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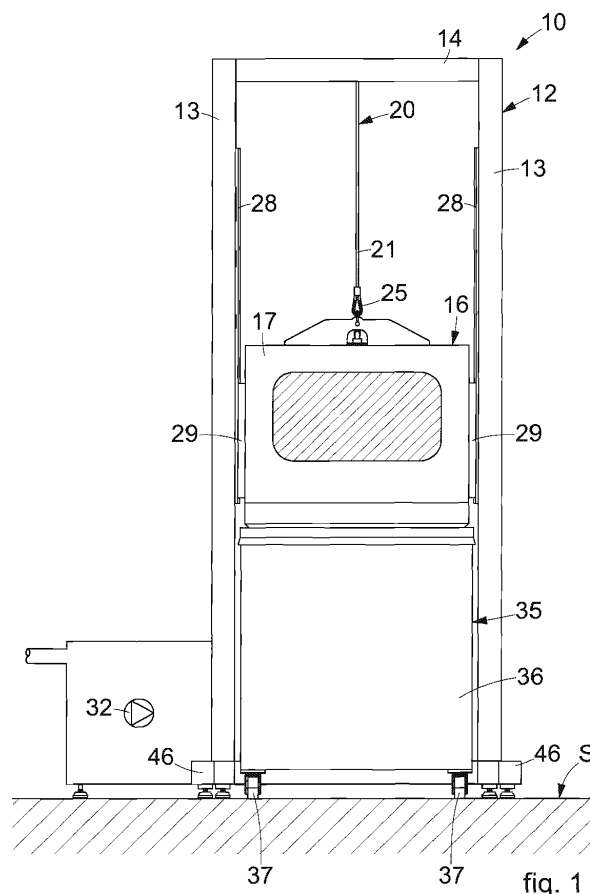
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(54) **APPARATUS AND METHOD FOR WASHING A SLICER OR SIMILAR EQUIPMENT**

(57) Apparatus (10) for washing a slicer (11) or similar equipment, comprising a containing frame (12), a support member (35) for the slicer (11), a containing member (16) mobile between an idle position and a work

position in which, together with the support member (35), it defines a washing chamber (44) for the slicer (11), and a washing member (24) contained, at least partly, inside the washing chamber (44).



Description

FIELD OF THE INVENTION

[0001] The present invention concerns an apparatus and a method for washing equipment for cutting, mainly, meat and cured meats, but also vegetables, fruit or other foodstuff.

[0002] Such equipment can be, for example but with no limits to generality, slicers or meat mincers, or also squeezers, grinders or suchlike, and find application, for example but with no limits to generality, in the industrial, catering or mass distribution sectors.

BACKGROUND OF THE INVENTION

[0003] The need to scrupulously clean and sanitize equipment for meat and cured meats is known, such as, for example, slicers or meat mincers which are typically used daily in mass distribution premises, in the kitchens of public catering establishments, in butchers or even in small grocery stores.

[0004] Hereafter in the description we will mainly discuss slicers, however we intend to include equipment for food use in general, in particular intended for public use, for example a sales counter in a shop, and provided with blades or other dangerous tools which, during use, retain food residues which have to be periodically removed in order to prevent contamination and keep the equipment clean for subsequent uses.

[0005] In the specific case of slicers, this cleaning is necessary since the fat residues which normally deposit on the equipment, in particular on the cutting members, give rise to bacterial loads which can contaminate other foodstuff and emanate unpleasant odors.

[0006] Furthermore, in some cases it is necessary to carry out the cleaning even several times a day in order to comply with the regulations and standards that govern environmental hygiene in the food sector.

[0007] To date, the cleaning of such equipment is performed manually, it requires the disassembly of some parts of the equipment and takes an operator even up to 40 minutes.

[0008] Moreover, to carry out the cleaning operations, the specialized operator also runs the risk of cutting his/her hands and fingers due, for example, to the contact with the sharp elements of the equipment.

[0009] As a consequence, these cleaning operations are deferred over time, are not carried out with due care and attention, and can cause even serious injuries which can keep the operator away from work even for long periods of time, and in the worst cases cause damage, even of a permanent nature, with consequent potential compensation issues for managers.

[0010] There is therefore a need to perfect an apparatus for washing a slicer, or similar equipment, as indicated above, which can overcome at least one of the disadvantages of the state of the art.

[0011] In particular, one purpose of the present invention is to provide an apparatus for washing a slicer which can reduce the risk of injury to the operator.

[0012] Another purpose of the present invention is to provide an apparatus for washing a slicer which can reduce the time required to carry out a deep washing of the slicer.

[0013] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0014] The present invention is set forth and characterized in the independent claims. The dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0015] In accordance with the above purposes and to achieve even considerable advantages in terms of efficiency and speed of the operations, an apparatus according to the present invention for washing a slicer comprises a containing frame, a support member disposed inside the frame to support the slicer, a containing member mobile inside the containing frame between an idle position and a work position in which, together with the support member, it defines a washing chamber configured to contain the slicer, and a washing member configured to be contained, at least partly, inside the washing chamber and able to be selectively activated in order to deliver a washing liquid in the washing chamber.

[0016] In accordance with another aspect of the present invention, the containing member comprises a cover provided with a bottom aperture, and the support member comprises a rest plane for the slicer, the washing chamber therefore being delimited by the cover and by the rest plane.

[0017] In accordance with another aspect of the present invention, the washing member comprises at least one rotating member attached to the cover and comprising at least one nozzle for delivering a washing liquid.

[0018] In accordance with another aspect of the present invention, the washing member comprises a plurality of rotating members attached to the cover and a plurality of solenoid valves, each of which is disposed upstream of a rotating member.

[0019] In accordance with another aspect of the present invention, the support member is also provided with a discharge aperture disposed on the rest plane and with a discharge conduit fluidically connected to the discharge aperture.

[0020] In accordance with another aspect of the present invention, the apparatus also comprises a sealing element configured to guarantee the hermetic seal of the contact zones between the containing member and the support member.

[0021] In accordance with another aspect of the present invention, the apparatus also comprises a clos-

ing member configured to press the containing member against the support member.

[0022] In accordance with another aspect of the present invention, the apparatus also comprises drying means configured to dry the slicer at the end of the washing.

[0023] In accordance with another aspect of the present invention, the support member comprises a trolley configured to be coupled to a plurality of removable and interchangeable upper portions, each comprising a rest plane suitably shaped as a function of the shape of the slicer to be washed.

[0024] In accordance with another aspect of the present invention, the containing frame defines a washing zone, and the support member is independent and mobile inside the containing frame in order to be selectively disposed in, and removed from, the washing zone.

[0025] The present invention also concerns a method to wash a slicer by means of an apparatus that comprises:

- a containing frame comprising a washing zone;
- a support member disposed inside the containing frame to support the slicer;
- a containing member mobile inside the containing frame between an idle position and a work position in which it defines, together with the support member, a washing chamber configured to contain the slicer; and
- a washing member configured to be contained, at least partly, inside the washing chamber and able to be selectively activated to deliver a washing liquid in the washing chamber.

[0026] In accordance with another aspect of the present invention, the method comprises the following steps:

- disposing the slicer on the support member;
- disposing the support member in the washing zone;
- disposing the containing member in the work position;
- driving the washing member to perform the washing of the slicer.

DESCRIPTION OF THE DRAWINGS

[0027] These and other aspects, characteristics and advantages of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a schematic front view of an apparatus for washing a slicer, according to one embodiment of the present invention, in a work position;
- fig. 2 is a schematic front view of the apparatus of fig. 1, in an idle position;
- fig. 3 is a schematic lateral section of the apparatus

of fig. 1 in the work position;

- fig. 4 is a schematic lateral section of the apparatus of fig. 1 in the idle position;
- fig. 5 is a schematic front section of the apparatus of fig. 1 in the work position;
- fig. 6 is a hydraulic diagram of the apparatus of fig. 1
- figs. 7 and 8 are schematic lateral views of a part of the apparatus of fig. 1;
- figs. 9 and 10 are enlargements of a part of the apparatus of fig. 1.

[0028] We must clarify that in the present description the phraseology and terminology used, as well as the figures in the attached drawings also as described, have the sole function of better illustrating and explaining the present invention, their function being to provide a non-limiting example of the invention itself, since the scope of protection is defined by the claims.

[0029] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can be conveniently combined or incorporated into other embodiments without further clarifications.

DESCRIPTION OF SOME EMBODIMENTS OF THE PRESENT INVENTION

[0030] With reference to fig. 1, an apparatus 10 for washing a slicer 11, according to the present invention, comprises a containing frame 12 suitable to be attached to/rested on the ground S, comprising two vertical uprights 13 disposed side by side which define a washing zone Z between them (fig. 2).

[0031] We must clarify that in the present description and in the attached claims, by the term slicer 11 we mean any professional or industrial equipment for dicing, mincing, cutting mainly meat and cured meats, or possibly also vegetables, fruit or other elements. Preferably, the apparatus 10 of the present invention is suitable to wash any professional or industrial, or even domestic, equipment for dicing, mincing, cutting meat and cured meats, or other. Preferably, but not necessarily, such professional or industrial equipment has a water-resistance rating corresponding to IP 66, or higher, and it is provided with cutting, mincing, dicing elements or other, which therefore generates a risk for the operators in the washing operations.

[0032] The containing frame 12 also comprises an upper upright 14 attached in correspondence with the upper ends of both vertical uprights 13.

[0033] To the containing frame 12 there is attached sliding a containing member 16 which comprises a cover 17, interposed between the two vertical uprights 13, having a substantially box-like shape which defines an internal cavity 18 (figs. 3 and 4) accessible by means of a bottom aperture 19.

[0034] The apparatus 10 also comprises a movement

member 20 configured to move the cover 17 in a vertical direction with respect to the vertical uprights 13.

[0035] In the example given here, the movement member 20 comprises a rope 21, preferably a metal rope, which runs on a first pulley 22 and on a second pulley 23.

[0036] A first end 25 of the rope 21 is connected to the cover 17 while a second end 26 of the rope 21 is connected to a counterweight 27 comprising, for example, one or more blocks of metal or other suitable material.

[0037] The movement member 20 also comprises a pair of guides 28 attached to the vertical uprights 13 and corresponding slides 29 attached to the cover 17 and configured to slide on the guides 28.

[0038] The weight of the counterweight 27 substantially corresponds to the weight of the cover 17 in order to facilitate the movement thereof with respect to the vertical uprights 13 by an operator.

[0039] Also associated with the cover 17 is a washing member 24 which, in the example given here, comprises a plurality of rotating members 30 each provided with a central pin and with one or more arms which extend laterally with respect to the central pin, and which are provided with nozzles 31 at the ends.

[0040] A first rotating member 30 is disposed inside the cavity 18 of the cover 17, in correspondence with its upper portion, while two other rotating members 30 are disposed inside the cavity 18 of the cover 17, in lateral and facing positions.

[0041] In one embodiment, each nozzle 31 emits at least one jet of water slightly inclined with respect to the respective axis of rotation which therefore, by reaction, causes the rotation of the respective rotating member 30 with respect to the central pin.

[0042] In another embodiment, the central pin of each rotating member 30 is connected to a respective electric motor (not shown) configured to make the rotating member 30 rotate.

[0043] The washing member 24 also comprises a hydraulic pump 32 and a hydraulic circuit connected to the latter and to the nozzles 31, and which also comprises a plurality of solenoid valves 33 (fig. 6), each of which is disposed upstream of a respective rotating member 30.

[0044] The hydraulic pump 32 is suitable to deliver water, or any other washing liquid, at a pressure of about 100 bar - 300 bar into the hydraulic circuit.

[0045] Moreover, a control unit 34 is configured to selectively open one or more solenoid valves 33, even independently of each other, according to any predetermined cycle whatsoever.

[0046] In addition, the control unit 34 is also configured to regulate the operation of the hydraulic pump 32.

[0047] The apparatus 10 also comprises a support member 35 (figs. 1, 3 and 4) configured to support the slicer 11 and suitable to be disposed between the two vertical uprights 13 of the containing frame 12, under the cover 17.

[0048] In the example given here, the support member 35 comprises a trolley 36 provided with wheels 37 and

independent with respect to the containing frame 12.

[0049] The trolley 36 comprises a rest plane 39 for the slicer 11, on which a discharge aperture 40, fluidically connected to a discharge conduit 41, is made.

[0050] Preferably, the rest plane 39 of the trolley 36 has the shape of a funnel (fig. 3) which flows toward the discharge aperture 40.

[0051] Or, alternatively, the rest plane 39 of the trolley 36 constitutes a substantially flat lowered position, surrounded laterally by lateral edges 42 which are higher than the rest plane 39 (fig. 4).

[0052] Optionally, the trolley 36 comprises a removable upper portion 43 which in turn comprises the rest plane 39 of the trolley 36. In this case, the apparatus 10 can comprise even more than one upper portion 43, which can be coupled to the trolley 36 and are interchangeable with each other, and have different shapes from each other, so as to allow an operator to use the one that constitutes the rest plane 39 most suitable to support the slicer 11 to be washed.

[0053] The cover 17 is mobile in the vertical direction from a work position (figs. 1 and 3) in which it is in contact with the support member 35 and defines a washing chamber 44 delimited by the cavity 18 and by the rest plane 39 of the trolley 36, to an idle position (figs. 2 and 4) in which it is not in contact with the support member 35.

[0054] The washing chamber 44 has to be suitable to contain inside it the slicer 11 to be subjected to the washing treatment, therefore the cover 17 has to be shaped as a function of the shape and the overall dimensions typical of industrial slicers 11.

[0055] Furthermore, the movement member 20 has to be able to take the cover 17 to an idle position which allows to easily dispose and remove the slicer 11 in/from the washing zone Z.

[0056] For example, a slicer 11 disposed on a trolley 36 can be taken under the cover 17 by pushing the trolley 36 in order to dispose it between the two vertical uprights 13 and under the cover 17.

[0057] This allows to take the trolley 36 into the washing zone Z only when it is required to wash the slicer 11 while, when the washing of the latter is not required, the slicer 11 can remain on the trolley 36 and be used by an operator as normal.

[0058] In doing so, the trolley 36 acts as a support for the washing, and also as a workbench, as well as a transport device for the slicer 11.

[0059] Optionally, a guide element 46 is attached to the lower part of each vertical upright 13 so as to form a pair of guide elements 46 (figs. 1 and 2) converging toward the washing zone Z, which facilitate the insertion of the trolley 36 between the vertical uprights 13.

[0060] Preferably, the apparatus 10 also comprises a sealing member 48 (figs. 9 and 10) configured to prevent the washing water from escaping from the washing chamber 44 in correspondence with the contact zones between the containing member 16 and the support member 35.

[0061] In the example given here, the sealing member 48 comprises a packing 49 attached to the cover 17 in correspondence with the bottom aperture 19 and configured to be compressed between the cover 17 and the trolley 36 when the cover 17 is in the work position.

[0062] Moreover, the apparatus 10 also comprises a closing member 50 (figs. 7 and 8) configured to press the containing member 16 against the support member 35 so as to generate the correct pressure suitable to guarantee the seal of the sealing member 48.

[0063] The closing member 50 comprises a lever 51 pivoted to one, or to both, of the vertical uprights 13 and comprising, in turn, a drive portion 53 configured to be moved by a user and a lifting portion 54.

[0064] Specifically, the lever 51 is configured to pass from an extracted position (fig. 7) to an inserted position (fig. 8) in which the lifting portion 54 contacts and slightly lifts the counterweight 27 when the cover 17 is in the work position.

[0065] In doing so, the cover 17 presses with all its weight on the packing 49, slightly deforming it so as to guarantee the hermetic seal in correspondence with the contact zone between the cover 17 and the trolley 36 (fig. 10).

[0066] Optionally, the apparatus 10 also comprises one or more sensors (not shown) for detecting the reciprocal position between the containing member 16, the support member 35 and the closing member 50, which are connected to the control unit 34.

[0067] Specifically, the control unit 34 is configured to detect, by means of the sensors, whether the containing member 16 is above the support member 35 and the lever 51 of the closing member 50 is in the inserted position. When the control unit 34 detects that the containing member 16 is above the support member 35 and the lever 51 of the closing member 50 is in the inserted position, it enables the activation of the pump 32.

[0068] The apparatus 10 also comprises a discharge manifold 57 (figs. 3 and 4) disposed in a position mating with that of the discharge conduit 41 of the trolley 36 and configured to collect the water coming from the latter. Preferably, the discharge manifold 57 is disposed laterally with respect to the counterweight 27.

[0069] Optionally, the apparatus 10 also comprises a device 58 for heating the water (fig. 6), disposed upstream or downstream of the hydraulic pump 32 and configured to heat the washing water. The heating device 58 is connected to the control unit 34 which manages its operation in order to regulate the heating of the water.

[0070] Moreover, the apparatus 10 can also comprise drying means 60, commanded by the control unit 34, which are configured to dry the slicer 11 at the end of the washing.

[0071] In the example given here, shown in fig. 5, the drying means 60 comprise a ventilation member 61 attached to the containing member 16 and suitable to create a flow of air directed toward the rest plane 39 on which the slicer 11 is disposed, during use.

[0072] The operation of the apparatus 10 for washing a slicer 11 described heretofore, which corresponds to the method according to the present invention, comprises the following steps.

5 **[0073]** Initially, the cover 17 is taken into the idle position and the trolley 36 which supports the slicer 11 to be washed is pushed into the washing zone Z by an operator.

10 **[0074]** When the trolley 36 is in the washing zone Z and directly under the cover 17, the latter is taken into the work position, that is, in contact with the trolley 36.

[0075] Then, the operator takes the lever 51 into the inserted position so as to cause the compression of the packing 49 between the cover 17 and the trolley 36. In this way, the washing chamber 44 is hermetically closed and the washing water can flow out of it only through the discharge aperture 40.

15 **[0076]** At this point, the control unit 34 detects, by means of the sensors, that the containing member 16 is above the support member 35 and that the lever 51 of the closing member 50 is in the inserted position, and consequently enables the activation of the pump 32.

20 **[0077]** Subsequently, the control unit 34 drives the hydraulic pump 32 and opens one solenoid valve 33, keeping the others closed so as to spray water from the nozzles 31 downstream of the open solenoid valve 33 which, thanks to their rotation, perform the washing treatment of the slicer 11 from various angles.

25 **[0078]** Purely by way of example, the control unit 34 first commands the opening of the solenoid valve 33 corresponding to the rotating member 30 disposed in the upper portion of the cavity 18 and the closure of the other solenoid valves 33 for a time interval of about 20 seconds.

30 **[0079]** Subsequently, the control unit 34 commands the opening of the solenoid valve 33 corresponding to the rotating member 30 disposed in the left lateral portion of the cavity 18 and the closure of the other solenoid valves 33 for a time interval of about 20 seconds.

35 **[0080]** Finally, the control unit 34 commands the opening of the solenoid valve 33 corresponding to the rotating member 30 disposed in the right lateral portion of the cavity 18 and the closure of the other solenoid valves 33 for a time interval of about 20 seconds.

40 **[0081]** The control unit 34 then commands the switching off of the hydraulic pump 32 and, moreover, an operator positions the lever 51 in the extracted position.

45 **[0082]** Optionally, the control unit 34 also activates the drying means 60 to dry the slicer 11.

50 **[0083]** Finally, the user lifts the cover 17 up to the idle position and then extracts the trolley 36, and the slicer 11 disposed thereon, from the washing zone Z.

[0084] It is clear that modifications and/or additions of parts may be made to the apparatus 10 and to the method for washing an industrial slicer as described heretofore, without departing from the field and scope of the present invention, as defined by the claims.

55 **[0085]** It is also clear that, although the present invention has been described with reference to some specific

examples, a person of skill in the art will be able to achieve other equivalent forms of apparatus 10 for washing an industrial slicer, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

[0086] In the following claims, the sole purpose of the references in brackets is to facilitate their reading and they must not be considered as restrictive factors with regard to the field of protection defined by the same claims.

Claims

1. Apparatus (10) for washing a slicer (11), **characterized in that** it comprises a containing frame (12), a support member (35) disposed inside said containing frame (12) to support said slicer (11), a containing member (16) also disposed inside said containing frame and mobile between an idle position and a work position in which, together with said support member (35), it defines a washing chamber (44) configured to contain said slicer (11), and a washing member (24) configured to be contained, at least partly, inside said washing chamber (44) and able to be selectively activated to deliver a washing liquid in said washing chamber (44).
2. Apparatus (10) as in claim 1, **characterized in that** said containing member (16) comprises a cover (17) which defines inside it an internal cavity (18) accessible through a bottom aperture (19), and said support member (35) comprises a rest plane (39) for said slicer (11), **and in that** said washing chamber (44) is delimited by said internal cavity (18) and by said rest plane (39).
3. Apparatus (10) as in claim 1 or 2, **characterized in that** said washing member (24) comprises at least one rotating member (30) attached to said cover (17) and provided with at least one nozzle (31).
4. Apparatus (10) as in claim 1 or 2, **characterized in that** said washing member (24) comprises a plurality of rotating members (30) attached to said cover (17) and a plurality of solenoid valves (33), each of which is disposed upstream of one of said rotating members (30).
5. Apparatus (10) as in any claim hereinbefore, **characterized in that** said support member (35) is also provided with a discharge aperture (40) made on said rest plane (39) and with a discharge conduit (41) fluidically connected to said discharge aperture (40).
6. Apparatus (10) as in any claim hereinbefore, **characterized in that** it also comprises a sealing element (48) configured to guarantee the hermetic seal in cor-

respondence with the contact zones between said containing member (16) and said support member (35).

7. Apparatus (10) as in any claim hereinbefore, **characterized in that** it also comprises a closing member (50) configured to press said containing member (16) against said support member (35).
8. Apparatus (10) as in any claim hereinbefore, **characterized in that** it also comprises drying means (60) configured to dry said slicer (11) at the end of the washing.
9. Apparatus (10) as in any claim hereinbefore, **characterized in that** said support member (35) comprises a trolley (36) configured to be coupled to a plurality of removable and interchangeable upper portions (43), each comprising a rest plane (39) suitably shaped as a function of the shape of the slicer (11) to be washed.
10. Apparatus (10) as in any claim hereinbefore, **characterized in that** said containing frame (12) defines a washing zone (Z) and said support member (35) is independent and mobile with respect to said containing frame (12) in order to be selectively disposed in, and removed from, said washing zone (Z).
11. Method to wash an industrial slicer (11) by means of an apparatus (10) that comprises:
 - a containing frame (12) comprising a washing zone (Z);
 - a support member (35) provided with a rest plane (29) for said slicer (11);
 - a containing member (16) disposed inside said containing frame (12) and mobile between an idle position and a work position in which it defines, together with said support member (35), a washing chamber (44) configured to contain said slicer (11); and
 - a washing member (30) configured to be contained, at least partly, inside said washing chamber (44) and able to be selectively activated to deliver a washing liquid in said washing chamber (44);
 said method being **characterized in that** it comprises the following steps:
 - disposing said slicer (11) on said rest plane (39);
 - disposing said support member (35) in said washing zone (Z);
 - disposing said containing member (16) in said work position;
 - driving said washing member (24) to perform

the washing of said slicer (11).

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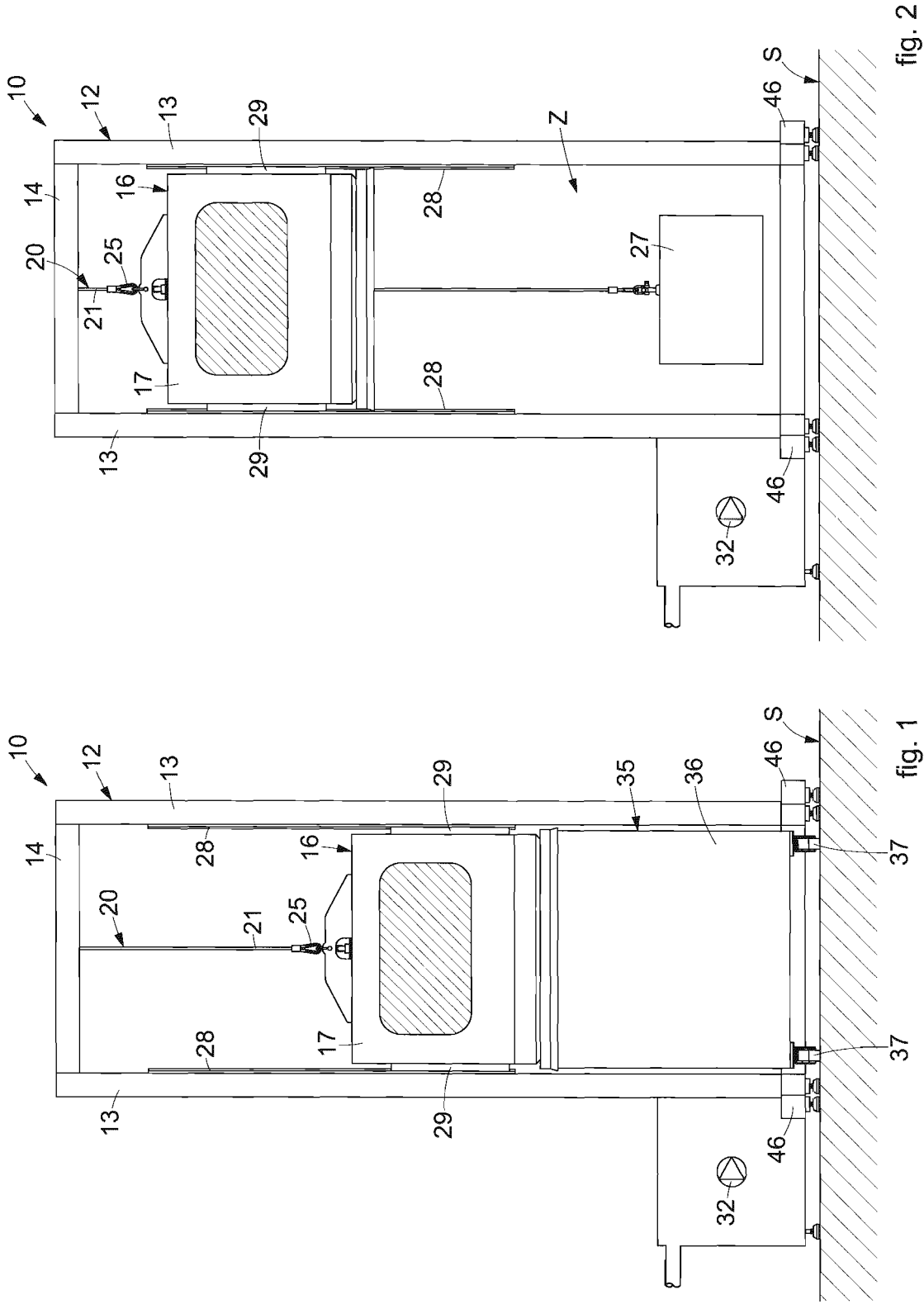
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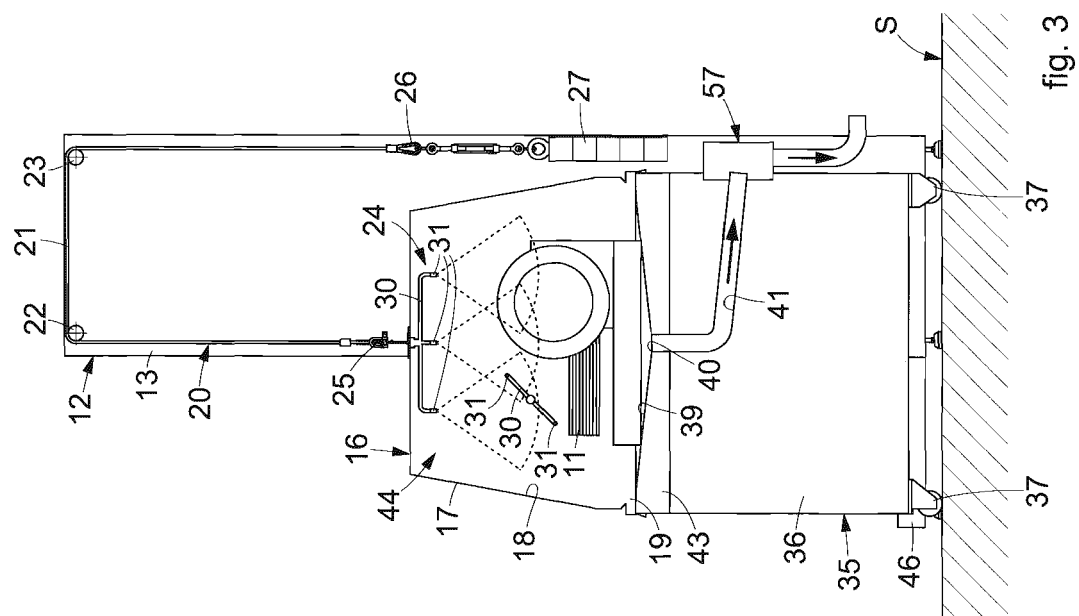
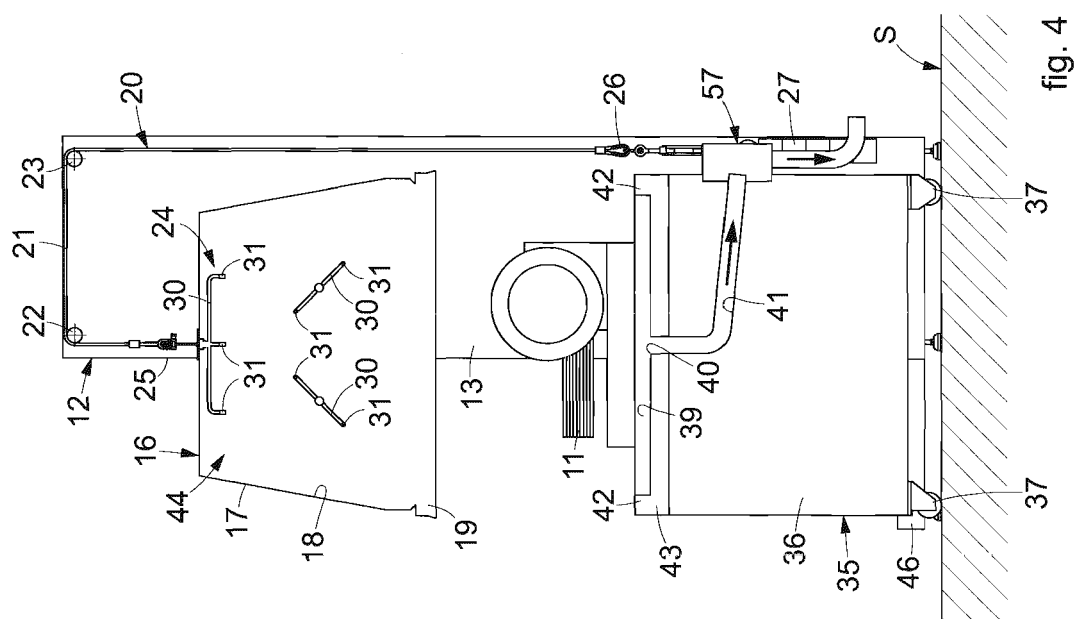
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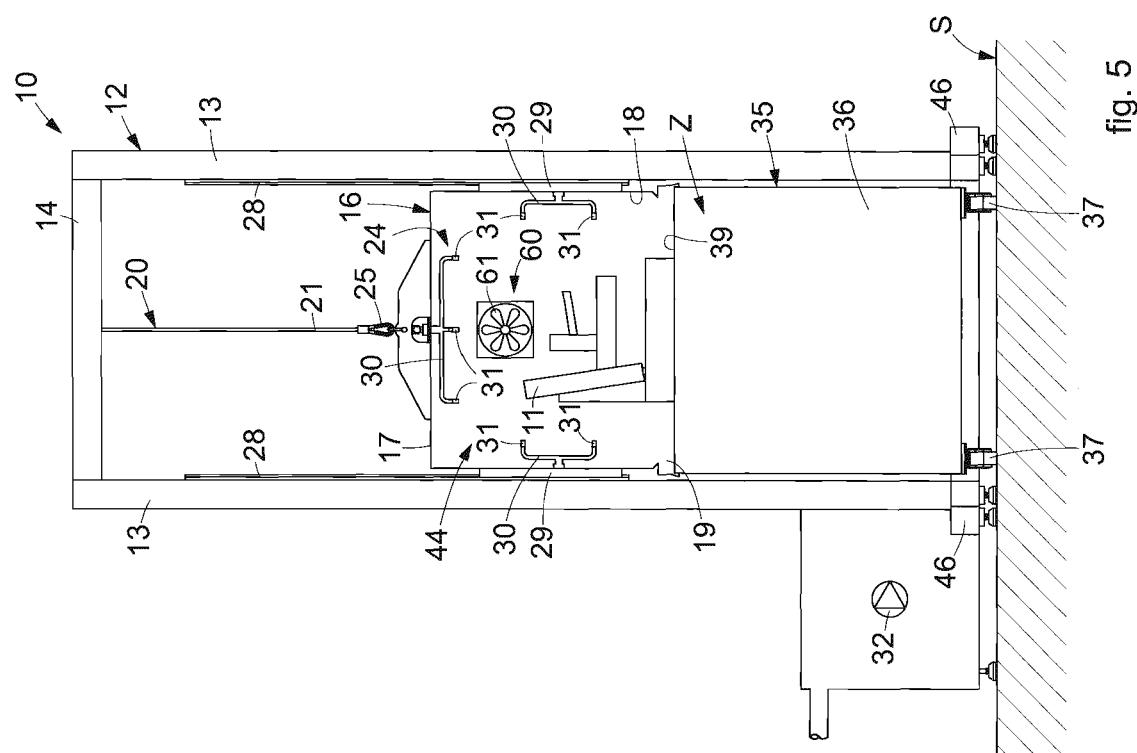


fig. 5

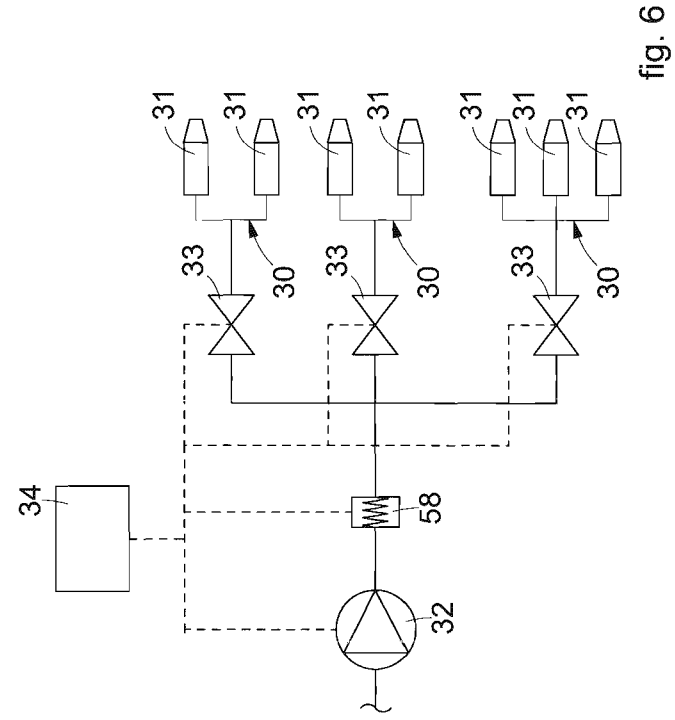


fig. 6

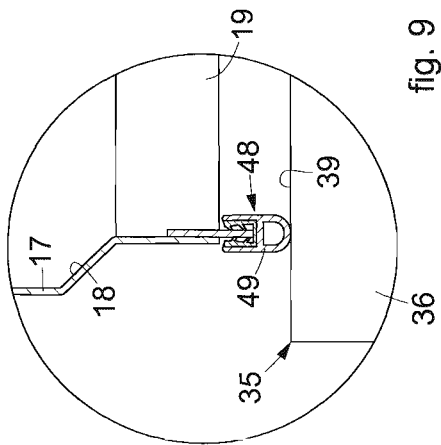


fig. 9

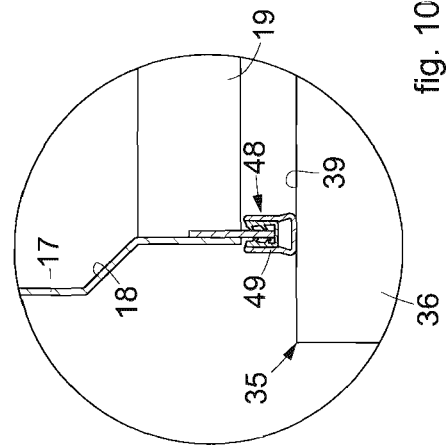


fig. 10

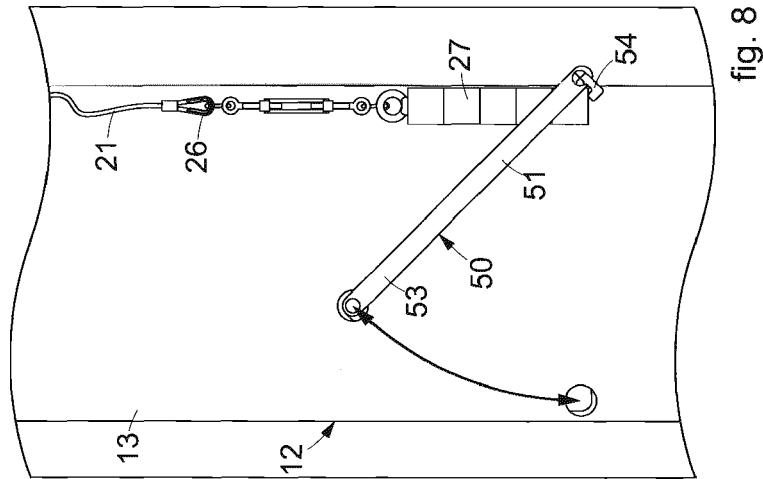


fig. 8

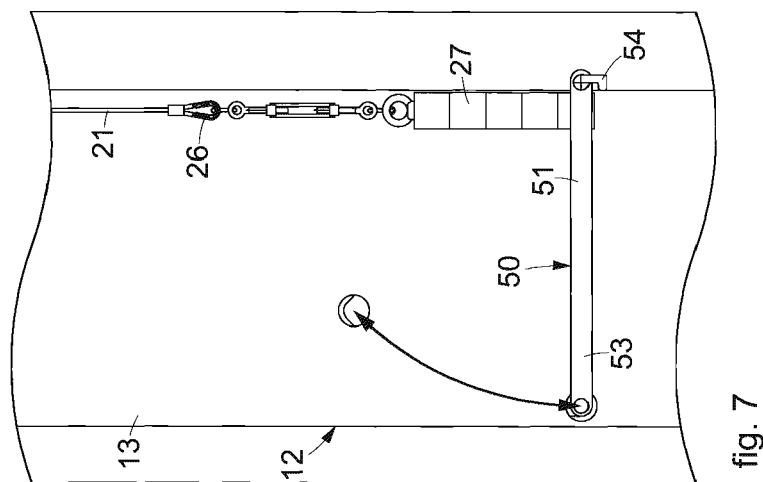


fig. 7



EUROPEAN SEARCH REPORT

Application Number

EP 23 15 3365

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 308 688 A1 (ILLINOIS TOOL WORKS [US]) 18 April 2018 (2018-04-18)	1-8, 11	INV. A47L15/00
Y	* paragraph [0093] * * paragraph [0016] * * figures 1-6 *	9, 10	B26D7/08
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Y	* figures 1, 3 *	9, 10	

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Y	US 5 904 162 A (FERGUSON MARK A [US] ET AL) 18 May 1999 (1999-05-18)	9, 10	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B26D A47L
Place of search		Date of completion of the search	Examiner
Munich		3 May 2023	Bermejo, Marco
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		& : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 23 15 3365

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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