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(54) **Outdoor fire fighting module**

Aussenmodul für Brandbekämpfung

Module d'exterieur pour la lutte contre des incendies

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(56) References cited:
WO-A-2008/109023
DE-A1- 10 124 518
DE-A1- 10 337 469
DE-U1- 20 111 753
FR-A- 2 859 637
US-A- 4 992 669

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Description

[0001] The present invention relates to an outdoor fire fighting module or apparatus.

[0002] In particular, the invention in question can advantageously be applied to produce fire fighting procedures or systems for buildings in general, such as commercial, manufacturing, residential structures and the like, to which the description below will refer explicitly without loss of generality, in full compliance with the current European regulations on the subject of safety and guaranteed efficacy.

[0003] Currently, the structural configuration of the most common and widely used systems for producing fire fighting systems by means of water supply are provided in general with cistern containers of specific capacity, positioned buried in areas in proximity to buildings and suitable to define relative tanks containing water to be drawn and sprayed onto these buildings in the event of a fire by means of respective pumping units arranged in relative rooms provided adjacent to each cistern under the ground.

[0004] A fire fighting apparatus structure of this kind currently has serious and noteworthy problems and drawbacks.

[0005] The most serious and obvious problem is due to the buried position, up to a few meters below ground level, of said cistern tanks so that there is a very high risk of flooding of the entire buried structure, due to accidental leakages from the tanks or through manholes for access from the outside, or caused by infiltrations in the ground, which can seriously compromise the efficacy and operation of the pumping unit and consequently the efficiency of the fire fighting system. A further disadvantage is caused by the formation of condensate due to inadequate ventilation.

[0006] There are also considerable problems related to difficult access to perform periodic maintenance operations on the aforesaid pumping units.

[0007] The danger of flooding or, in any case, of serious damage by corrosion of the entire structure or of parts thereof remains high even when a structure of this kind is provided with specific drainage devices which can be operated automatically by and through specific detectors, in turn at risk of flooding although housed in specific compartments separate from the compartments housing the pumping units.

[0008] Due to the considerable dimensions of cistern tanks, currently known apparatus structures are also very bulky and complex to transport to the installation site, for example with special transport vehicles, and naturally require very large excavation areas in proximity to the building sites, and crane lifting structures of considerable dimensions and capacities to allow the cistern tanks to be positioned in the site.

[0009] Finally, it must be mentioned that an apparatus structure as described above seriously fails to comply with current regulations, according to the latest recent amendments, for example in relation to minimum heights, to the strictly established air spaces and to the dimensions of the access areas for personnel in charge of maintenance, in particular for the operation and efficacy of the aforesaid pumping units.

[0010] According to prior art documents DE 20111753 U1, WO 2008/109023 A1 and DE 10124518 U1, it's known an outdoor fire fighting apparatus comprising a module or room with delimited space and formed by a structure with load-bearing covering frame for fire fighting components, the structure is adapted to be positioned at the level of the ground; the components positioned inside the structure of said module comprising at least pump pressure booster means to draw water or other suitable liquid from an outdoor tank or cistern and spray it onto buildings in the event of a fire. The cited structure is provided with substantially fully openable lateral surfaces.

[0011] The object of the present invention is to overcome the serious drawbacks of prior art described above.

[0012] In particular, an object of the present invention is to produce a fire fighting apparatus which has a modular structure, is easily transported and installed on the ground outside buildings in general.

[0013] Another object of the present invention is to produce a fire fighting apparatus that is not subject to flooding or similar phenomena of infiltration that compromise its efficacy.

[0014] A further object of the present invention is to produce a fire fighting apparatus capable of operating efficiently, with the possibility of extremely rapid maintenance operations and easily performed in total safety.

[0015] Yet another object of the present invention is to produce a fire fighting apparatus capable of fully complying with the current regulations on safety and guaranteed efficacy.

[0016] According to the present invention, there is provided an outdoor fire fighting apparatus according to claim 1.

[0017] The technical features of the invention, according to the aforesaid objects, are clearly seen from the content of the claims below, and the advantages thereof will be more apparent from the detailed description below made with reference to the accompanying figures which schematically show a preferred but non-limiting embodiment of the apparatus in question, wherein:

- Fig. 1 is a front view, partly sectional and with some parts remove for clarity, of the fire fighting apparatus in question; and
- Fig. 2 represents, in a front view, a detail of the construction of the apparatus of Fig. 1.

[0018] With reference to the accompanying figures, the reference numeral 100 indicates as a whole an apparatus for performing fire fighting procedures or systems for buildings in general, such as, preferably but without limitation, commercial, manufacturing, residential structures and the like.

[0019] The apparatus 100 comprises a preassembled module 101 defining a substantially closed room or delimited space formed by a parallelepiped load bearing structure or covering frame 102 or box positioned and fastened to, and at the level of, the ground G in proximity to a building (not shown), and comprising therein operational fire fighting components, better specified hereunder, and controlled by known electric drive and control means indicated with 7; in the event of a fire, the module 101 is adapted to retain its stability for a period of time equivalent to 60 minutes (R60).

[0020] According to what is illustrated in detail in Fig. 1, inside the module 101 is a pressure booster unit 6, fastened to the floor PT of the module 101, and comprising pump means 6a adapted to draw water or other suitable liquid from a tank or cistern C below through a draw pipe T and to spray it (in a known manner, not shown) onto the external buildings in the event of a fire.

[0021] The pressure booster unit 6 is of the motorized thrust unit type, preferably, but without limitation, mechanical (preferably diesel motor), and also substantially comprises:

- a fuel reservoir 4 connected to the tank 3,
- means 14 for venting to the outside,
  and, where required,
- a fuel loading pump 12 adapted to draw the fuel used by the means 6a from a tank 3 provided with ducts 15 for venting to the outside,
- a priming or loading tank 2, with the function of guaranteeing filling of the pumps and of the relative suction pipes also in the event of leakages caused by malfunction of base valves (known and not shown).

[0022] According to an alternative variant, not shown, the pump means 6a comprise a thrust unit with three-phase electric motor.

[0023] The pressure booster unit 6 is also connected through ducts to appropriate spray or sprinkler means 19 adapted to spray water or other suitable liquid inside this module 101 in the event of a fire.

[0024] Also provided mounted inside the module 101, specifically on the rear frontal wall P1 of the structure 102 according to the diagram of Fig. 1, is a uninterruptible power supply 11 adapted to allow activation and operation for 6 hours also in the event of an accidental power cut, of a specific electric fan 1 mounted preferably on a lateral wall P2 of the load bearing structure 102, while an inlet grille 10 draws air from outside.

[0025] Also provided inside the module 101 are a heat blower 5 adapted to maintain the temperature inside the module 101 within a technically correct range and which complies with the provisions of the specific regulations, a service light source 8, appropriately fixed to the ceiling wall PS of the structure 102, an emergency light source 9, and extinguisher means 13 preferably fixed to a lateral wall P3 of the structure 102.

[0026] The structure 102 is of the substantially openable type: according to what is illustrated in the preferred but non-limiting embodiment of Fig. 2, at least the front frontal wall P4 of the structure 102 of the module 101 is in fact provided with frontal opening means 17 of the module 101, which comprise doors 17 (four in Fig. 2) appropriately hinged in points of the structure 102 and adapted to be easily and rapidly opened. The doors 17 are also provided with safety padlock closing means (not shown in Fig. 2).

[0027] In particular, the opening doors 17 not only allow easy, wide and rapid access to the inside of the module 101 and to all the components positioned therein in the event of maintenance, but above all allow air to flow into the module 101, ensuring full compliance with the recently amended current European safety regulations. More specifically, the regulations to which explicit and direct reference is made are those indicated with *UNI 11292 and EN 12845.*

[0028] According to the principles established by the aforesaid regulation *UNI 11292,* this expressly requires ample and easy access to rooms containing components for fire fighting systems, also to allow optimum ventilation: therefore, the possibility of being able to open substantially the whole module 101 through the doors 17, allowing ample and widely ventilated access, makes the present invention an ideal solution in accordance with these principle regulations. An appropriate horizontal covering 20 is also present, produced as an extension of the outer roof PS of the module 101 to allow safe action on the control panels 7 also in the event of rain. Again to comply with the aforesaid regulation *UNI 11292* of 2008, in particular with reference to the minimum dimensions established by this regulation, the module 101 defining a delimited space as mentioned above is therefore produced with a minimum internal height of 2.4 meters, and with ample and free accessibility, from all four openable sides of the module 101, to the pressure booster unit 6 positioned inside the module 101 of no less than 0.80 meters; while the length of the module 101 is preferably supplied with modules of dimensions equivalent to 2, 3 or 4 meters and multiples thereof. Moreover, as established by this regulation, the aforesaid electric fan 1 is powered automatically for 6 hours even in the absence of power by the uninterruptible power supply 11.

[0029] It must be mentioned that the module 101 defining said room is easily transported, as it does not require special vehicles to be transported to the site, also due to its relatively limited weight, as it is produced in appropriate light material, and is rapid to install and set-up, through connection to the water system and to the electricity mains.

[0030] In substance, the apparatus 100 must be considered a system with a light and mobile structure, easily transported and positioned, but for operation and use in a permanent site and incorporated in a stable fire fighting system; together with the aforesaid cistern C and relative connection pipes and the like, it therefore defines a fire fighting system of fixed type.

[0031] Moreover, the module 101 is not subject to flooding, as it is fixed at the level of the ground and not buried as instead prior art solutions are, and finally it allows simple and rapid maintenance operations on each component provided inside, such as supplying the fuel required for operation of the pressure booster unit 6.

[0032] It must also be pointed out how the apparatus described above is automatically activated in the event of a fire, and therefore does not require the permanent presence of operators to start it. In fact, in the event of a fire, the heat released by the flames causes activation of the aforesaid spray or sprinkler means (through the breakage of specific glass bulbs of these sprinkler means) or, alternatively of nozzles or hoses (known and not shown), resulting in a sharp drop in pressure in the pipes of the hydraulic system which starts up the aforesaid pump means.

[0033] The invention thus conceived can be subject to numerous modifications and variants all falling within the scope of the inventive concept; moreover, all details can be substituted by technically equivalent elements.

Claims

1. An outdoor fire fighting apparatus (100), comprising a module (101) or room with delimited space and formed by a mobile structure (102) with load-bearing covering frame for fire fighting components (1,2,3,4,5,6,6a,7,8,9,10,11,12,13), said structure (102) being adapted to be positioned and fastened at the level of the ground (G); said components (1,2,3,4,5,6,6a,7,8,9,10,11,12,13) positioned inside said structure (102) of said module (101) comprising at least pump pressure booster means (6,6a) and a hydraulic system to draw water or other suitable liquid from an outdoor tank or cistern (C) and spray it onto buildings in the event of a fire; said structure (102) being provided with substantially fully openable lateral surfaces; said pressure booster means (6, 6a) being activated automatically following a drop in pressure occurring in the pipes of said hydraulic system **characterized in that** said fire fighting components (1,2,3,4,5,6,6a,7,8,9,10,11,12,13) also comprise spray or sprinkler means (19) connected via the pipes of said hydraulic system to said pressure booster means (6, 6a) to spray water inside said structure (102) in the event of a fire

2. The fire fighting apparatus according to claim 1, **characterized in that** said pressure booster means (6a) are of the thrust unit type with mechanical motor and comprise means (14, 15) for venting fumes to the outside and, when required, fuel loading means (12) adapted to draw fuel from tank means (3,4).

3. The fire fighting apparatus according to any one of claims 1 to 2, **characterized in that** said fire fighting components (1,2,3,4,5,6,6a,7,8,9,10,11,12,13) also comprise means (7) for electric drive and control of said pressure booster means (6, 6a); uninterruptible power means (11) adapted to permanently guarantee activation and operation of said pressure booster means (6, 6a); fan means (1) and grille means (10) adapted to allow entry of air from outside; service and emergency lighting means (8,9); extinguisher means (13); and covering means (20) to allow safe access to said drive means (7) also in the event of rain.

4. The fire fighting apparatus according to any one of claims 1 to 3, **characterized in that** said module (101) has a minimum internal height of 2.4 meters, and has free accessibility on the four sides of said pressure booster means (6, 6a) with dimension of no less than 0.80 meters, in accordance with the current regulations UNI 11292 and EN 12845; in the event of a fire, said module (101) retaining its stability for a period of time equivalent to 60 minutes.

Patentansprüche

1. Außen-Brandbekämpfungsvorrichtung (100), mit einem Modul (101) oder Raum mit abgegrenztem Platzangebot, das/der durch einen mobilen Aufbau (102) mit einem Last tragenden Abdeckrahmen für Brandbekämpfungskomponenten (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) geformt ist, wobei der Aufbau (102) derart angepasst ist, dass er auf dem Niveau des Bodens (G) positioniert und befestigt werden kann; wobei die Komponenten (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13), die in dem Aufbau (102) des Moduls (101) positioniert sind, zumindest ein Pumpdruckverstärkungsmittel (6, 6a) und ein Hydrauliksystem umfassen, um Wasser oder eine andere geeignete Flüssigkeit von einem Außentank oder einer Zisterne (C) zu ziehen und diese auf Gebäude in dem Fall eines Brandes zu spritzen; wobei der Aufbau (102) mit im Wesentlichen vollständig öffenbaren Seitenflächen versehen ist; wobei das Druckverstärkungsmittel (6, 6a) automatisch nach einem Abfall des Drucks, der in den Rohren des Hydrauliksystems auftritt, aktiviert wird,
dadurch gekennzeichnet, dass
die Brandbekämpfungskomponenten (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) auch ein Spritz- oder Sprinkler-Mittel (19) umfassen, das über die Rohre des Hydrauliksystems mit dem Druckverstärkungsmittel (6, 6a) verbunden ist, um Wasser in den Aufbau (102) in dem Fall eines Brandes zu spritzen.

2. Brandbekämpfungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass**
das Druckverstärkungsmittel (6a) vom Typ einer Schubeinheit mit mechanischem Motor ist und ein

Mittel (14, 15) zum Entlüften von Rauch an die Außenseite und nach Bedarf ein Kraftstoffmittel (12) umfasst, das derart angepasst ist, Kraftstoff von dem Tankmittel (3, 4) zu ziehen.

3. Brandbekämpfungsvorrichtung nach einem der Ansprüche 1 oder 2,
dadurch gekennzeichnet, dass
die Brandbekämpfungskomponenten (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) auch ein Mittel (7) zum elektrischen Antrieb und zur Steuerung des Druckverstärkungsmittels (6, 6a); ein unterbrechungsfreies Strommittel (11), das derart angepasst ist, eine Aktivierung und einen Betrieb des Druckverstärkungsmittels (6, 6a) dauerhaft zu garantieren; ein Gebläsemittel (1) und ein Gittermittel (10), das derart angepasst ist, um einen Eintritt von Luft von der Außenseite zuzulassen; ein Wartungs- und Notfallbeleuchtungsmittel (8, 9); ein Löschmittel (13); und ein Abdeckmittel (20) umfassen, um einen sicheren Zugang zu dem Antriebsmittel (7) auch in dem Fall von Regen zuzulassen.

4. Brandbekämpfungsvorrichtung nach einem der Ansprüche 1 bis 3,
dadurch gekennzeichnet, dass
das Modul (101) eine minimale Innenhöhe von 2,4 Metern besitzt und eine freie Zugänglichkeit an den vier Seiten des Druckverstärkungsmittels (6, 6a) mit Abmessungen von nicht weniger als 0,80 Metern gemäß den gegenwärtigen Regulierungen UNI 11292 und EN 12845 besitzt; wobei das Modul (101) in dem Fall eines Brandes seine Stabilität für eine Zeitdauer von gleich 60 Minuten beibehält.

Revendications

1. Appareil d'extérieur de lutte contre l'incendie (100), comprenant un module (101) ou chambre avec un espace délimité et formé par une structure mobile (102) avec un cadre couvrant porteur pour les composants de lutte contre l'incendie (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13), ladite structure (102) étant adaptée pour être positionnée et fixée au niveau du sol (G) ; lesdits composants (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) étant positionnés à l'intérieur de ladite structure (102) dudit module (101) comprenant au moins des moyens de surpresseur de pompe (6, 6a) et un système hydraulique pour aspirer de l'eau ou un autre liquide adapté depuis un réservoir ou une citerne extérieur(e) (C) et la pulvériser sur des bâtiments en cas d'incendie ; ladite structure (102) étant dotée de surfaces latérales sensiblement entièrement ouvrables ; lesdits moyens de surpresseur (6, 6a) étant activés automatiquement à la suite d'une chute de pression ayant lieu dans les tuyaux dudit système hydraulique, **caractérisé en ce que** lesdits composants de lutte contre l'incendie (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) comprennent également un moyen de pulvérisateur ou de gicleur (19) raccordé via les tuyaux dudit système hydraulique auxdits moyens de surpresseur (6, 6a) pour pulvériser de l'eau à l'intérieur de ladite structure (120) en cas d'incendie.

2. Appareil de lutte contre l'incendie selon la revendication 1, **caractérisé en ce que** lesdits moyens de surpresseur (6a) sont de type à unité de poussée avec un moteur mécanique et comprennent des moyens (14, 15) pour évacuer la fumée à l'extérieur et, si nécessaire, un moyen de chargement de carburant (12) adapté pour aspirer du carburant depuis les moyens de réservoir (3, 4).

3. Appareil de lutte contre l'incendie selon l'une quelconque des revendications 1 à 2, **caractérisé en ce que** lesdits composants de lutte contre l'incendie (1, 2, 3, 4, 5, 6, 6a, 7, 8, 9, 10, 11, 12, 13) comprennent également un moyen (7) pour l'entraînement électrique et la commande desdits moyens de surpresseur (6, 6a) ; un moyen d'alimentation sans coupure (11) adapté pour assurer en permanence l'activation et le fonctionnement desdits moyens de surpresseur (6, 6a) ; un moyen de ventilateur (1) et un moyen de grille (10) adapté pour permettre l'entrée d'air depuis l'extérieur ; des moyens d'éclairage d'urgence et d'entretien (8, 9) ; un moyen d'extincteur (13) ; et un moyen de couverture (20) pour permettre un accès sans risque audit moyen d'entraînement (7) également en cas de pluie.

4. Appareil de lutte contre l'incendie selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** ledit module (101) a une hauteur interne minimale de 2,4 mètres, et a une accessibilité libre sur les quatre côtés desdits moyens de surpresseur (6, 6a) avec une dimension de pas moins de 0,80 mètre, en conformité avec les normes UNI 11292 et EN 12845 ; en cas d'incendie, ledit module (101) maintenant sa stabilité pendant une période équivalente à 60 minutes.

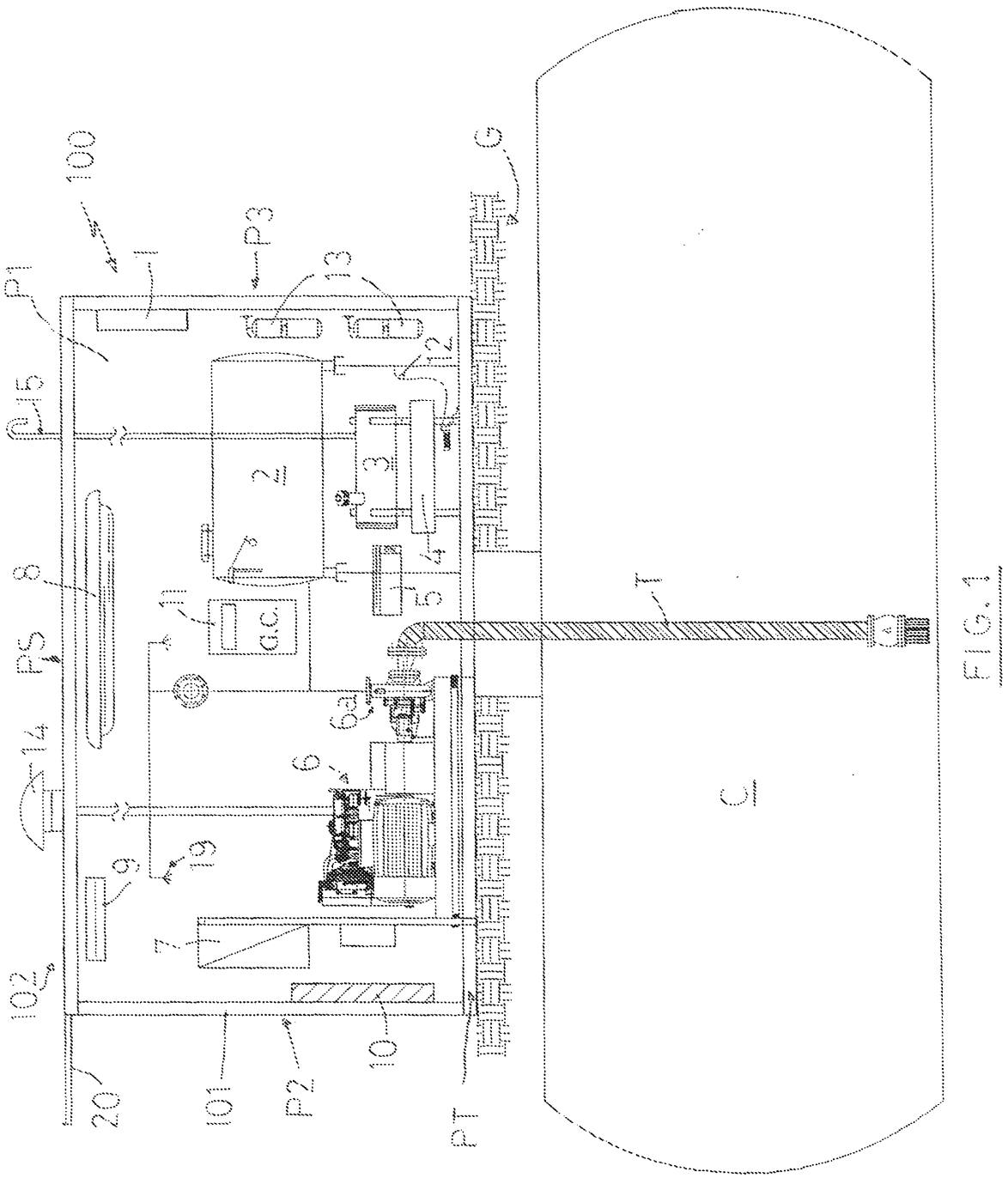


FIG. 1

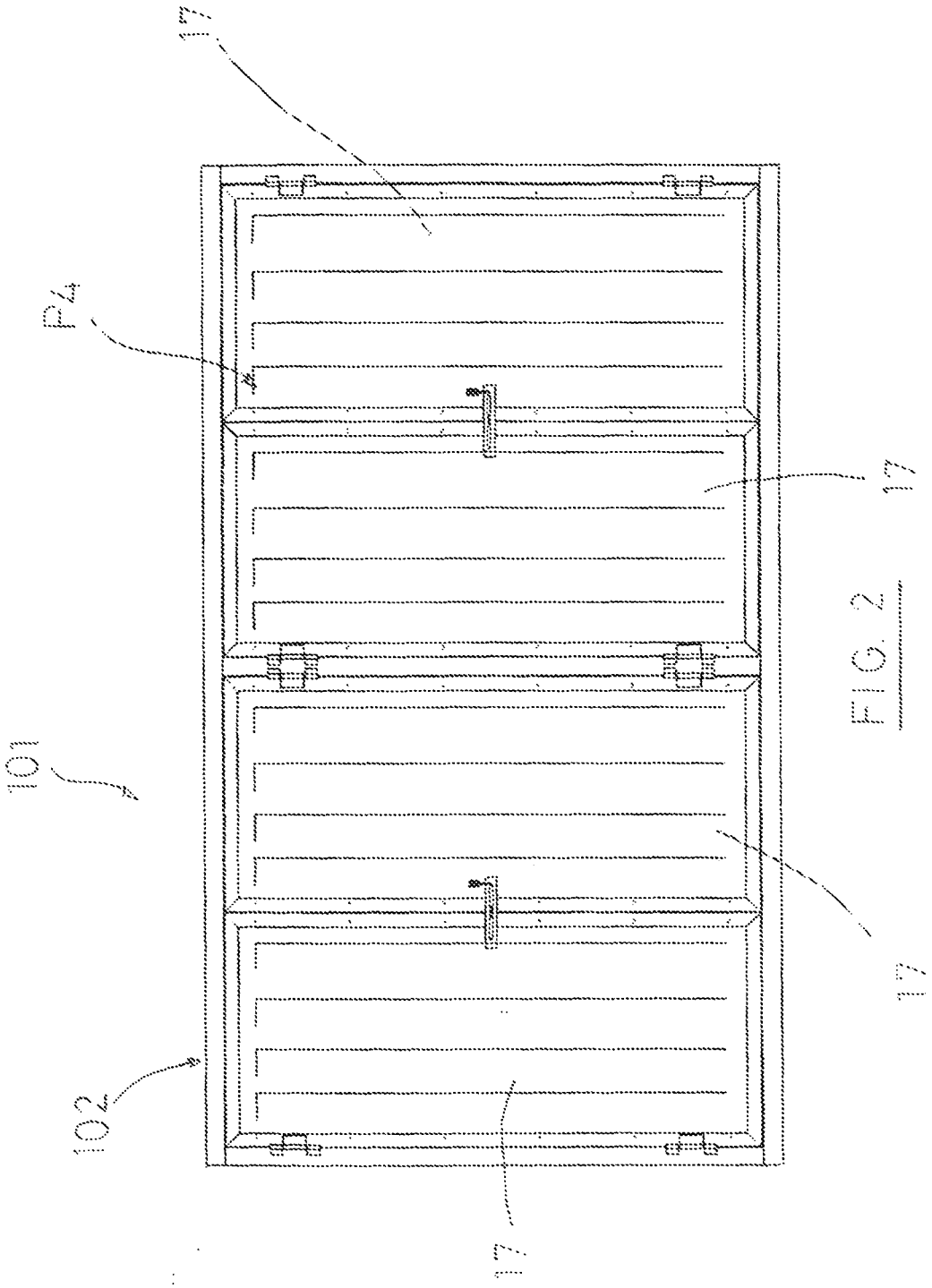


FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 20111753 U1 **[0010]**
- WO 2008109023 A1 **[0010]**
- DE 10124518 U1 **[0010]**