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(71) Applicant: **Lombardi, Celso**
dba Programma Igena di Lombardi e Simoncelli S.N.C.
Viale Roma 274/a(IT)
Applicant: **Simoncelli Loris**
dba Programma Igena di Lombardi e Simoncelli S.N.C.
Viale Roma 274/a(IT)

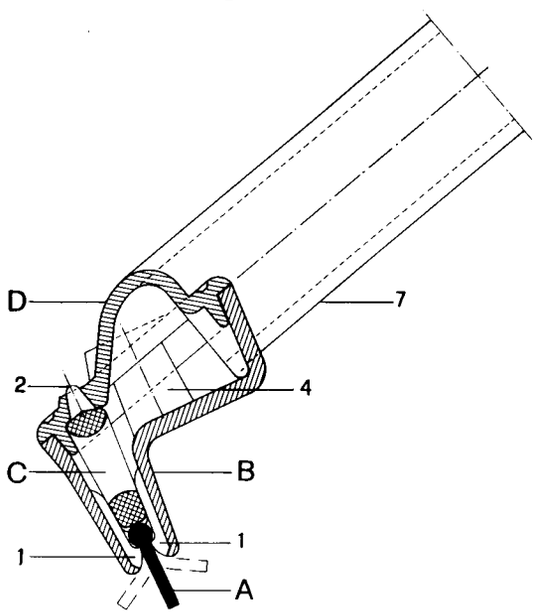
(72) Inventor: **Micali, Aldo**
Via Oreste Regnoli, 41
I-47100 Forli'(IT)

(74) Representative: **Modiano, Guido et al**
c/o Modiano & Associati S.r.l. Via Meravigli, 16
I-20123 Milano (IT)

(54) Device connectable to liquid aspiration units for cleaning flat surfaces.

(57) The device has a tubular handle (7) connectable to a liquid aspiration unit, and a rubber blade (A) which is arranged so as to separate two rows of aspiration intakes which are formed by the internal recesses or ridges 1 of the blade holder (B). The ridges (1) and a blade presser (C) rigidly associate the rubber (A), securing a toroidal portion thereof, when the blade holder (B) and the cover (D), complete with the handle, are joined by means of the screws (6). The remaining planar portion of the rubber blade (A) can thus flex in both directions, assisting, in each instance, the sliding imposed by the operator and closing the intakes located on the side opposite to the rake side of the blade (A), which is the side for collecting the liquid to be aspirated.

fig. 3



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The present invention relates to a device which is connectable to a known liquid aspiration unit for cleaning flat surfaces such as glass panes, ceramic tiles, ceilings, walls, floors etc., by aspirating the washing liquid so that it is collected in an appropriate container of the aspiration unit.

Currently, devices are known which have an aspirating region arranged between two flexible rubber blades, both of which slide on the surface to be cleaned. One of said blades has notches or discontinuities so that the collected liquid can flow toward said aspiration region.

This naturally makes the device active in a single direction of use.

The same is observed in smaller devices having a single rubber blade arranged proximate to the aspiration intakes, which are provided in the body of the unit facing towards the rake side of the blade, i.e. the side which collects the liquid to be removed.

Since all of the known devices remove liquids only if they are moved in a given direction, the operation of the device requires a manual movement which is similar to the use of a broom, i.e. it entails a double advancement and return motion, since it is necessary to return the device to its operating position at the end of every stroke or translation.

The aim of the invention is to overcome the disadvantages encountered in the use of the known devices connectable to aspiration units for cleaning flat surfaces.

Within the above-mentioned aim, an object of the present invention is to reduce or to halve the work time, the effort of the operator and the power required for the operation of the aspiration unit.

This aim and object, as well as other objects of the invention which will become apparent hereinafter, are achieved by a device as defined in the appended claims.

The present invention provides a device which is active in two opposite directions of motion by virtue of a particularly effective and original solution which consists in providing, in the body of the device, two parallel rows of aspiration openings or intakes separated by a known rubber blade the elastic flexing whereof, assisting in both directions the movement of the accessory on the surface to be cleaned. The blade causes, each time, the temporary closure of one row of intakes, whereby to allow aspiration only through the opposite row, which is on the rake side of the blade and above the region for collecting the liquid to be removed.

On the basis of this new inventive concept, there may be many solutions, diversified according to the requirements of production, use and maintenance.

Therefore, the two preferred embodiments, described hereinafter with the aid of the accompanying drawings, are exclusively exemplifying and non-limitative, since they demonstrate the feasibility and functionality of the invention without excluding further possible variations within the scope of the same inventive concept.

The accompanying explanatory drawings comprise:

figure 1, which is an exploded perspective view of the device according to a first embodiment of the invention;

figures 2 is a perspective view of the device of figure 1;

figure 3 is a transverse sectional view of the device of figure 1 in operating conditions thereof;

figures 4 is a partially sectional top view of the device according to a second embodiment of the invention, and

figure 5 is a transverse sectional view, taken along the plane X-X of the device of figure 4, illustrating the operating conditions thereof.

From the accompanying drawings, it can be seen that the device according to the invention, similarly to other accessories for vacuum cleaners and liquid aspiration units, is shaped so as to define a chamber which is suitable for conveying toward the tubular handle, connected to the unit, all of the flows of material arriving from the aspiration intakes which are arranged, on the two sides of the rubber blade, along the entire operating front of the device.

With reference to the first embodiment illustrated in greater detail in figures 1 and 2, it can be seen that the device is composed of:

- a rubber blade A;
- a blade holder B;
- a blade presser C;
- a cover D complete with a tubular handle to be gripped and inserted in a rigid or flexible intake duct.

The rubber blade A, which is identical to those already mounted in glass-cleaning implements and liquid aspiration machines, has a toroidal enlarged edge for securing in the blade holder element B and, more specifically, between the internal recesses or ridges 1 which delimit, together with said blade, the individual aspiration intakes.

Said recesses or ridges 1 are shaped so as to prevent the downward extraction of the blade A, since said blade, which is inserted longitudinally in the blade holder, is secured thereat by the pressure of the blade presser C which is in turn pushed by the cover D.

Besides the above-mentioned ridges 1 located on the two sides of the lower intake, the blade holder B has, inside it, two conical or cylindrical

raised portions 4 which are preferably provided with a threaded metallic bush and are in any case suitable for receiving the screws 6 which fix the cover D to the blade holder B.

The element C or blade presser, which extends along the entire length of the blade holder B, has:

- a grid-like configuration, along its entire length, for the transverse passage of the aspiration flows arriving from the front intakes;
- a series of conical raised portions 2 which protrude from the upper edge and are intended to be inserted into the corresponding seats 3 of the cover D;
- a series of transverse raised portions provided in the lower edge to cooperate with the ridges 1 of the blade holder B in preventing the longitudinal extraction of the rubber A.

The cover D is advantageously defined monolithically, together with the tubular handle 7 which, as in known vacuum cleaner accessories, acts as short handle and is also complete with couplings for insertion on rigid or flexible tubes which connect the device to the aspiration unit.

Said cover has an edge shaped so as to provide a sealed coupling with the blade holder B. The cover is provided, in an upward position, with the holes 5 for the screws 6 for fixing to the bladeholder and with a series of seats 3. The seats 3 are through holes or blind holes and are in any case shaped for accommodating the conical raised portions 2 of the blade presser C. The blade presser C is maintained in the correct position by the engagement of the raised portions 2 in the seats 3, and by the ridges 1 of the blade holder B, between which it wedges.

The shape imparted to the three elements B, C and D is also a function of manufacturing requirements, since they are advantageously manufactured by injection molding in ABS, PVC or another thermoplastic material.

It should be furthermore noted that the entire device can be easily inspected and cleaned after removing the only two assembly screws 6, whereas in order to longitudinally extract or insert the blade A it is sufficient to loosen said screws without disassembling the entire device.

With reference to the second embodiment of the invention, illustrated in drawing number 3, only the elements E and F are expediently made of thermoplastic material, since their assembly, by means of a pair of screws 14 screwed in the seats 13, allows to rigidly associate the torus of the rubber blade A between the recesses or ridges 11 and 12 of the two elements E and F.

In this case, too, the upper element F is manufactured monolithically together with the tubular handle 15 which, complete with appropriate known couplings, can be inserted in a rigid or flexible duct for connection to the liquid aspiration unit.

As in the preceding version, the loosening of the screws 14 allows the longitudinal extraction and replacement of the blade A, whereas the complete removal of said screws and the consequent separation of the two elements allows the inspection and complete cleaning of the device.

It should be noted that in both of the described embodiments the rubber blade is rigidly associated exclusively in its toroidal region, since its entire planar portion, or most of it, is free to flex, in one direction or the other, depending on the sliding for cleaning and until it rests against one of the two rows of intakes.

The mounting of the rubber blade furthermore allows said blade to protrude, at the two ends of the device, enough to pass so as to lightly contact the raised edges which delimit a glass pane or other surface to be cleaned.

As already mentioned, the device according to the invention, without varying the described general characteristics, is susceptible to modifications or variations, also in relation to the dimensions.

In this regard, the sizes which have a particularly wide cleaning front, are assembled with an adequate number of screws.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Device connectable to liquid aspiration units for cleaning glass panes and other flat surfaces, consisting of a tool which is active in two opposite directions of motion, is characterized in that comprises a blade holder having at least two parallel rows of aspiration openings or intakes which are separated by a rubber blade, of a known type, the elastic yielding whereof, in one direction or the other and according to the sliding imposed by the operator on the surface to be cleaned, determines the closure of one row of intakes and allows aspiration through the other row which is on the rake side of the rubber and consequently above the region for collecting the liquid to be aspirated.

2. Device according to claim 1, characterized in that the rubber blade, which is of a known type and has such dimensions as to protrude at the two ends of the device, is rigidly associated

exclusively in its own toroidal region so that its entire flat portion, or most of it, can flex freely, in one direction or the other, assisting its cleaning movement and until it rests against the row of intakes to be covered.

3. Device according to the preceding claims, characterized in that it can be executed according to the embodiment of figures 1-2-3, which has the two rows of aspiration intakes arranged in a blade holder element B the internal recesses or ridges 1 whereof keep the torus of the rubber blade A centered and prevent its downward extraction despite the pressure from above of the blade presser element C, pushed by the cover D which, coupled to the blade holder B with screws or other equivalent means, delimits above the chamber which is connected to the tubular handle 7 to be connected to the aspiration unit by means of the coupling, in succession, of a possible rigid extension and of a flexible duct.

4. Device according to the preceding claims, characterized in that the blade presser C, which is intended to act on the torus of the rubber A so that it protrudes uniformly from the blade holder B, has a series of openings for the transverse passage of the aspiration flows arriving from the front intakes of the device.

5. Device according to the preceding claims, characterized in that the blade presser C, which is provided, in a downward position, with transverse ridges which cooperate with the ridges 1 of the blade holder so as to act on the torus of the rubber blade A, preventing its longitudinal extraction, is provided, in an upward position, with a series of conical teeth or raised portions 2 to be inserted in the corresponding through or blind seats 3 of the cover D so as to further secure the blade presser which is already wedged between the ridges 1.

6. Device according to claims 1 and 2, characterized in that it can be executed according to the embodiment of figures 4 and 5, which has each of the two rows of aspiration intakes defined in one of the two elements E and F which, joined by screws or other equivalent means, secure the torus of the rubber blade A between the respective ridges 11 and 12 which form said intakes.

7. Device according to claim 6, characterized in that the chamber formed by the two elements E and F is connected to the aspiration unit through the tubular handle 15 of F which is appropriately preset for the coupling of a possible rigid extension or of a flexible duct.

fig. 1

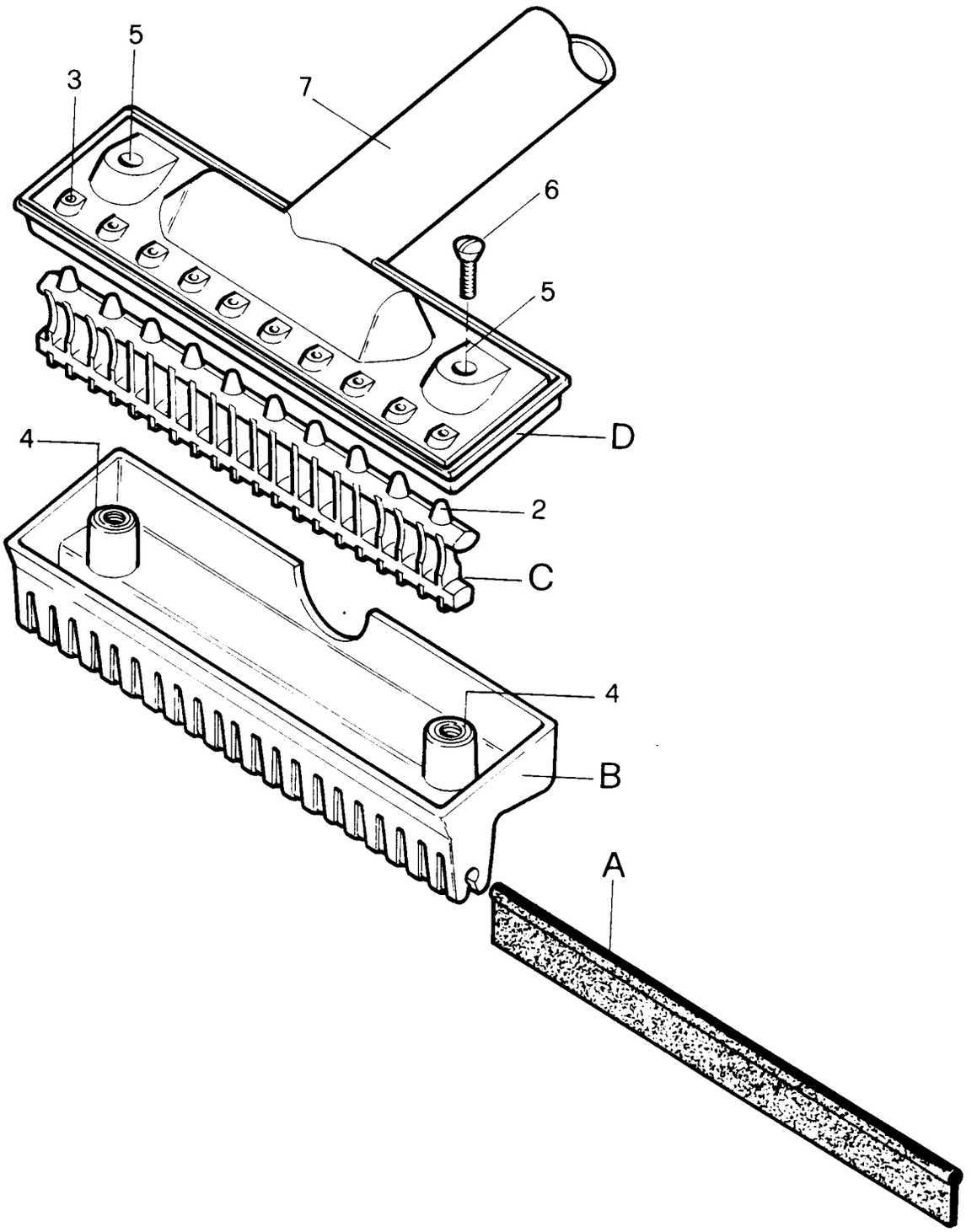


fig. 3

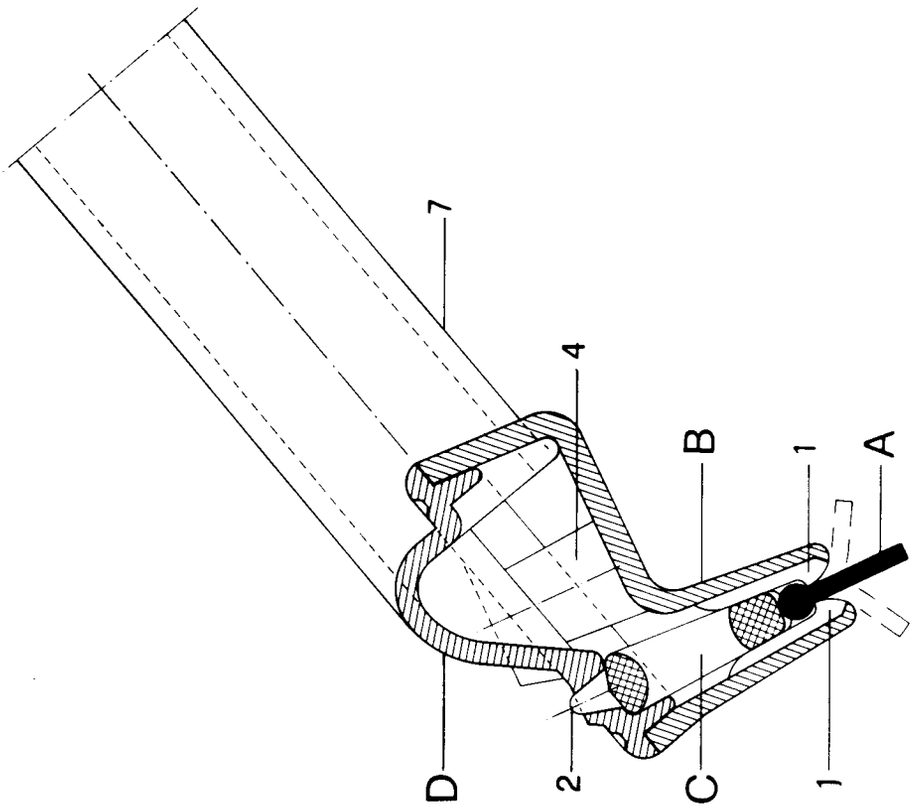


fig. 2

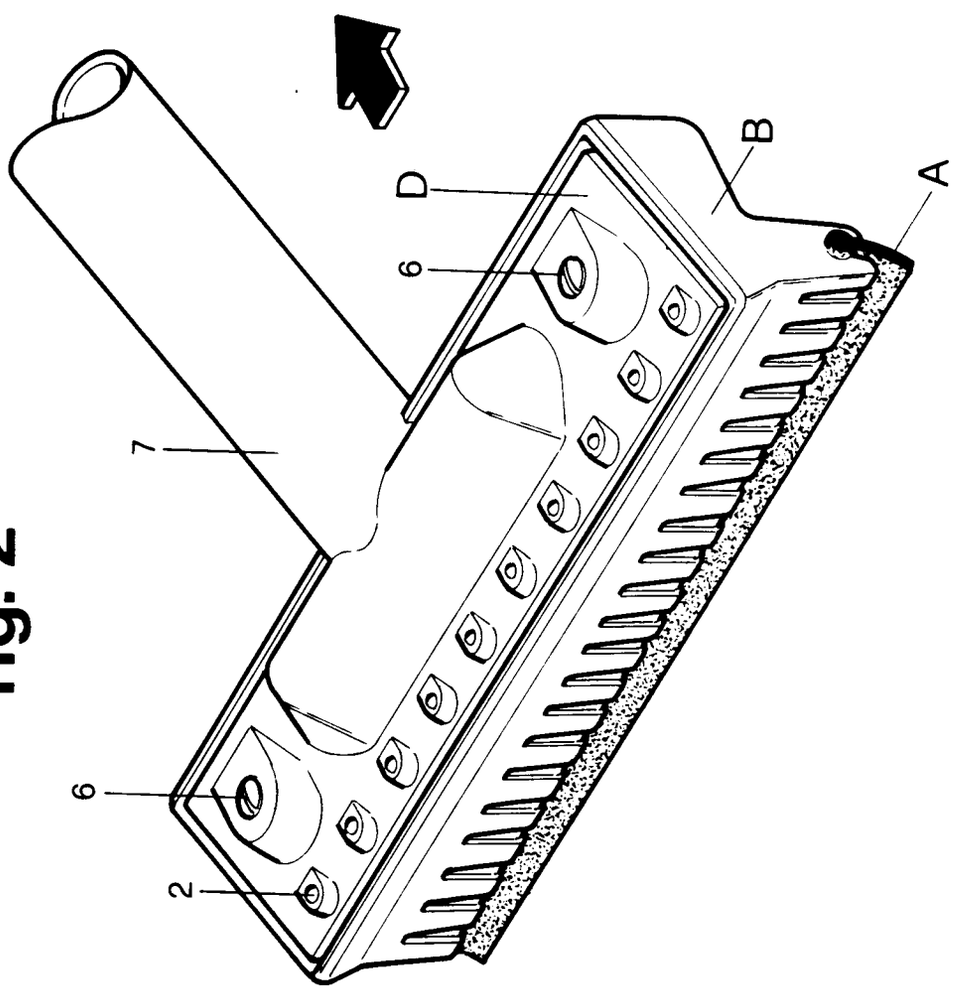


fig. 5

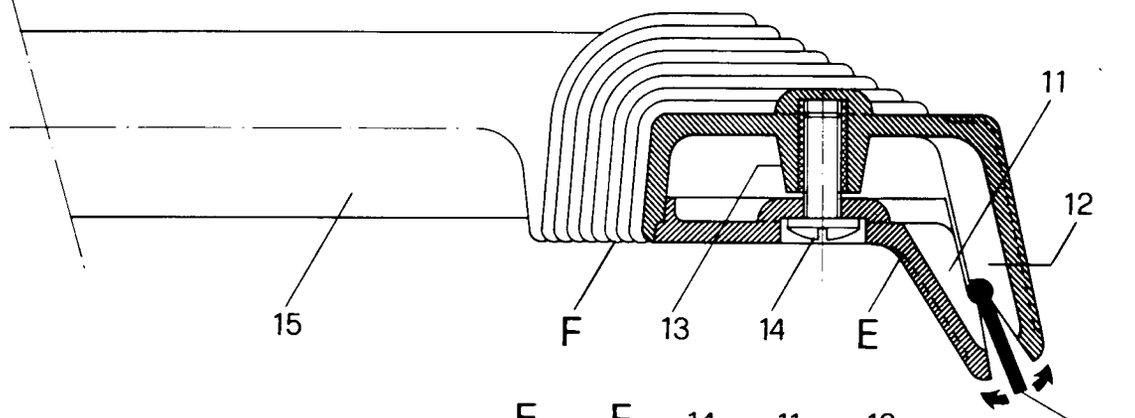
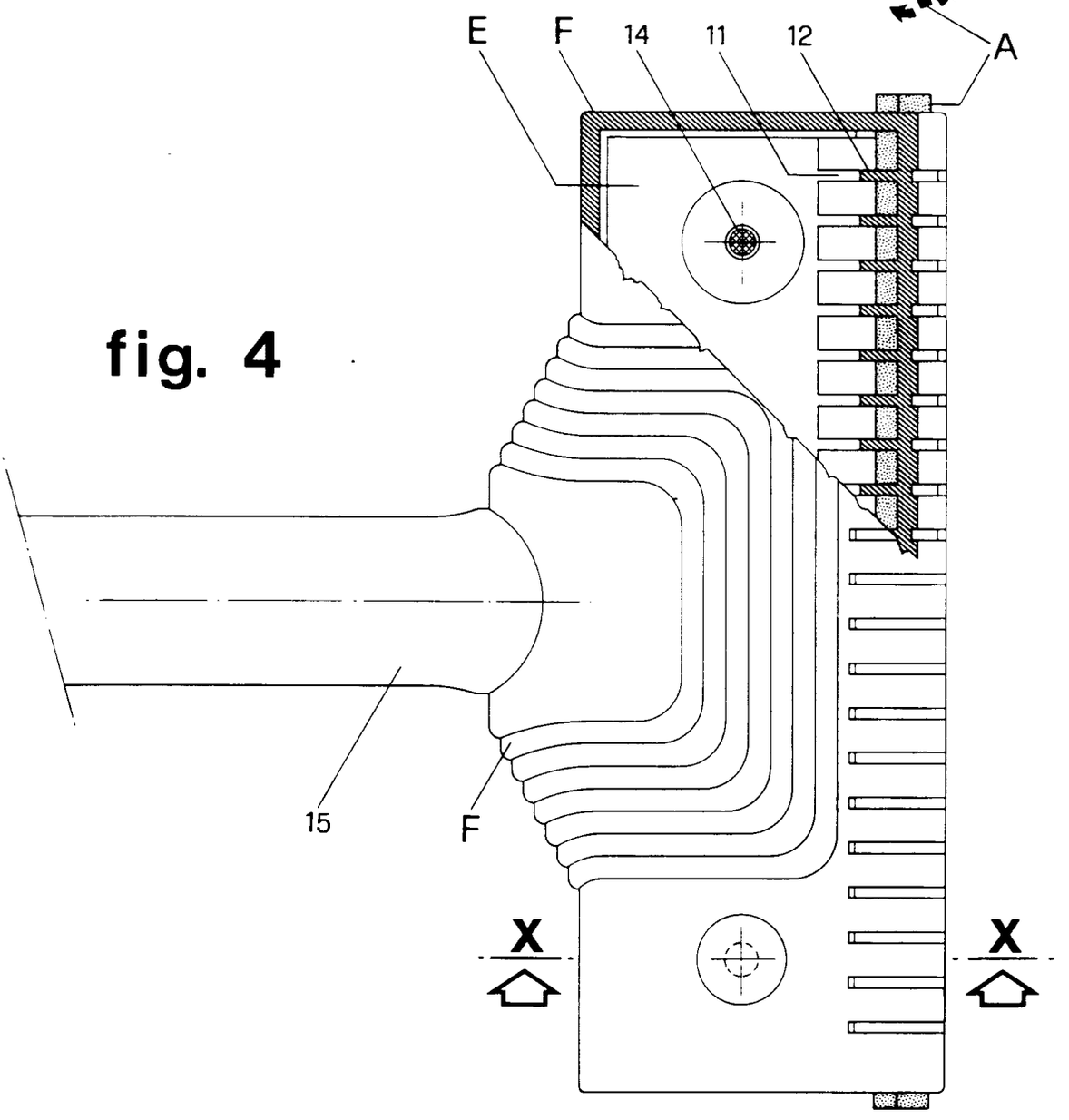


fig. 4



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EUROPEAN SEARCH REPORT

Application Number

EP 91 12 1816

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.5)
Y	DE-A-2 139 157 (PAUL ANDRÄ KG) * page 4, line 26 - page 5, line 9; claims 1,2,4; figures *	1	A47L9/02 A47L11/30
Y A	US-A-2 218 595 (YUTZLER) * page 1, right column, line 18 - line 43; figures *	1 3	
A	DE-U-1 931 968 (ELECTROSTAR GMBH) * claims 1,3,5; figure 1 *	1,3	
A	US-A-3 210 792 (SASSANO) * column 3, line 26 - line 52; figures 1,7 *	1,2,6,7	
A	US-A-3 072 951 (KELNHOFER) * column 2, line 49 - column 3, line 6; figures 2,3 *	1,2	
A	EP-A-0 128 608 (SHOP-VAC CORP.) * claim 1; figures 3,6 *	1,7	
A	DE-U-6 906 522 (HOOVER LTD.) * claims 1,4,12; figures *	1,3	TECHNICAL FIELDS SEARCHED (Int. Cl.5) A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	19 AUGUST 1992	KANAL P.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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