements with regard to the recovery of detergents, the control of water losses and the condensation of vapours.

These objects are attained by a working table top for a laundry washing machine of the top-loading type comprising a rotatable drum mounted within a tub having a loading openings connected to the working table top by a bellows-type sealing sleeve, said working table top being provided with a distributor for detergents and additives, wherein said working table top includes a fixed chamber containing water supply means and connected to conduit means for the recovery of detergents and the reduction of water losses, a conduit member being mounted in said chamber to extend through said bellows-type sealing sleeve for directing water towards said detergent distributor supported by a cover hinged to said working table top.

The characteristics of the invention will become more clearly evident from the following description, given by way of example with reference to the accompanying drawings, wherein:

fig. 1 shows a perspective view of a laundry washing machine according to the invention,

figs. 2 and 3 show a sectional top plan view respectively and a sectional lateral view of a detail of the machine of fig. 1, and

fig. 4 shows a diagrammatic longitudinal section of a modified embodiment of the invention.

As shown in fig. 1, a laundry washing machine of the top-loading type according to the invention comprises a housing 11 provided with a laundry loading opening 12 formed in the top wall of the housing and adapted to be closed by a cover 13 hinged to the working table top. Provided at

the interior wall surface of cover 13 and preferably integrally connected thereto is a container-distributor 14 for liquid and/or granular detergents and additives comprising a plurality of compartments 15. The laundry washing machine is in the usual manner provided with a drum 16 mounted for rotation about a horizontal axis within a tub 17, the latter being connected to the working table top by a bellows-type sealing sleeve 18 peripherally sorrounding a loading opening 19 of tub 17 (fig. 2).

At the rear of the working table top there is provided a chamber 20 containing a water supply nozzle 21 having a pipe socket 22 for connection to the water supply of the machine (fig. 3). Nozzle 21 is mounted for pivotal movement about a horizontal axis under the control of a program control unit (not shown) of the machine, and is provided with an internal seal 41 for maintaining constant the water pressure within the nozzle.

A conduit 23 connects chamber 20 to the conventional filtering and sichrage pump unit (not shown) of the machine. Conduit 23 is supplied with water from a orifice 40 connected to nozzle 21 for the purpose of recovering detergents which would otherwise be lost from the filtering and discharge pump unit. A further conduit 24 connects chamber 20 to tub 17 for the supply thereto of any water possibly escaping from the water supply system due to the presence of a free jet arrangement to be described below. Chamber 20 is finally provided with a conventional overflow passage 25.

Fixedly mounted at the rim 26 delimiting the loading opening in the working table top in front of nozzle 21 is a horizontal conduit member 27 extending through bellows-type sealing sleeve 18 and formed with a protective lip 28 and optionally with a baffle member 29. Conduit member 27 contains a number of passages 30 corresponding to the compartments 15 of container-distributor 14 (fig. 1), each passage 30 having an enlarged inlet opening and a

convergent inlet end portion for receiving the water jet produced by nozzle 21 with the highest possible hydraulic efficiency. The free jet arrangement between nozzle 21 and passages 30 of conduit member 27 serves as a supply circuit separator as demanded by safety regulations for the water supply of laundry washing machines.

In the closed position of cover 13 as shown in figs 2 and 3, the outlet openings of passages 30 are directly aligned and in contact with the inlet openings of corresponding passages 31 for directing the water to respective compartments 15 of detergent distributor 14.

Passages 31 each have an inlet end portion 32 extending in an ascending direction (fig. 2) and being of divergent configuration (fig. 3) adapted to produce a venturi effect for converting the flow velocity of the water to hydraulic pressure and for ensuring the correct water supply to compartments 15 of distributor 14. In addition, passages 31 are effective to recover vapours produced during the laundering operation and to direct them into chamber 20, in which they are condensed for return to tub 17 through conduit 24.

The invention may of course be modified within the range of the dexcribed structural and functional characteristics. In a modified embodiment shown in fig. 4, for instance, nozzle 21 is mounted for pivotal movement about a vertical axis and provided at its top with an adjustment screw 35 for the adjustment of the mechanical play in the vertical direction, said adjustment screw being accessible after removing a cover plate 36 releasably secured to the working table top. On the other hand, compartments 15 are each provided with a hinged hopper 37 for facilitating the introduction thereinto of detergents, and a micro-siphon 38 for the discharge of water, but not of viscous liquid detergents, into the tub therebelow. The operation of micro-siphon 38 is described in the precedent Italian Utility Model Application Nr. 34062/B/ 84 filed on Oct. 12, 1984

by the present applicant.

The invention thus provides for improved utilization of the available internal space of a laundry washing machine and permits the replenishment of detergents and additives with the cover in its open position directly above the loading opening of the tub while reliably complying with all safety regulations.

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EP 2977-50

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I t a l y

Working Table Top for a Laundry Washing Machine of the Top-Loading Type

Patent Claims

1. A working table top for a laundry washing machine of the top-loading type comprising a rotatable drum mounted within a tub having a loading opening connected to the working table top by a bellows-type sealing sleeve, said working table top being provided with a distributor for detergents and additives, characterized in that said working table top includes a fixed chamber (20) containing water supply means (21) and connected to conduit means (23, 24, 25) for the recovery of detergents and the reduction of water losses, a conduit member (27) being mounted in said chamber (20) to extend through said bellows-type sealing sleeve (18) for directing the water towards said detergent distributor (14) supported by a cover (13) hinged to said working table top.

2. A working table top according to claim 1, characterized in that said conduit member (27) comprises a plurality of passages (30) each having an enlarged inlet opening and at least an inlet end portion of convergent cross-section.

3. A working table top according to claim 1, characterized in that said detergent distributor (14) includes a pluraility of compartments (15) each provided with passages (31, 32) for the supply of water, said passages having an inlet end portion (32) communicating with the outlet end portion of a corresponding passage (30) of said conduit member (27) and extending in an ascending direction with a divergent configuration so as to form a venturi-type passage in cooperation with said conduit member passage (30).

4. A working table top according to claim 3, characterized in that the zone of communication between the outlet openings of said passages (30) of said conduit member (27) and the inlet openings of said passages (31, 32) is located below an upper sealing lip (28) which may be integrally connected to said bellows-type sealing sleeve (18).

5. A working table top according to claim 3, characterized in that each compartment (15) of said detergent distributor (14) is provided with a hopper (37) hinged to the opening of the respective compartment (15).

6. A working table top according to claim 1, characterized in that said water supply means (21) comprise a rotatable nozzle for selectively supplying water to said passages (30) of said conduit member (27), said nozzle (21) being provided with an auxiliary orifice (40) for supplying water to said detergent recovery conduit (23).

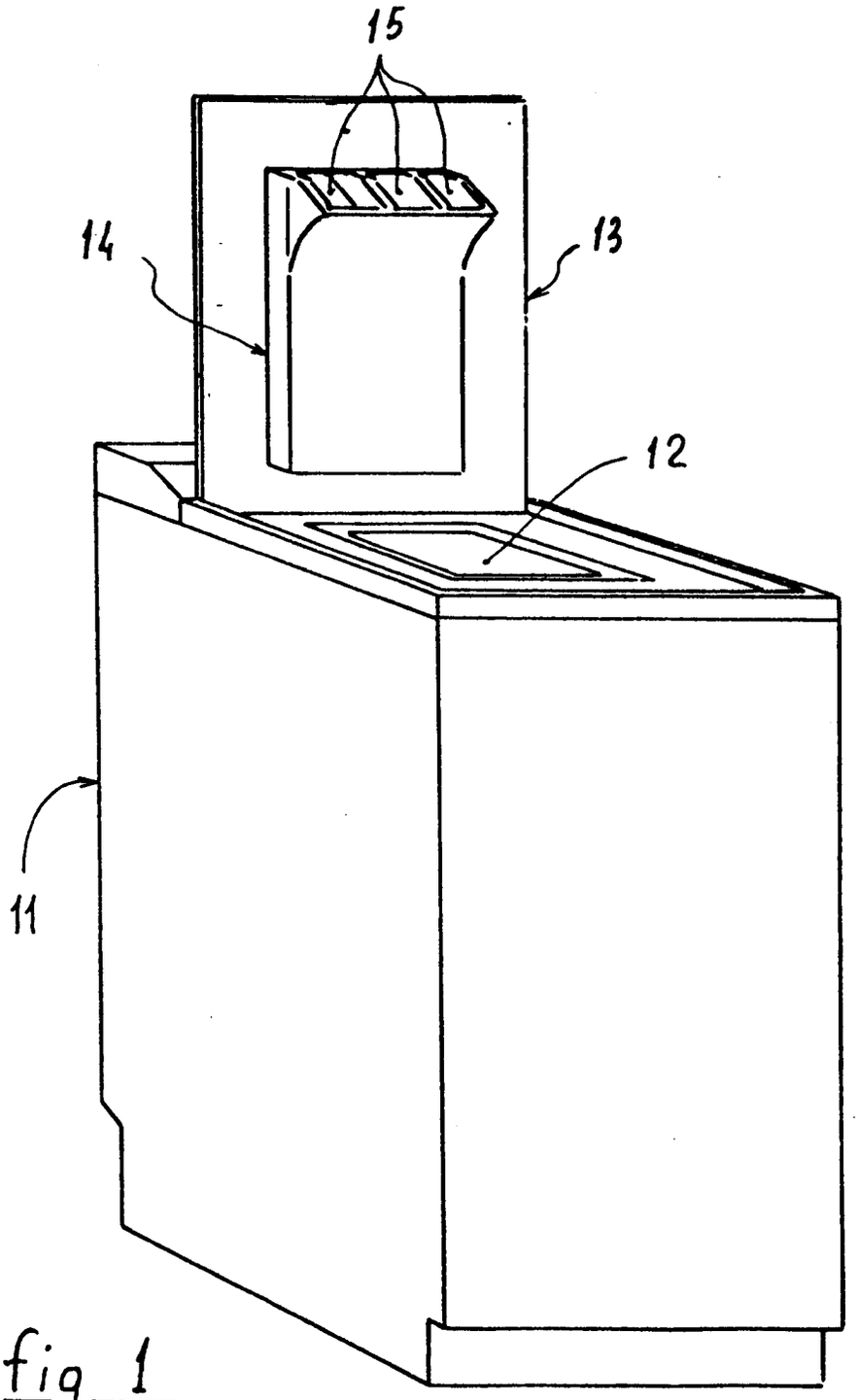

fig 1

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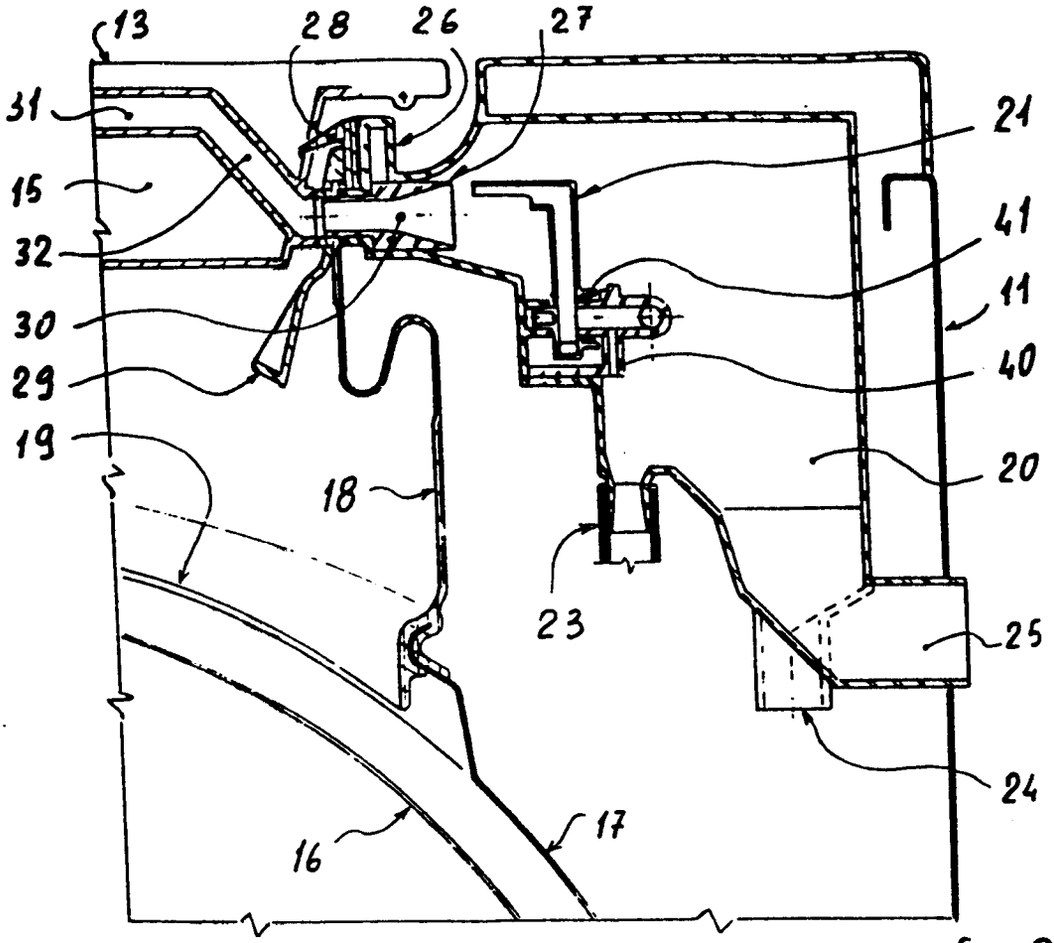

Fig.2

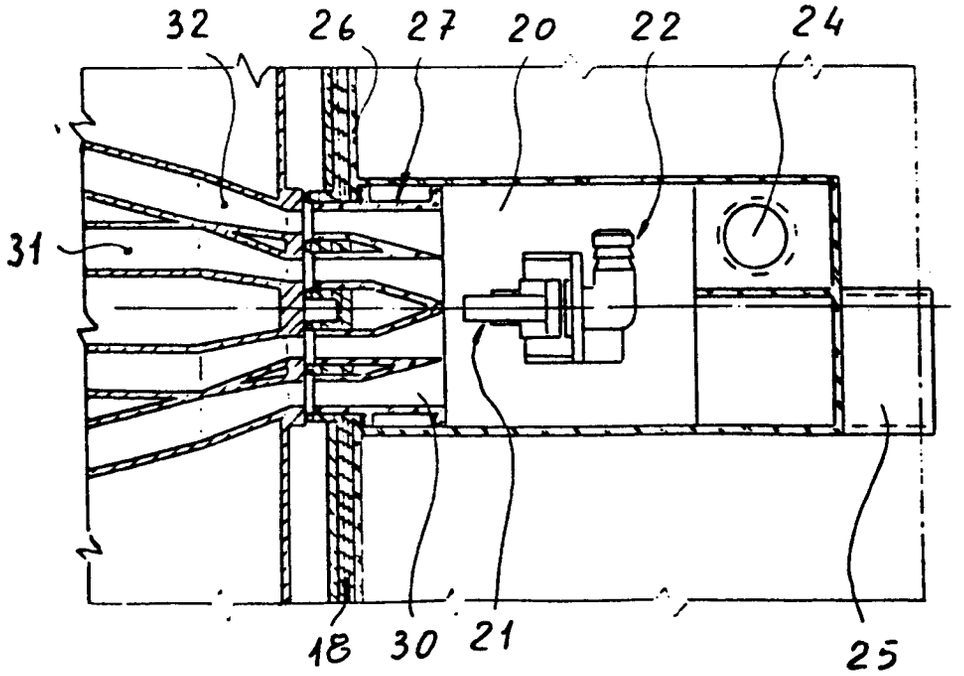

Fig.3

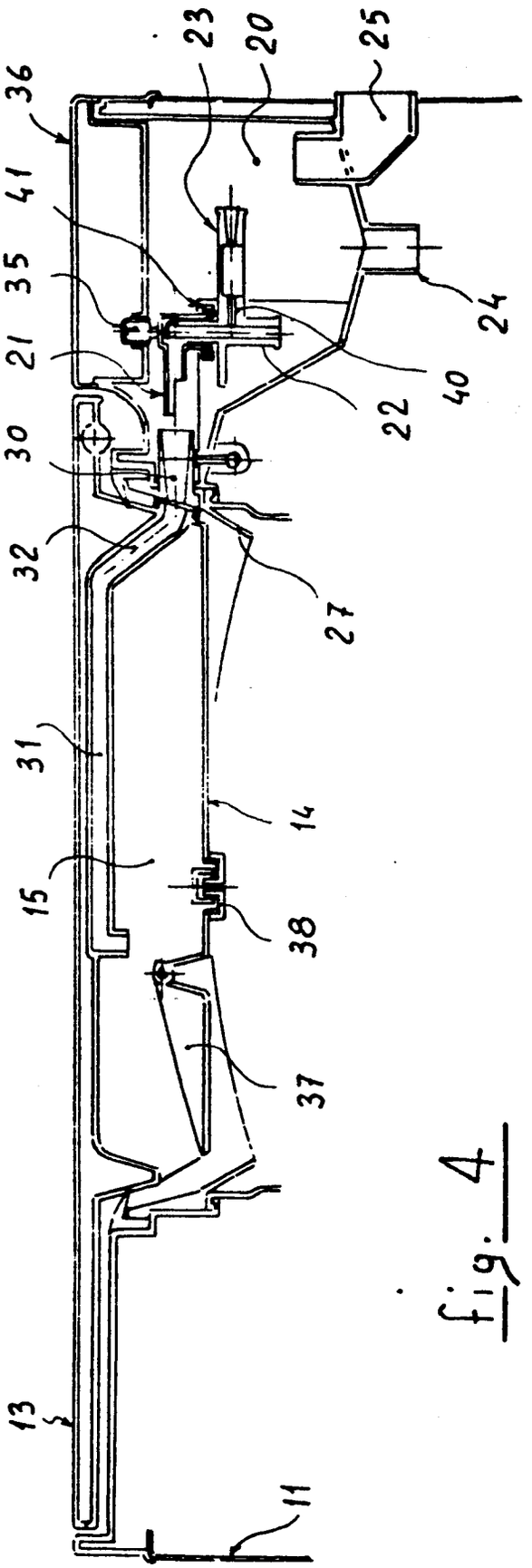

Fig. 4

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Application number

EP 86 11 0320

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EUROPEAN SEARCH REPORT

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.4)
A,D	EP-A-0 083 532 (THOMSON-CSF) * Figures; claims * ---	1-3	D 06 F 39/02 D 06 F 39/08
A	FR-A-2 503 744 (ESSWEIN) * Figures 4,5; claim 1 * ---	1-3	
A	DE-A-2 134 689 (LICENTIA-PATENT) * Figures 1-4; claims * ---	1-3	
A	DE-A-2 115 341 (RIEDEL) * Figure 1; claims 1,2 * -----	3,6	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

D 06 F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	04-11-1986	COURRIER,G.L.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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