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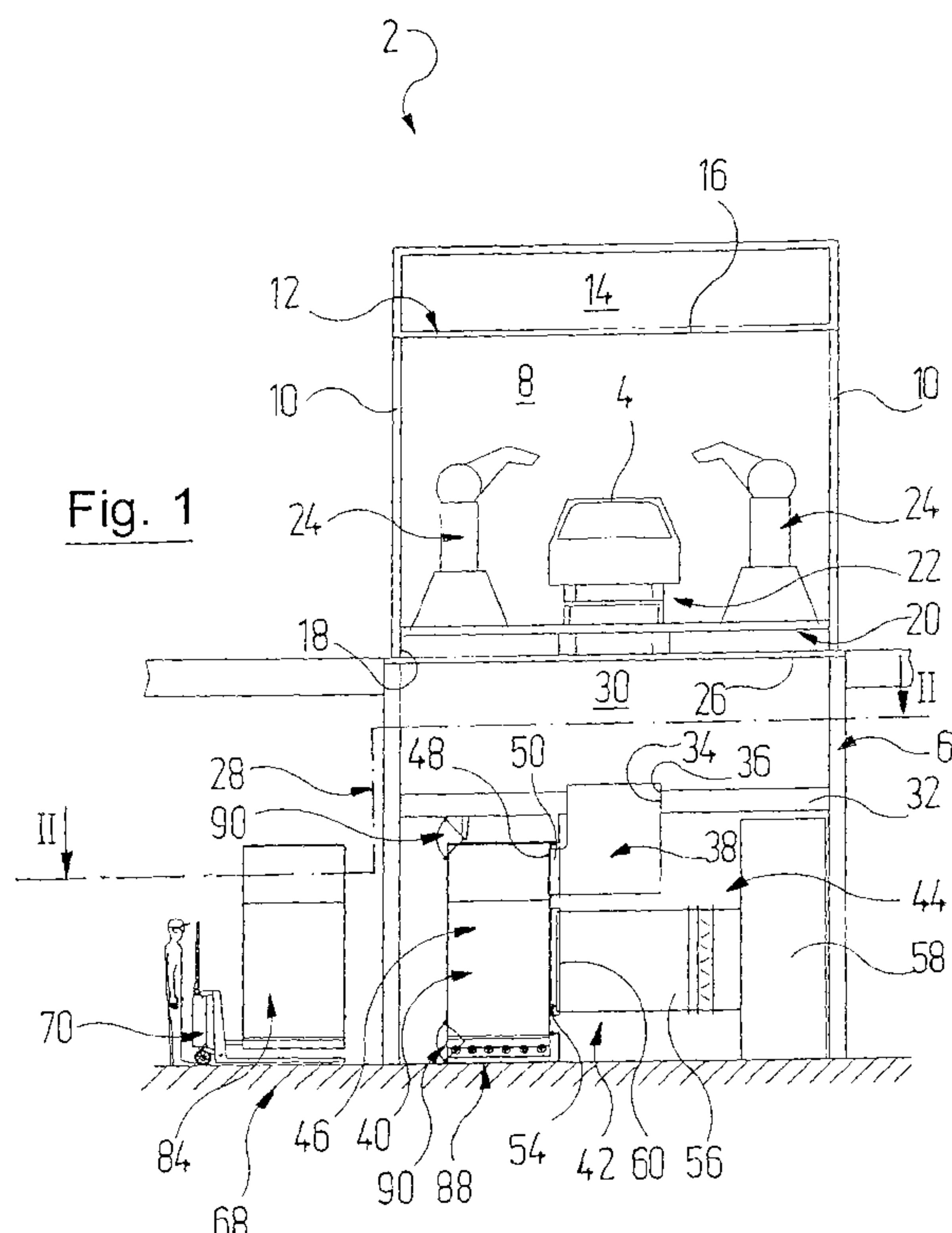
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(54) Titre : PROCEDE ET DISPOSITIF DESTINES A SEPARER DES AEROSOLS DE PEINTURE EXCEDENTAIRES
AINSI QU'INSTALLATION COMPORTANT UN TEL
(54) Title: METHOD AND DEVICE FOR PRECIPITATING OVERSPRAY AND INSTALLATION PROVIDED THEREWITH



(57) Abrégé/Abstract:

In a method for precipitating overspray from the overspray-laden booth exhaust air of coating installations, in particular from painting installations, the overspray is carried by an air stream to a precipitation device (42), where a majority at least of the solid material is precipitated from the overspray. The overspray-laden booth exhaust air is guided through filter modules (40), in which overspray is precipitated and which are designed as replaceable one-way components having a filter housing (46) and a filter unit (52), wherein each filter module (40) is replaced by an empty filter module (40) after reaching a loading with overspray. Moreover, the invention relates to a device for precipitating overspray by means of such one-way filter modules, and to an installation for coating objects (4), in particular vehicle bodies.

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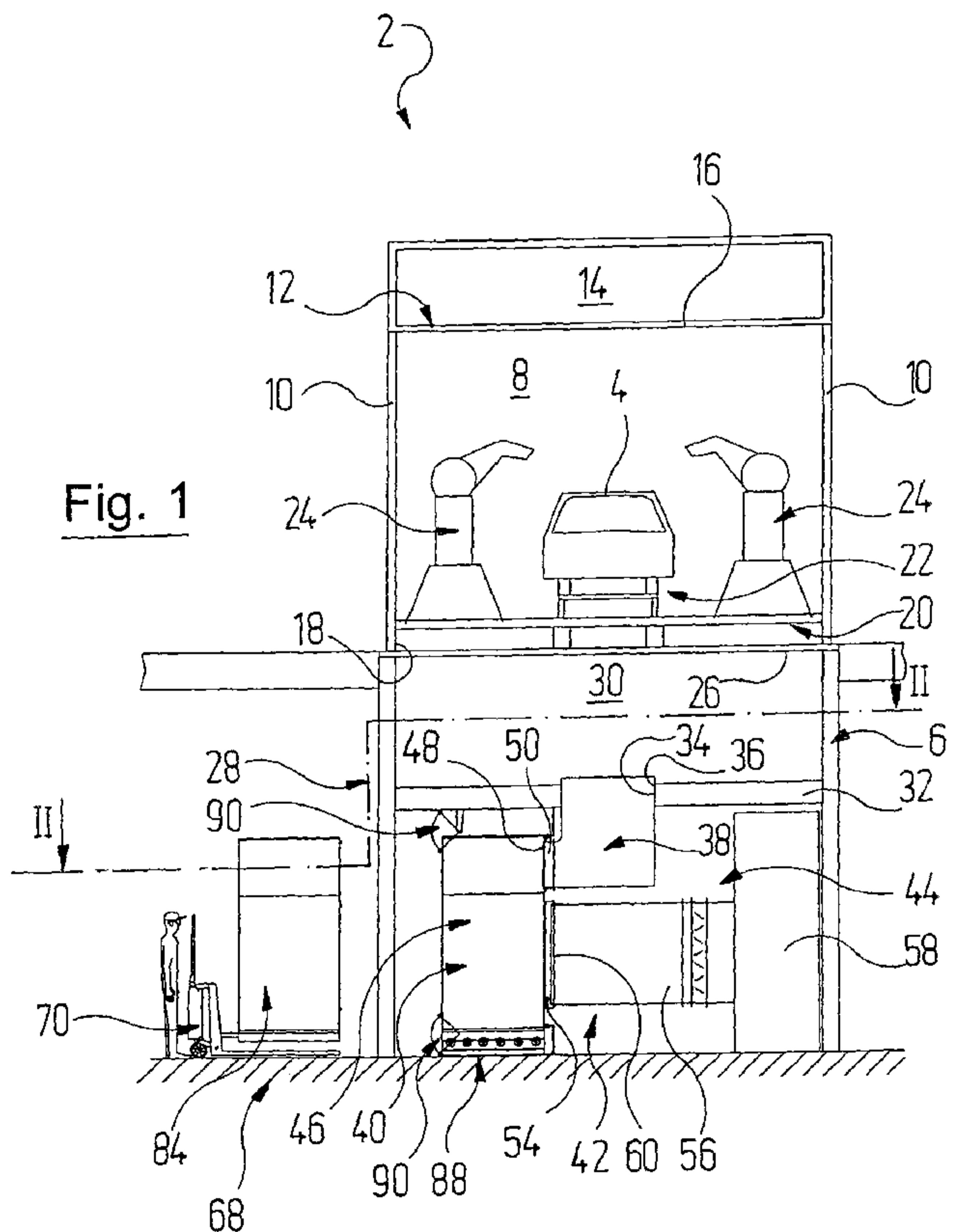
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[Fortsetzung auf der nächsten Seite]

(54) **Title:** METHOD AND DEVICE FOR PRECIPITATING OVERSPRAY AND INSTALLATION PROVIDED THEREWITH

(54) **Bezeichnung:** VERFAHREN UND VORRICHTUNG ZUM ABSCHEIDEN VON OVERSPRAY SOWIE ANLAGE MIT EINER SOLCHEN



(57) **Abstract:** In a method for precipitating overspray from the overspray-laden booth exhaust air of coating installations, in particular from painting installations, the overspray is carried by an air stream to a precipitation device (42), where a majority at least of the solid material is precipitated from the overspray. The overspray-laden booth exhaust air is guided through filter modules (40), in which overspray is precipitated and which are designed as replaceable one-way components having a filter housing (46) and a filter unit (52), wherein each filter module (40) is replaced by an empty filter module (40) after reaching a loading with overspray. Moreover, the invention relates to a device for precipitating overspray by means of such one-way filter modules, and to an installation for coating objects (4), in particular vehicle bodies.

(57) **Zusammenfassung:** Bei einem Verfahren zum Abscheiden von Overspray aus der

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GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

mit Overspray beladenen Kabinenluft von Beschichtungsanlagen, insbesondere von Lackieranlagen, wird der Overspray von einem Luftstrom aufgenommen und zu einer Abscheidevorrichtung (42) geführt, wo ein Großteil zumindest der Feststoffe aus dem Overspray abgeschieden wird. Die mit Overspray beladene Kabinenluft wird durch Filtermodule (40) geleitet, in denen sich Overspray abscheidet und welche als austauschbare Einweg-Baueinheiten mit Filtergehäuse (46) und Filtereinheit (52) ausgebildet sind, wobei jedes Filtermodul (40) nach Erreichen einer Grenzbeladung mit Overspray gegen ein leeres Filtermodul (40) ausgetauscht wird. Es sind außerdem eine Vorrichtung zum Abscheiden von Overspray mit solchen Einweg-Filtermodulen und eine Anlage zum Beschichten von Gegenständen (4), insbesondere von Fahrzeugkarosserien, angegeben.

Method and device for precipitating overspray and
installation provided therewith

The invention relates to a method for separating overspray from the overspray-laden booth air of coating plants, in particular of painting plants, in which the overspray is taken up by an air stream and guided to a 5 separating device where a majority at least of the solid materials is separated from the overspray.

The invention moreover relates to a device for separating overspray from the overspray-laden booth air of coating plants, in particular of painting plants.

10 The invention is furthermore concerned with a plant for coating, in particular for painting, objects, in particular vehicle bodies, having

- 15 a) a coating booth, in which the objects can be acted upon by coating material and through which an air stream can be conducted, which takes up and carries away the overspray produced from the coating material;
- 20 b) a separating device to which this booth air can be supplied and where a majority at least of the solid materials is separated from the overspray.

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When paints are applied manually or automatically to objects, a substream of the paint, which generally contains both solid bodies and/or binding agents as well as solvents, is not applied to the object. This substream 5 is known amongst experts as "overspray". The terms overspray, overspray particles or overspray solids will always be used below to refer to a disperse system, such as an emulsion or suspension or a combination thereof. The overspray is taken up by the air stream in the paint 10 booth and supplied for separation so that, if required, the air can be conducted back to the coating booth after suitable conditioning.

Particularly in plants with a relatively high paint consumption, for example in plants for painting vehicle 15 bodies, wet separation systems are preferably used. In commercially known wet separators, water flows together with the booth exhaust air coming from above to a nozzle accelerating the air stream. A swirling of the through-flowing booth exhaust air with the water takes place in 20 this nozzle. In this procedure, the overspray particles pass largely into the water so that the air exiting the wet separator has been substantially cleaned and the paint overspray particles reside detackified in the water. They can then be recovered from this or disposed 25 of.

In known wet separators, a relatively high amount of energy is used to circulate the very large quantities of

water required. Treating the rinsing water is costly due to the elevated use of paint-binding and detackifying chemicals and the disposal of paint sludge. Furthermore, owing to the intensive contact with the rinsing water, 5 the air absorbs a high amount of moisture which, in recirculating-air mode, in turn results in a high energy consumption for treating the air.

In contrast, in commercially known devices of the type mentioned at the outset, a dry separation process is 10 used. Particularly established in this regard are electrostatically operating separators in which the paint overspray is guided past a separating surface and separated there due to the overspray particles being ionised by an electrode device and migrating to the 15 separating surface as a result of the electrical field established between the separating surface and the electrode device. The paint overspray particles adhering to the separating surface can then be stripped from this, for example mechanically, and transported away.

20 The cleaning effect of such separators is indeed very good. However, for continuous operation, it must always be ensured that a sufficiently strong electrical field can be established between the separating surface and the electrode device, which is only possible up to a certain 25 thickness of the paint overspray layer on the separating surface since such a layer has an insulating effect. However, the necessary continuous removal of the paint

overspray from the separating surface is associated with high structural costs and can be prone to faults.

Overspray may moreover react, harden or dry on the separating surface so that it can no longer be removed by simply being stripped from the separating surface. The energy costs for such separators are moreover relatively high.

10 The object of the present invention, therefore, is to provide a method, a separating device and a plant of the type mentioned at the outset, which take these problems into account.

This object is achieved in a method of the type mentioned at the outset in that

15 the overspray-laden booth air is conducted through filter modules in which overspray is separated and which are constructed as replaceable disposable components with a filter housing and a filter unit, wherein each filter module is replaced with an empty filter module after reaching an overspray loading limit.

20 The invention is based on the awareness that, contrary to common opinion, disposable filter modules are economical and moreover environmentally friendly. In terms of energy, and also in terms of the necessary resources, treating and/or disposing of such disposable filter modules is more favourable than the expenditure on a

separating device in which the separated paint is removed from existing separating surfaces in a continuous process.

For these reasons, it is therefore favourable if a 5 replaced, overspray-laden filter module is supplied to a disposal and/or recycling process.

It has been shown to be particularly effective if an inertial filter is used as the filter unit. An inertial filter can be advantageously operated without an external 10 energy supply and results in effective separation of overspray.

With regard to a separating device of the type mentioned at the outset, the above-mentioned object is achieved in that

15 a) the separating device operates using filter modules through which overspray-laden booth air can be conducted and in which overspray is separated;

20 b) the filter modules are constructed as replaceable disposable components with a filter housing and a filter unit;

c) the separating device comprises means by which each filter module can be replaced with an empty filter module after reaching an overspray loading limit.

The advantages correspond to the advantages explained above in relation to the method.

It is analogously favourable if the filter unit is constructed as an inertial filter.

5 To achieve a good separating effect, it is particularly advantageous here if the filter unit comprises a plurality of separating elements which are arranged so as to form a flow labyrinth.

10 The separating elements preferably extend vertically and have booth air flowing around them in a horizontal direction. The overspray can then flow downwards to the separating elements.

15 If the spacing between the separating elements decreases in the flow direction and/or in a direction which is perpendicular to the flow direction, overspray particles which are still present in the booth air at the end of the flow path through the filter unit are also separated effectively.

20 In practice, filter plates, filter cartridges, compartment structures or chamber structures have proven to be favourable separating elements.

If a filter module comprises a base part constructed as a standardised supporting structure, it can be conveyed by

means of known conveyor systems which are already adapted to standardised supporting structures of this type.

In terms of the treatment or disposal of the disposable filter module, it is particularly advantageous if one 5 component, several components or all components of the filter module are made from a wet-strength recycling material.

One or more of the following materials is preferably selected as a wet-strength recycling material here: paper 10 and paperboard materials, corrugated cardboard, cardboards with vertical corrugations, cardboards with a honeycomb structure or cardboard wrap, MDF material, wood. Plastic materials, in particular such as polyethylene or polypropylene, are also suitable.

15 It can be advantageous if the filter module is constructed as a modular kit. In this case, a filter module can be assembled on site and can be transported in space-saving manner, e.g. folded flat, to its place of use.

20 To capture separated overspray effectively, it is favourable if the filter module comprises a collecting trough in which separated overspray collects.

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The collecting trough can comprise for example a collecting bag which is arranged on the base of the filter module.

5 The above-mentioned object is now achieved in a plant of the type mentioned at the outset in that it comprises a separating device with some or all of the above-mentioned features.

10 The advantages which can be achieved thereby correspond to the advantages explained above in relation to the separating device.

Exemplary embodiments of the invention are explained in more detail below with reference to the drawings, which show:

15 Figure 1 a paint booth of a surface treatment plant with a separating device for overspray in a front view;

Figure 2 a partial section through the paint booth of Figure 1, along the section line II-II shown therein, on an enlarged scale;

20 Figure 3 a perspective view of a filter module of the separating device, wherein part of a filter housing is shown broken away;

Figure 4 a perspective view corresponding to Figure 3 of a modified filter module;

5 Figure 5 a view corresponding to Figure 1 of a modified separating region of the paint booth on an enlarged scale;

Figure 6 a view corresponding to Figure 4 of a filter module which is again modified;

10 Figure 7 a side view of the filter module according to Figure 6, wherein a collecting trough is shown in section.

In Figure 1, 2 denotes a paint booth, as a whole, of a surface treatment plant in which vehicle bodies 4 are painted after they have been cleaned and degreased, for example, in the pre-treatment stations which are located 15 upstream in the paint booth 2 and are not shown specifically. The paint booth 2 rests on a steel construction 6 as is known per se.

20 The paint booth 2 comprises a paint tunnel 8, which is arranged at the top and is delimited by vertical side walls 10 and a horizontal booth ceiling 12, but is open at the end faces. Moreover, the paint tunnel 8 is open to the bottom in such a way that overspray-laden booth air can flow downwards. The booth ceiling 12 is constructed

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in conventional manner as a lower delimitation of an air supply chamber 14 with a filter cover 16.

Arranged above a lower opening 18 of the paint tunnel 8, there is a steel framework 20 which supports conveying 5 technology 22 which is known per se and is not discussed in more detail here. This can be used to transport vehicle bodies 4 to be painted from the entry side of the paint tunnel 8 to its exit side. Located inside the paint tunnel 8 are application devices in the form of multi- 10 axle application robots 24, which are known per se. The vehicle bodies 4 can be coated with paint by means of the application robots 24.

The lower opening 18 of the paint tunnel 8 is covered by an accessible grating 26. Located beneath the grating 26, 15 there is a plant region 28 in which the overspray particles entrained by the booth air are separated from the booth air.

Therefore, air flows out of the air supply chamber 14 downwards through the paint tunnel 8 to the plant region 20 28, whereby paint overspray which is present in the paint tunnel 8 is taken up and entrained by the air.

The plant region 28 comprises a flow region 30 into which the overspray-laden booth air flows first and which, to this end, is open at the top towards the paint booth 2, 25 but delimited at the side by the side walls 10 and at the

bottom by an intermediate ceiling 32. The intermediate ceiling 32 has a plurality of passages 34 arranged in succession in the longitudinal direction of the booth. Each of these passages 34 leads to a channel inlet 36 of 5 a respective air guide channel 38 into which the booth air which is laden with overspray particles firstly flows by and large vertically downwards.

The air guide channel 38 then deflects the booth air through 90° into the horizontal, whereupon it then flows 10 into a filter module 40 in a by and large horizontal direction. Each filter module 40 forms a separating unit which operates with a separating device denoted as a whole by 42, which is present in a separating region 44 of the paint booth 2 which is arranged below the flow 15 region 30.

Each filter module 40 is detachably connected to one of the air guide channels 38. To this end, each filter module 40 has a filter housing 46 with a filter inlet 48 which is constructed complementarily to a channel outlet 20 connection 50 of the air guide channel 38 so that the filter module 40 can be fluidically connected to, or disconnected from, the channel outlet connection 50 of the air guide channel 38 by a corresponding horizontal movement.

The separating device 42 in the present exemplary embodiment is therefore a separating filter which is assembled in modular fashion from the filter modules 40.

The booth air is deflected twice more through 90° in the 5 filter module 40, then flows through a filter unit in the form of an inertial filter 52 on which the paint overspray separates, and exits the filter module 40 through a filter outlet connection 54 on the same side of the filter housing 46 as that on which the filter inlet 10 48 is located. From there, the booth air, which is now substantially free of overspray particles, flows into an intermediate channel 56 by way of which it arrives in a collecting flow channel 58.

The intermediate channel 56 has an inlet flange 60, it 15 being possible for the filter outlet connection 54 of the filter module 40 to be fluidically connected to, or disconnected from, this inlet flange 60 through its horizontal movement described above. A filter module 40 is therefore ready for use in an operating position when 20 its filter inlet 48 is connected to the channel outlet connection 50 of the air guide channel 38 and its filter outlet connection 54 is connected to the inlet flange 60 of the intermediate channel 56.

The booth air is supplied for further treatment and 25 conditioning by way of the collecting flow channel 58 and is subsequently conducted in a circuit (not shown

specifically here) back into the air supply chamber 14 from which it flows back into the paint tunnel 8 from above. In the event that the booth air has not yet been adequately freed of overspray particles by the separating 5 filter 42, further filter stages can be provided downstream of the separating filter 42, to which the booth air is supplied and in which fleece filters or electrostatically operating separating filters are used, as are known per se. It is also optionally possible to 10 integrate one or more of such filter stages in the filter module 40. A filter fleece can therefore be arranged for example upstream of the filter outlet connection 54.

One of the filter modules 40 is now explained in more detail with reference to Figure 3. As can be seen 15 therein, the filter housing 46 of the filter module 40 delimits a flow chamber 62 which extends between the filter inlet 48 and the filter outlet connection 54 and through which the booth air flows on a flow path which is curved through 180°.

20 The filter housing 46 in turn comprises a base part 64 and a chamber cover 66 which is supported by the base part 64 and in which a chamber wall has the filter inlet 48 and the filter outlet connection 54. In terms of its geometry and its dimensions, the base part 64 is 25 constructed as a standardised supporting structure and for example in accordance with a with a so-called Euro pallet. It is thus possible for a filter module 40 to be

5 moved by a conveyor system 68 adapted to such standard structures and to be brought into, or removed from, its operating position. This is indicated in Figure 1 using the example of an elevating conveyor truck 70 which can be operated manually by an operator.

The arrangement of the filter modules 40 in the separating region 44 of the paint booth 2 can take place accordingly in grid formation, which rests on the standardised base part 64 used.

10 At least a lower collecting region of the filter module 40 is liquid-tight and therefore designed as a collecting trough 72 for paint which is separated at the inertial filter 52 and flows downwards therein.

15 The inertial filter 52 is arranged upstream of the filter outlet connection 54 in the flow chamber 62 in such a way that the overspray-laden booth air flows through it in a horizontal direction 74. The inertial filter 52 comprises a supporting structure 76 with a substantially horizontal supporting plate 78 - as shown in Figure 3, the
20 supporting plate 78 here is angled slightly downwards with respect to the horizontal in the flow direction of the booth air entering the filter module 40 - which is mounted inside on the housing wall of the filter housing 46 with the filter inlet 48 and the filter outlet
25 connection 54.

The supporting plate 78 supports a plurality of filter plates 80 which serve as separating elements and extend downwards in the direction of the collecting trough 72 and of which only a few are provided with a reference 5 numeral for the sake of clarity. As in the present exemplary embodiment, this can be implemented for example in such a way that the supporting plate 78 has slots 82 which are complementary to the filter plates 80 and in which the filter plates 80 are inserted. Of the slots 82, 10 again only a few have a reference numeral.

The filter plates 80 are V-shaped in cross-section and arranged such that the point of the V faces in the flow direction 74 of the air, in which the booth air flows through the inertial filter 52. The filter plates 80 here 15 are arranged offset from one another, with the number of filter plates 80 increasing in the flow direction 74 of the booth air. In other words, the spacing between the filter plates 80 decreases in the flow direction 74 and in a direction perpendicular thereto, i.e. in the 20 horizontal direction here. This principle is shown in Figure 2 for a replacement filter module 84 which is shown in vertical section and which will replace a fully-laden filter module 40.

In this way, a flow labyrinth, through which the booth 25 air flows and in which the overspray particles are separated at the filter plates 80 in a manner known per se in accordance with the principle of mass inertia, is

formed in the flow direction 74 in the inertial filter 52. From there, the overspray flows downwards into the collecting trough 72 where the overspray accumulates into a paint sump.

5 Instead of the filter plates 80, it is also possible to use separating elements which have a different construction in terms of their geometry and dimensions. Figure 4 shows a modified filter module 40 in which filter cartridges 86 are supported by the supporting 10 plate 78 of the supporting structure 76, instead of the filter plates 80. The filter cartridges 86 here are arranged according to the same principle as the filter plates 80 in the filter module 40 according to Figure 3. In practice, it is also possible to provide other 15 arrangements of the separating elements.

Instead of the filter plates 80 or filter cartridges 86, it is also possible to provide compartment structures or chamber structures as separating elements. Plates or sheets which are connected to one another in foldable or 20 plug-in manner can serve for example as compartment structures. In practice, chamber structures have a honeycomb-like design.

As can be seen in Figure 1, the filter module 40 rests on scales 88 in its operating position and is locked in its 25 operating position at the top and bottom by means of a locking device 90.

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Each filter module 40 is designed to hold a maximum quantity of paint, i.e. for an overspray loading limit which depends on the type of filter module 40 and the materials used for this. The quantity of paint which has 5 already been collected can be monitored by the scales 88. Alternatively, the loading limit can be established by determining the differential pressure. The air resistance built up by the filter module 40 increases as the filter module 40 becomes more loaded.

- 10 When a filter module 40 has reached its maximum holding capacity, the locking device 90 is released, the fully-laden filter module 40 is moved out of the separating region 44 of the paint booth 2 by means of the elevating conveyor 70 and replaced with an empty filter module 40.
- 15 To this end, the flow connection between the filter module 40 to be replaced and the guide channel 38 and the connecting channel 46 is interrupted in advance in that the channel outlet connection 50 of the guide channel 38 and the inlet flange 60 of the connecting channel 56 are 20 closed by means of a stop valve (not shown specifically).

When the empty filter module 40 is moved into its operating position on the scales 88, it is locked accordingly by the locking device 90 and therefore secured against being inadvertently moved out of the 25 separating region 44. The stop valves of the guide channel 38 and the connecting channel 56 are brought back

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into an open position so that the booth air flows through the newly positioned filter module 40.

The replaced overspray-laden filter module 40 is then supplied to a disposal and/or recycling process and 5 therefore used as a disposable filter module.

In other words, the filter modules 40 in which overspray is separated are therefore constructed as replaceable disposable units with a filter housing 46 and a filter unit 52, with each filter module 40 being replaced with 10 an empty filter module 40 after reaching an overspray loading limit.

Figure 5 shows a further modified conveyor system 68 as a variation. Instead of an elevating conveyor truck, this shows a roller conveyor system 92, which comprises roller 15 conveyors with motor-driven rollers in a manner known per se. By means of the roller conveyor system 92, filter modules 40 whereof the holding capacity for paint overspray is exhausted can be moved out of the separating region 44 of the paint booth 2 under computer control and 20 replaced with a respective unloaded filter module 40. To this end, the roller conveyor system 92 comprises cooperating conveyor units by means of which filter modules 40 can be moved parallel and/or transversely to the longitudinal extent of the paint booth 2.

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The base part 64, the chamber housing 66, the supporting structure 76 and the separating elements 80, 86 of the filter module 40 are made from a wet-strength recycling material. Generally speaking, one component, several 5 components or all the components of the filter module 40 are made from a wet-strength recycling material.

Cellulose materials, such as optionally treated paper and paperboard materials, corrugated cardboard, cardboards with vertical corrugations, cardboards with a honeycomb 10 structure or cardboard wrap as well as other materials, such as MDF materials, can be used for this. A wooden Euro pallet is suitable for example as the base part 64. Plastics, particularly such as polyethylene or polypropylene, are also possible.

15 The filter module 40 here can itself be delivered as a modular kit comprising the said components in individual parts and assembled on site. The chamber housing 66 here can have for example a collapsible ceiling and be folded along two diagonally opposed longitudinal edges into a 20 two-layer housing plate. The unfolded chamber housing 66 is then slipped for example over the inertial filter 52, which has been assembled in advance from the supporting structure 76 and the filter plates 80 or filter cartridges 86.

25 After the inertial filter 52 has then been mounted on the chamber housing 66, this structural unit is placed on the base part 64 and possibly secured thereto by adhesion.

To construct the collecting trough 72, a sealing mass can be injected into the base region and distributed uniformly in the base region of the flow chamber 62 using a nutating table.

5 Figures 6 and 7 show an alternative collecting trough 94 to this. Here, the base part 64 supports a rotating trough frame 96, which can likewise be made from one of the above-mentioned wet-strength recycling materials, for example from thin wooden blocks. A liquid-tight 10 collecting bag 98, in which the chamber housing 66 can be placed and whereof the upper edge is folded outwards over the trough frame 96, is inserted into the trough frame 96. It has been shown in practice that so-called Big-Bags 15 can be used as a collecting bag 98, which are known per se as packaging for example for powder paint.

The modular construction of the separating device 42 enables it to be of a compact design such that it can be arranged as an entire device within the inner contour of the paint booth 2, which is created by the steel 20 structure 6 in the present exemplary embodiments. This is clearly shown in Figure 1. In this way, the surface area required for the paint booth 2 is also not increased by the separating device 42. This enables ready-assembled 25 paint booths to be retrofitted with the separating device 42. This compactness of the separating device 42 as a whole is here based on the compactness of the individual filter modules 40.

Claims

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1. A method for separating overspray from the overspray-laden booth air of coating plants, in particular of painting plants, in which the overspray is taken up by an air stream and guided to a separating device (42) where a majority at least of the solid materials is separated from the overspray,

5 characterised in that

10 the overspray-laden booth air is conducted through filter modules (40) in which overspray is separated and which are constructed as replaceable disposable components with a filter housing (46) and a filter unit (52), wherein each filter module (40) is replaced with an empty filter module (40) after 15 reaching an overspray loading limit.

2. A method according to Claim 1, characterised in that a replaceable and overspray-laden filter module (40) is supplied to a disposal and/or recycling process.

20 3. A method according to Claim 1 or 2, characterised in that an inertial filter is used as the filter unit (52).

4. A device for separating overspray from the overspray-laden booth air of coating plants, in particular of painting plants,

characterised in that

5 a) the separating device (42) operates using filter modules (40) through which overspray-laden booth air can be conducted and in which overspray is separated;

10 b) the filter modules (40) are constructed as replaceable disposable units with a filter housing (46) and a filter unit (52);

15 c) the separating device (42) comprises means (38, 56, 68, 90) by which each filter module (40) is replaced with an empty filter module (40) after reaching an overspray loading limit.

5. A separating device according to Claim 4, characterised in that the filter unit (52) is constructed as an inertial filter.

6. A separating device according to Claim 5, characterised in that the filter unit (52) comprises a plurality of separating elements (80; 86) which are arranged so as to form a flow labyrinth.

7. A separating device according to Claim 5, characterised in that the separating elements (80; 86) extend vertically and have booth air flowing around them in the horizontal direction (74).
- 5 8. A separating device according to Claim 6 or 7, characterised in that the spacing between the separating elements (80; 86) decreases in the flow direction (74) and/or in a direction which is perpendicular to the flow direction (74).
- 10 9. A separating device according to one of Claims 6 to 8, characterised in that filter plates, filter cartridges, compartment structures or chamber structures are present as separating elements (80; 86).
- 15 10. A separating device according to one of Claims 4 to 9, characterised in that a filter module (40) comprises a base part (64) constructed as a standardised supporting structure.
- 20 11. A separating device according to one of Claims 4 to 10, characterised in that one component, several components or all the components of the filter module (40) are made from a wet-strength recycling material.

12. A separating device according to Claim 11, characterised in that one or more of the following materials is selected as a wet-strength recycling material: paper and paperboard materials, corrugated cardboard, cardboards with a vertical corrugation, cardboards with a honeycomb structure or cardboard wrap, MDF material, wood or plastic materials, in particular polyethylene or polypropylene.
5
- 10 13. A separating device according to one of Claims 4 to 12, characterised in that the filter module (40) is constructed as a modular kit.
- 15 14. A separating device according to one of Claims 4 to 13, characterised in that the filter module (40) comprises a collecting trough (72; 94) in which separated overspray collects.
- 20 15. A separating device according to Claim 14, characterised in that the collecting trough (94) comprises a collecting bag (98) which is arranged on the base of the filter module (40).
16. A plant for coating, in particular for painting, objects, in particular vehicle bodies, having
 - a) a coating booth (2), in which the objects (4) can be acted upon by coating material and

through which an air stream can be conducted, which takes up and carries away the overspray produced from the coating material;

5 b) a separating device (42) to which this booth air can be supplied and where a majority at least of the solid materials is separated from the overspray,

characterised in that

10 c) the separating device (42) is constructed according to one of Claims 4 to 15.

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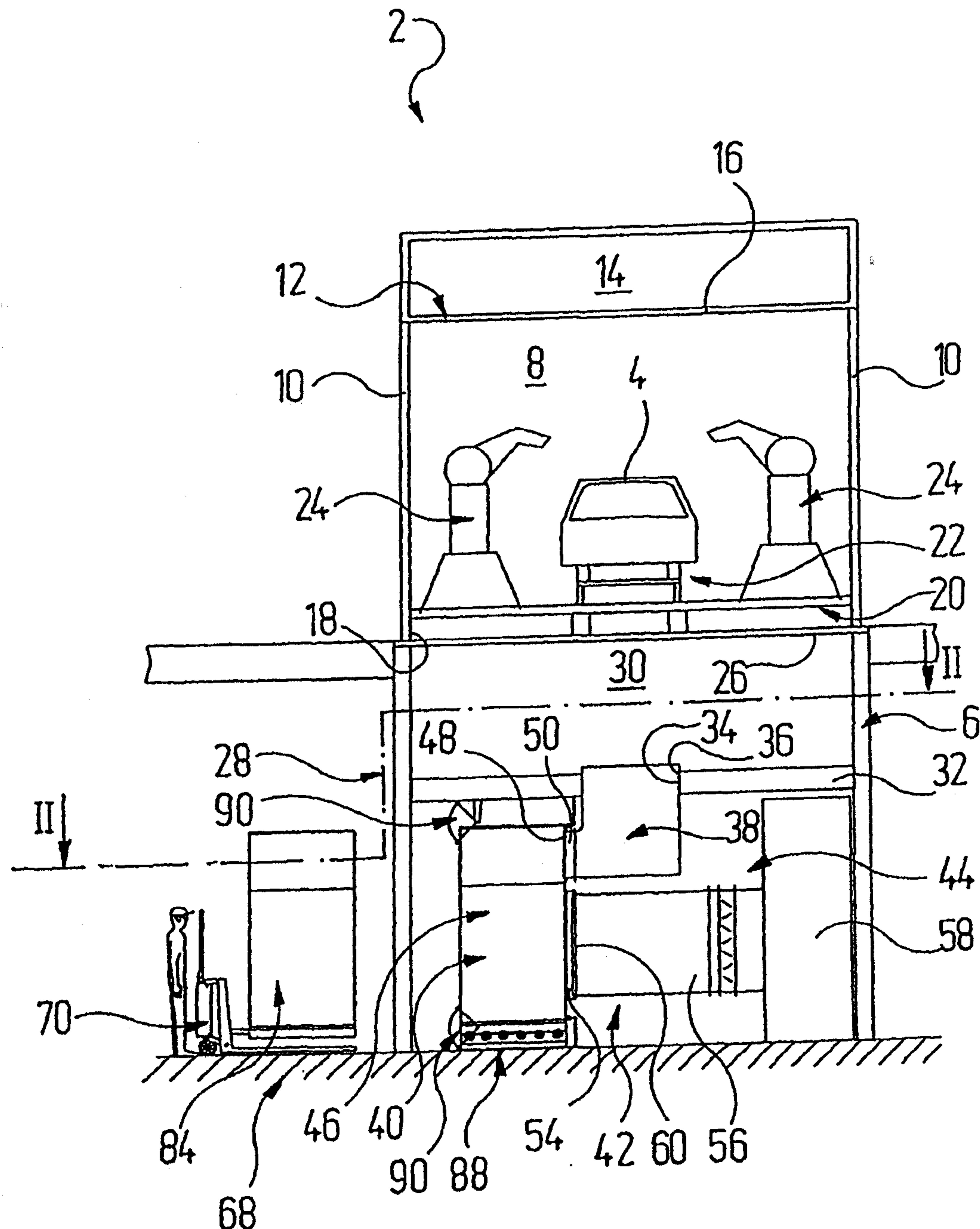
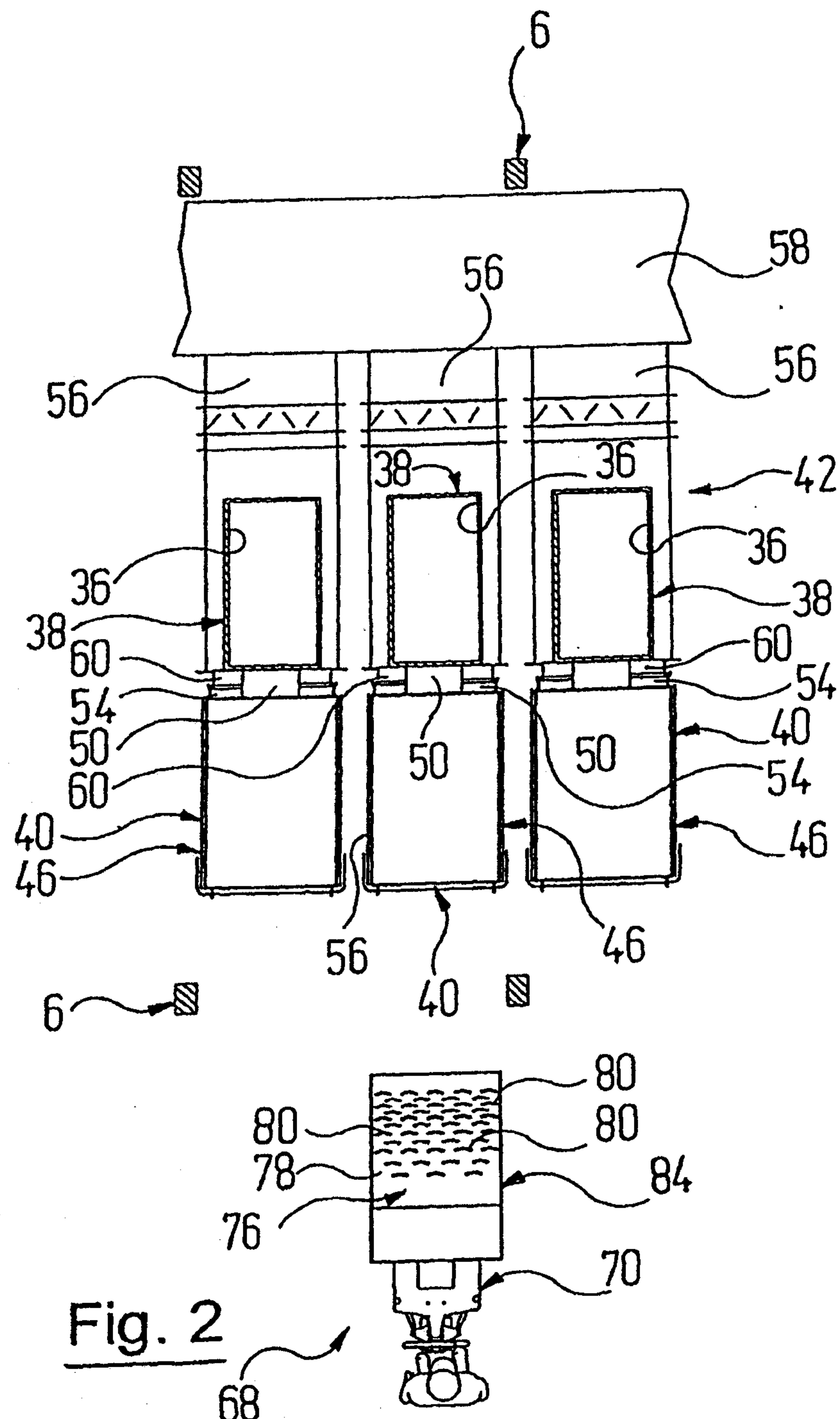


Fig. 1

REPLACEMENT SHEET (RULE 26)

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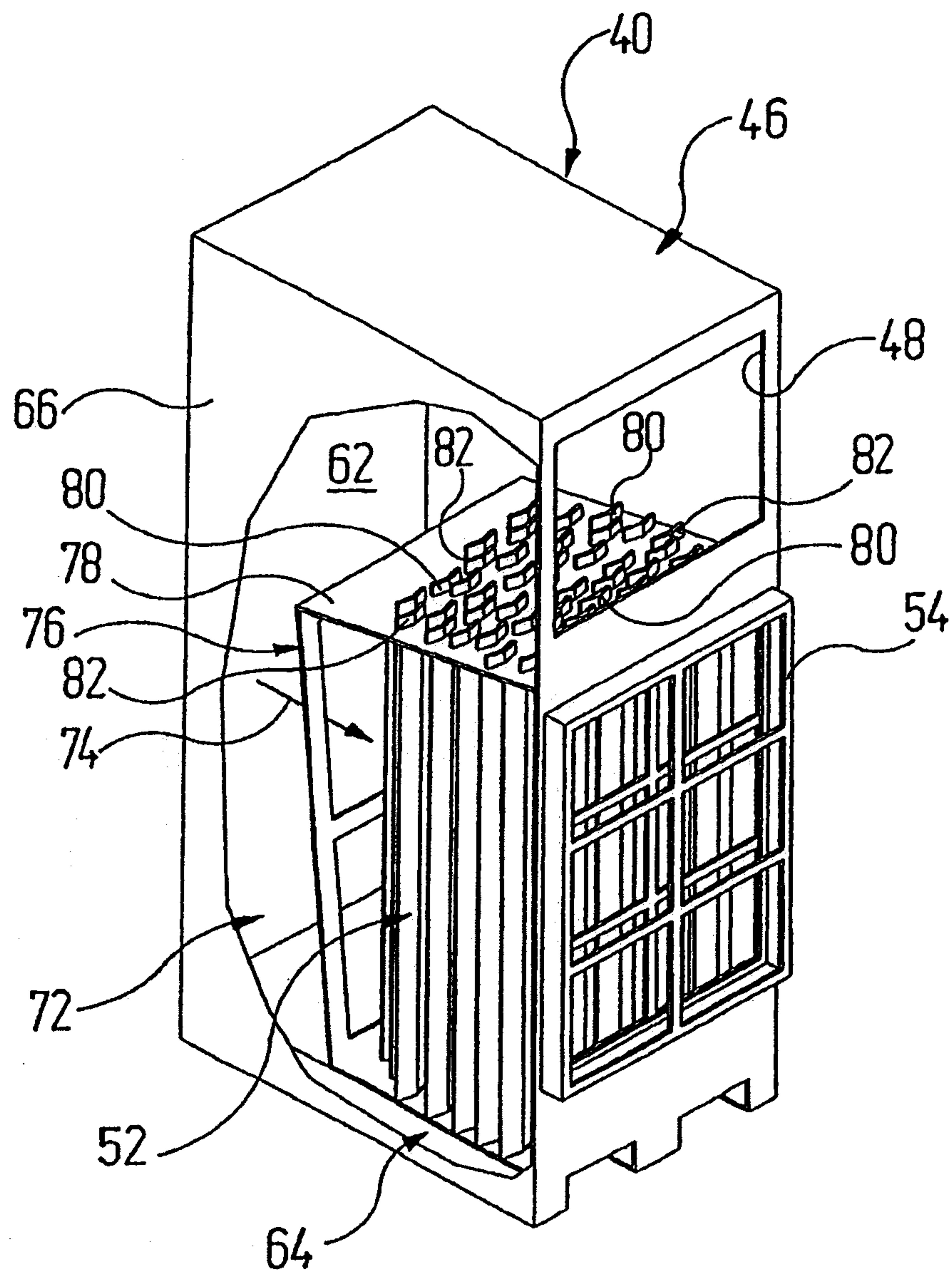


Fig. 3

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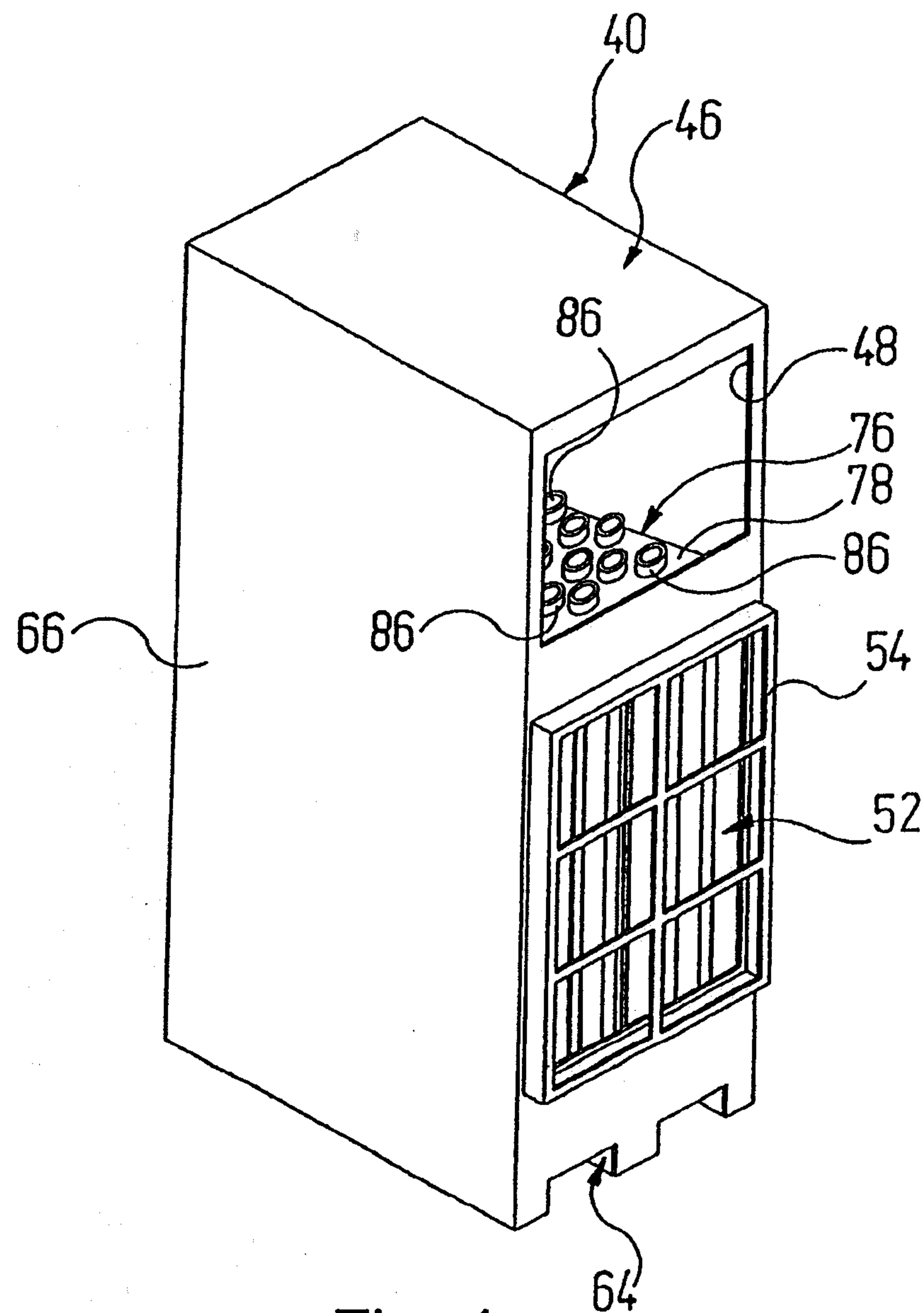
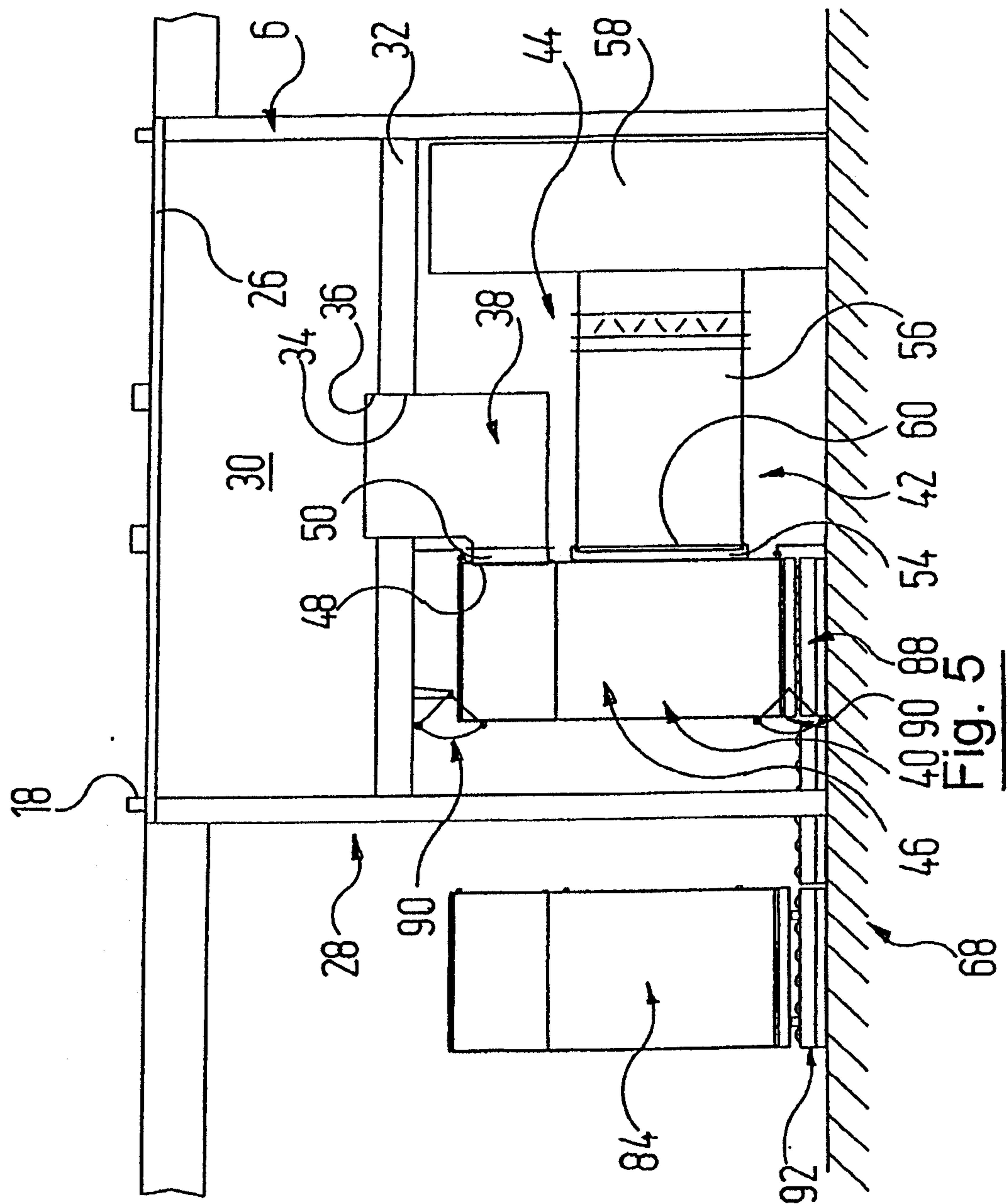


Fig. 4

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REPLACEMENT SHEET (RULE 26)

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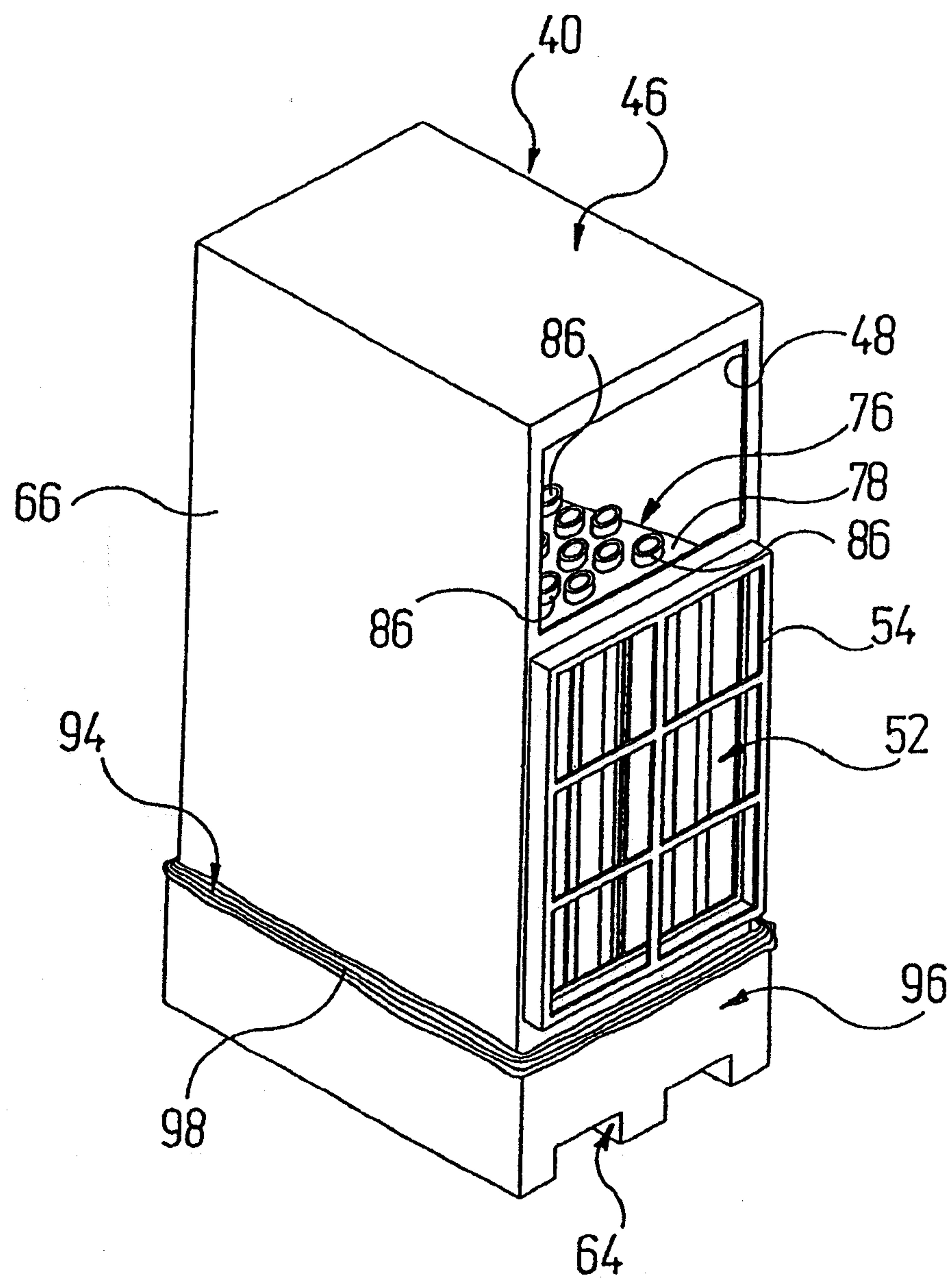


Fig. 6

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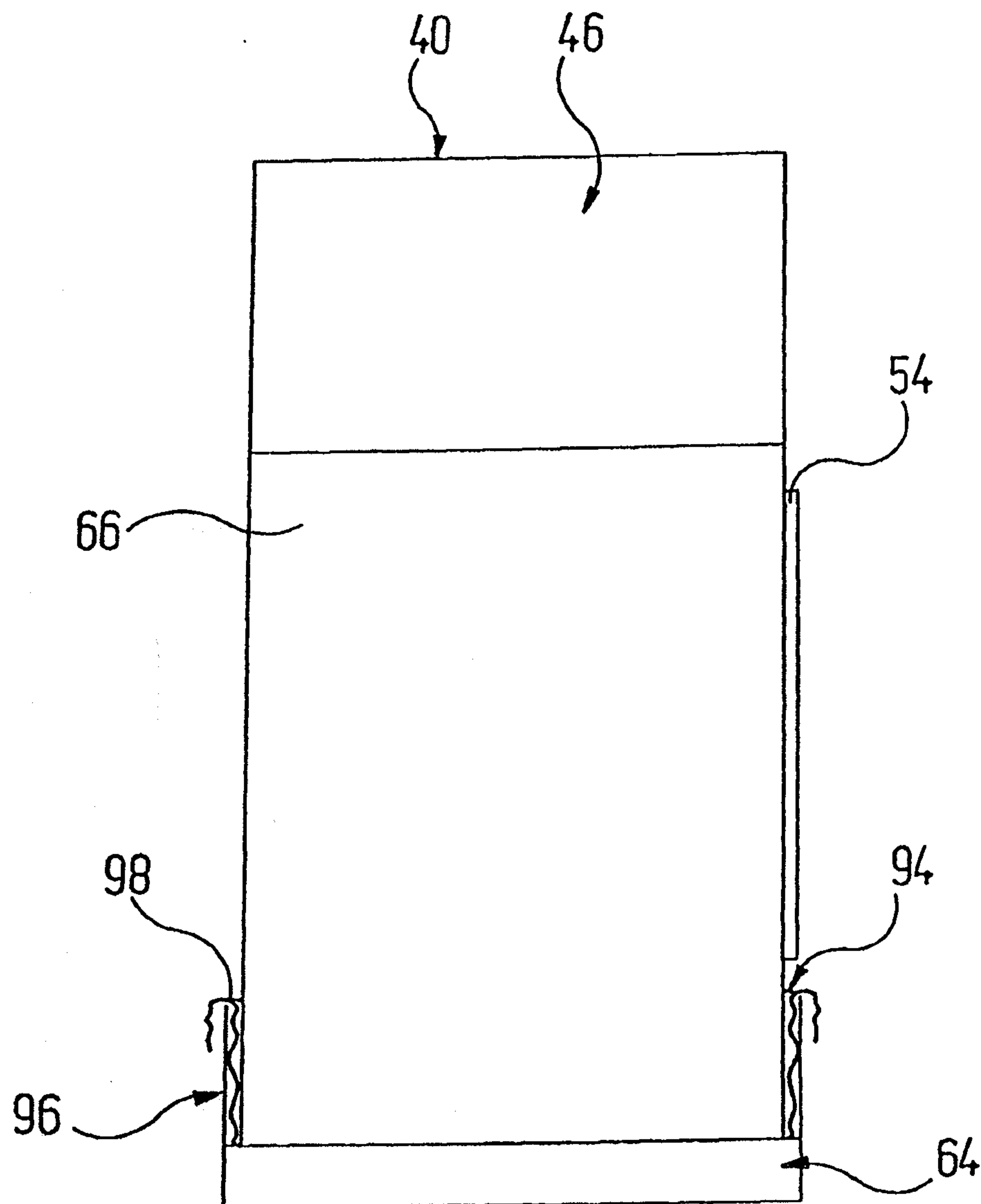


Fig. 7

Fig. 1

