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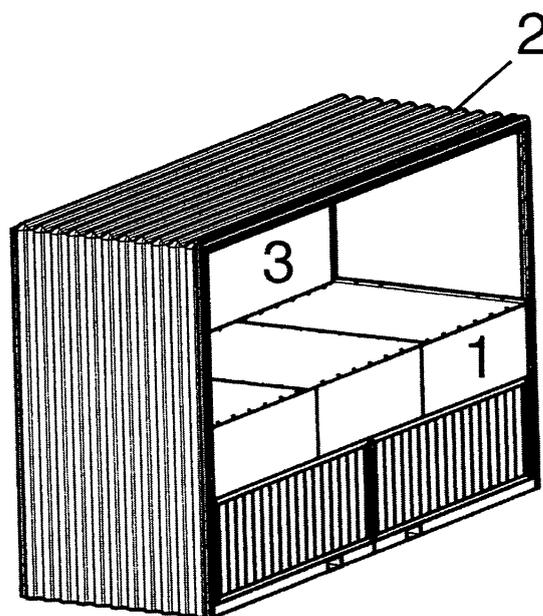
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(54) **Containment system for toxic agents deriving from varnishing processes, resin application and similar processes constituted by an extensible tunnel equipped with an aspiration and filtration system**

(57) A system of containment and extraction of toxic agents comprising an extensible tunnel and an extraction wall placed on one extremity of the tunnel in order to generate sufficient airflow inside of the tunnel to convey toxic agents towards the extraction wall and expel these outside the tunnel.

Fig. 1



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Description

[0001] During all of the varnishing processes in industry where an operator is involved, there exist problems of extraction of vapours of solvents dispersed in the air during the working process. Analogically, other working processes e.g. application of epoxidic resin give similar problems concerning solvents or substances resulting out of chemical processes. These problems actually are resolved in many cases by use of systems present on the market since long, but there are some situations where these solutions result inefficacious.

[0002] At the actual state of art the aspiration of vapours of solvents during varnishing is represented by varnishing cabins and, where these cannot be installed, by the so called extraction walls, sometimes equipped by roofing and lateral covering.

[0003] The varnishing cabin, in its typical form, has a parallelepiped basis on which the several preparation procedures and varnishing of pieces are done. The same cabin in many cases is equipped with heating, so as to have the function of a varnishing oven for drying up varnish or to catalyse the filler or resin.

[0004] The varnishing cabin has two great limitations that come out especially when the varnishing process is done sanctuary and not continuously, of pieces of greater dimensions and/or heavy. In this case, the user not only has to dispose of a big varnishing cabin that occupies permanently much space, but also has to cope with moving this piece with a crane or a bridge crane, or however modalities not compatible with a closed installation such as a varnishing cabin.

[0005] To avoid such problems, the so called "extraction walls" are being used, their main characteristic is to have a high aspiration surface. Extraction walls have been studied to convey vapours or toxic agents generated in proximity towards it.

[0006] This solution, in order to function, requires a very high capacity of aspiration, and however, the efficiency of this system is never too high. This provokes the dispersion of vapours of solvents outside of the zone in proximity of the extraction wall and thus it comes to indirect exposition to toxic agents of the other operators that are working inside the area where the extraction wall is placed.

[0007] Sometimes, to avoid this limitation, a not movable structure, constituted of two walls and a roofing is being placed next to the extraction wall, maintaining the side opposite to the extractor open.

[0008] This system enables to generate, inside the volume constituted by the fixed structure, the airflow that comes in from the open side towards the other one where the extractor is placed. This way the operator that normally operates inside the cabin facing the extractor, varnishes the piece spraying towards the extraction wall, has clean air entering inside the installation behind his back while the air polluted by solvents is being aspirated by the extraction wall situated in front of the operator,

with consequent better protection of the operator from toxic agents and limiting the quantity of solvents dispersed in the outside area surrounding the cabin, compared to the use of the extraction wall only.

[0009] However, also this solution presents analogue inconveniences, also if slightly minor, compared to the ones of varnishing cabins, concerning the positioning of objects of big dimensions and/or heavy.

[0010] In order to eliminate or minimize the problems mentioned, the proponent of the present application has proved the technical feasibility of the solution presenting a patent application for an invention for industry, presented contemporaneously with a utility model patent application.

[0011] This solution consists of an extraction wall combined with a sliding sectors structure that may be easily "closed", where the sectors superimpose one upon the other and, all together, superimpose the extraction wall, and "opened" where the same sectors cover a portion of the area in front of the extraction wall to be used for processes as varnishing or other.

[0012] This solution resolves the problems in an efficacious manner when the extension of the volume to be covered is moderate. In fact, the sectional and sliding structure to maintain the advantage of easy transportability, has to stay below a certain number of sliding elements. Otherwise, where larger areas have to be covered and above a certain number of sliding elements the cabin is no more easily transportable.

[0013] These and other inconveniences are resolved by use of the installation according to the present invention.

[0014] Substantially, according to the present invention, a structure based on a tunnel like covering, of the type as currently used for the protection from atmospheric agents during the operations of loading and unloading of trucks or for the realization of temporary storehouses, is being constructed, to which an aspiration system is being added that enables to generate airflow inside the volume of the tunnel.

[0015] This enables the application of the invention in analogue cases to the sector tunnel like extraction system without the dimensional limitations of that solution. In fact, the extensible tunnel occupies, when closed, generally, much less space than the sector sliding structure.

[0016] Furthermore, the technology used makes it possible to realize the tunnel of much greater dimensions maximally suitable for the varnishing process.

[0017] The aspiration system is to be installed on the side of the tunnel that is not to be extended. The extensible parts of the tunnel may be used to support a hose line or other accessories with the function to increase the air flow generated inside the tunnel.

[0018] One possible technical solution, illustrated on drawings 1 and 2, is the realization of the extensible tunnel starting from the side where the extraction walls is placed, where the wall behind the extractor does not participate on the extension and may be made of cloth, plas-

tic or metallic material, the construction material not outranging the invention. On the inside of this wall, or on the side from where the tunnel is going to be extended, the extraction wall is to be installed. The extraction wall conveys the air flow aspirated and filtrated out by means of suitable openings inside the fixed wall behind it, or eventually by means of pipes that may convey the airflow expelled.

[0019] This system as described and represented, with the tunnel closed, see drawing nr. 1 where indicated as nr. (1) there is the aspiration wall, as nr. (2) there is the tunnel covering closed and as nr. (3) the part of the wall behind that does not participate on the extension.

[0020] On drawing nr. 2 there is the same system as in drawing nr. 1 with the tunnel open (extended). In particular, indicated as nr. (4), as if it was transparent, the tunnel covering that when extended, forms a tunnel inside of which the airflow is generated.

[0021] On drawing nr. 3 there is an illustration of possible application of accessories of the aspiration system for extraction of toxic vapours. In particular, indicated as nr. (5) there is a sub- aspiration system localized in some areas inside the tunnel and as nr. (6) and nr. (7) a ventilation system, consisting, in this case, of two ventilators, that convey the air from outside inside the tunnel in order to maintain the airflow necessary to extract the toxic agents present produced by the working process.

[0022] The dimensions of the system are not a limitation to the invention described, so as the material used for the realization of the structure and the covering of the tunnel.

[0023] This system in its configuration as described and, however, according to the invention, brings several advantages that are not present at the moment and at the actual state of the art, in any equipment present on the market.

[0024] In particular, it is going to be possible to have a high aspiration efficiency of the extraction system with inferior dimensions when not in use and closed, as well as it is going to be possible to move the pieces to varnish without the covering encumbering, simply positioning the piece to varnish in the processing area that is going to be covered then by the tunnel extended.

[0025] The same system may be used, with appropriate characteristics of the extraction wall also for the aspiration of powder and dust produced by the processes of sandpapering and however in all of the occasions that may occur analogically to varnishing and resin application, resolving the problems of encumber and the mobility of the pieces to process as described above.

2. A system of containment of toxic agents constituted by an extensible tunnel equipped with an extraction system that covers entirely or partially one extremity of the tunnel, able to generate airflow along the inside of the tunnel.
3. A system of containment of toxic agents constituted by an extensible tunnel equipped with an extraction system that covers entirely or partially one extremity of the tunnel, able to generate airflow along the inside of the tunnel, equipped with accessories with a localized system of air extraction.
4. A system of containment of toxic agents constituted by an extensible tunnel equipped with an extraction system that covers entirely or partially one extremity of the tunnel, able to generate airflow along the inside of the tunnel, equipped with accessories and a system of air intake ventilation placed on the opposite extremity of the tunnel.
5. A system of containment of toxic agents constituted by an extensible tunnel equipped with an extraction system that covers entirely or partially one extremity of the tunnel, able to generate airflow along the inside of the tunnel, equipped with accessories with a localized system of air extraction and a system of air intake ventilation placed on the opposite extremity of the tunnel.
6. A system of containment of toxic agents as described in claims 1,2,3,4, and/or 5 for application in shipbuilding industry.

Claims

1. A system of containment of toxic agents constituted by an extensible tunnel equipped with an extraction system able to generate airflow along the inside of the tunnel.

Fig. 1

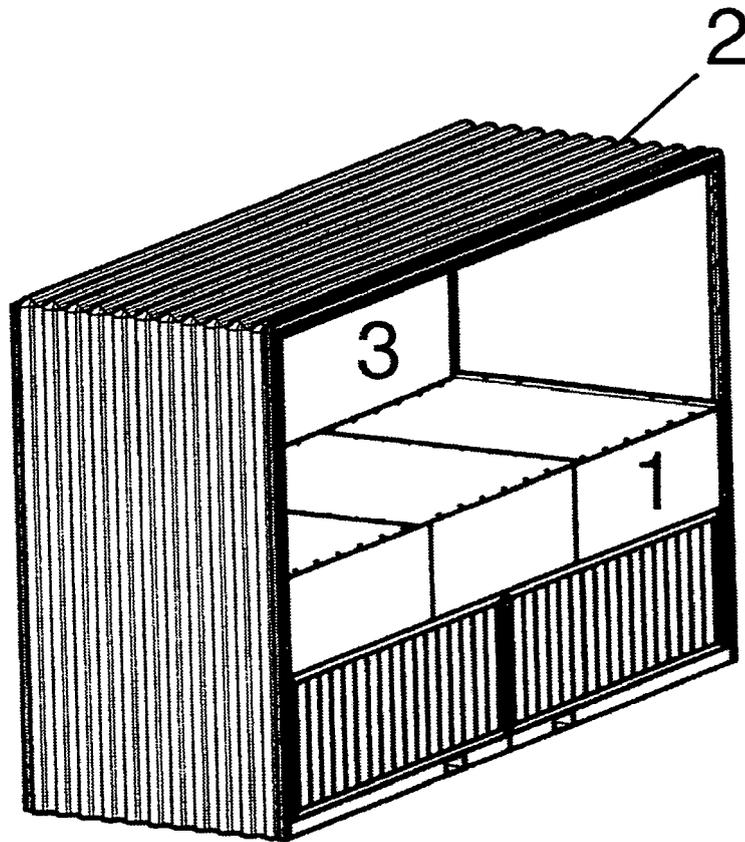


Fig. 2

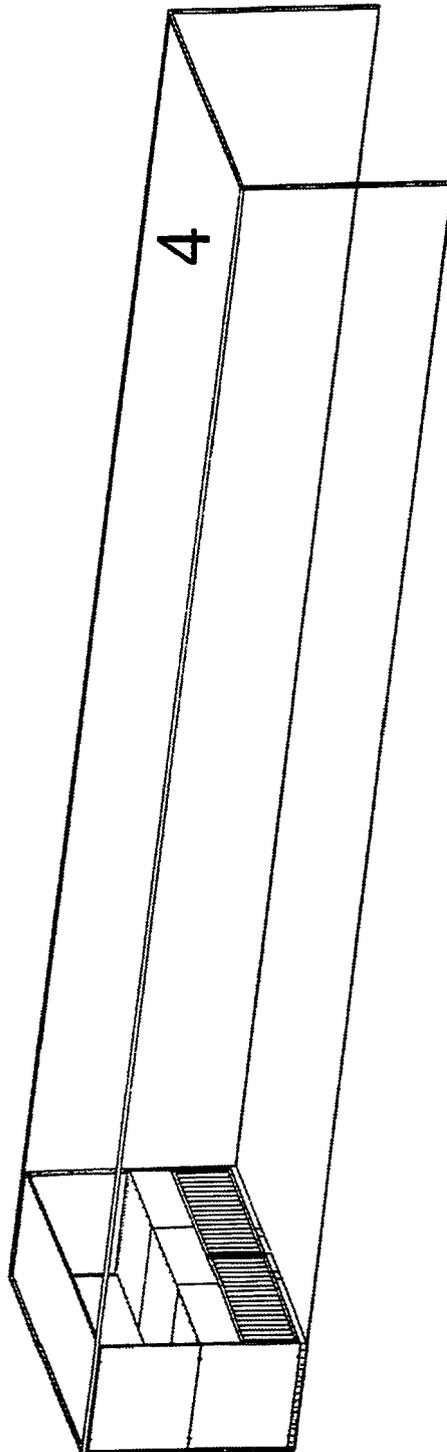
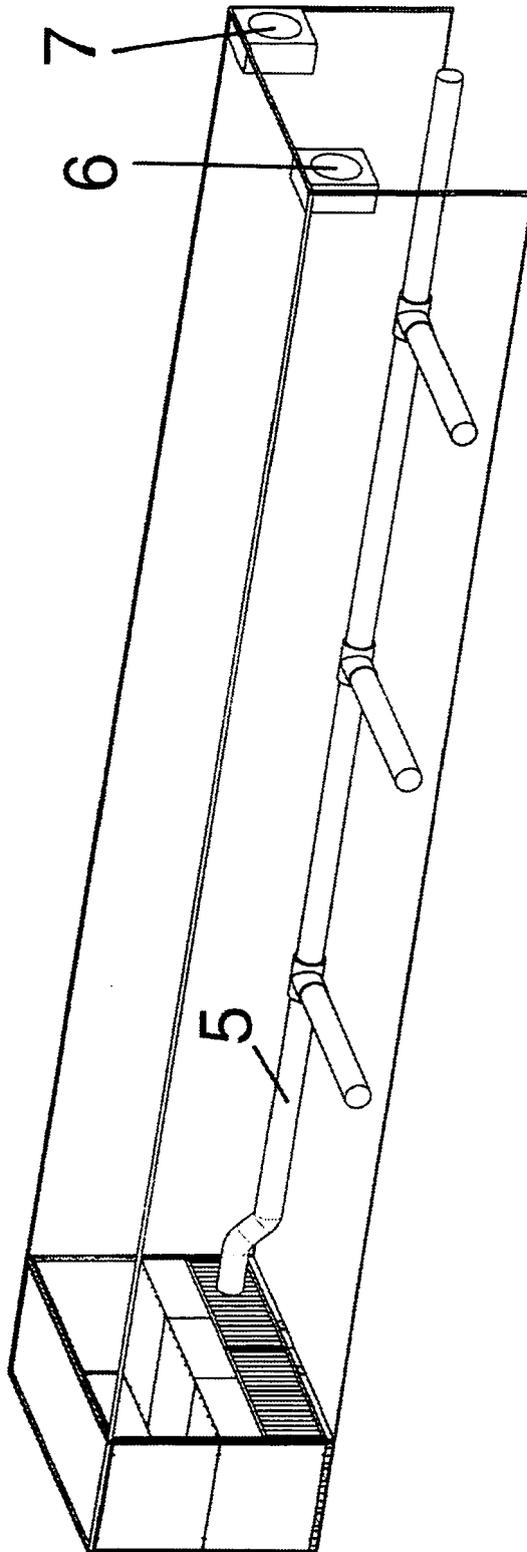


Fig. 3





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3	Place of search Munich	Date of completion of the search 5 March 2008	Examiner Hoyal, Barnaby
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 & : member of the same patent family, corresponding document	
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			

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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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