(19) Europäisches Patentamt
European Patent Office
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(11) **EP 2 722 076 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.04.2014 Bulletin 2014/17

(21) Application number: **12188679.0**

(22) Date of filing: **16.10.2012**

(51) Int Cl.:
A62C 35/20 *(2006.01)* ***A62C 33/04*** *(2006.01)*
F16L 11/04 *(2006.01)* *B65H 75/36* *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(54) **Fire hose**

(57) This invention is related to fire hoses. The present invention comprises a first fluid conduit 3 suitable for being integrated into a domestic water supply; an industry standard fire hose 5 between the first fluid conduit 3 and a spray nozzle 9, the fire hose 5 being moveable by a user between a stowed and deployed configuration; a housing 4 for containing the hose 5 in the stowed configuration wherein the first fluid conduit 3 is fixed to the housing 4; a valve 2 coupled to the first fluid conduit 3 for controlling the flow of water from the domestic water supply to the conduit ;such that, when in use, pressure from the water supply assists the user in moving the hose 5 from a stowed to a deployed configuration.

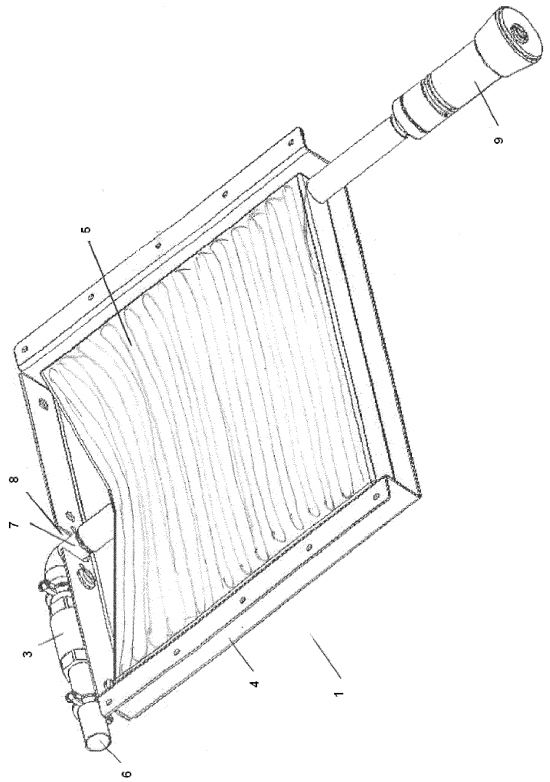


Figure1

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Description

Field of the Invention

[0001] The present invention relates to fire extinguishing equipment. In particular, the invention relates to fire hoses and their storage.

Background to the Invention

[0002] Fires are a frequent cause of property damage, injury and loss of life. Greater awareness amongst the general public of the dangers of fires has led to an increase in the use of fire detection equipment such as heat sensors, smoke sensors and fire alarms in both commercial and domestic settings. Greater regulation in the field of fire codes and building fire standards has also led to improvements in the design and construction of buildings to minimise the risk of injury or loss of life as a result of the breakout of fire.

[0003] While improvements in fire detection equipment may help to reduce the danger to life and property in the event of a fire breakout, they do not address the challenge of tackling a fire once it has ignited. A range of equipment and systems have been devised to either tackle a fire breakout in a building automatically or to allow an individual within the building to attempt to tackle a fire.

[0004] Automatic sprinkler or gas diffusion systems are commonplace in large commercial settings or dwellings with multiple inhabitants such as apartment blocks or hotels. Such systems are activated automatically in response to the triggering of a fire alarm. The systems eject water or fire retardant gases, such as CO_2, from a system of spray nozzles or sprinklers located on the ceiling of each storey of the building. Such systems are effective against the early spreading of fire throughout a building, however many systems do not offer a localized functionality and are often triggered over a much greater area than is necessary to effectively contain the fire. As a result, it is a common occurrence that sprinkler systems can cause widespread water damage to a building in their attempts to prevent fire damage.

[0005] Localized fire tackling systems generally take the form of self-contained fire extinguisher devices. These are normally handheld pressurized canister devices with a nozzle activated by a user. Upon activation, the nozzle then dispenses the contents of the canister which can be water, foam or a fire retardant gas. Such devices are effective against small fires or fires in their early stages. However, the contents of the canister may be insufficient to extinguish fires beyond their very early stages. In addition, the canisters can prove difficult to operate for users who are unaccustomed to them. Furthermore, the pressurised canisters which hold the fire extinguishing substances must be serviced or verified by a professional regularly in order to ensure that the device is in good working order. The device may become ineffective if not properly serviced in this manner.

[0006] There is a need for an effective and easy to operate means of tackling the breakout of fire which does not cause widespread water damage yet which is capable of tackling fires beyond the early stage of ignition.

Summary of the Invention

[0007] The present invention comprises an apparatus comprising a first fluid conduit suitable for being plumbed into a domestic water supply; a fire hose between the first fluid conduit and a spray nozzle on the end of the fire hose, the fire hose being moveable by a user between a stowed and deployed configuration; a housing for containing the hose in the stowed configuration wherein the first fluid conduit is fixed to the housing; a valve coupled to the first fluid conduit for controlling the flow of water from the domestic water supply to the conduit; such that, when in use, pressure from the water supply facilitates moving the hose from a stowed to a deployed configuration.

This has the advantage of providing an apparatus suitable for the localised tackling of fires within a domestic setting. The industry standard fire hose is heat resistant and durable. These are significant advantages over a common domestic hose which would be unsuitable for tackling flames at close proximity. Water pressure from the water supply facilitates the rapid deployment of the hose from its stowed to its deployed configuration. In relation to the present invention the term "fire hose" has the specific meaning of being a hose which conforms to the fire standard BS EN 14540:2004.

[0008] The outer surface of the hose may comprise a polyester material outer surface and the inner surface may comprise a rubber material. The rubber material may ethylene propylene diene monomer (EPDM). Such materials are typical of the type used to fabricate fire hoses.

[0009] The hose of the apparatus may be contained in the housing in a folded zigzag configuration. Such a configuration allows for rapid deployment of the fluid conduit when the apparatus is in use. Such a configuration does not require excessive pulling of the conduit or manoeuvring by a user in order to extend the conduit from the housing.

[0010] The first fluid conduit may be a rigid pipe. The pipe may have an external diameter of at least about 1.2 cm and suitably about 2cm (about ¾ inches). This allows the apparatus to be easily integrated into a domestic plumbing system. ¾ inch diameter copper pipes are the standard water distribution pipes for domestic plumbing in many countries.

[0011] The activating means of the apparatus may be a manually activatable valve for example a lever valve. It is activable to allow water to flow from the water supply into the fluid conduit. This allows for ease of use and operation of the apparatus once installed.

[0012] The housing of the apparatus may be substantially rectangular in shape. The housing is shaped so that it may fit easily to walls or to a horizontal surface.

[0013] The housing may further comprise a transparent panel through which the hose is visible. This allows a user to inspect the hose to ensure that it is properly contained in the housing in the zigzag configuration. It also allows a user to inspect for defects in the hose.

[0014] The housing may further comprise one or more flanges comprising a plurality of holes to allow for securing means to be fitted to the housing. This allows for ease of installation meaning that the device can be fitted to a wall in a domestic setting without specialist skill and using basic tools such as a screwdriver. The housing may be fixed to a wall by means of screws or other fixing means placed through the holes in the flanges.

[0015] The housing may further comprise one or more holes to allow the fluid conduit to be fixed to the housing in different positions. This allows the fluid conduit to be placed in a position which best suits the user and the location of the apparatus in a building.

[0016] The housing may further comprise a retaining means to maintain the hose in a stowed configuration wherein the hose is releasable from the retaining means upon being moved to a deployed configuration by a user. Suitably the hose is retained in the housing with a retaining means that keeps the hose in a stowed configuration but releases the hose to a deployed position when the hose is pulled upon by the user, and/or the activating means is activated to allow water to flow into the fire hose. This occurs without any requirement for a user to manually operate a release to release the hose from its stowed configuration.

[0017] The fluid conduit of the apparatus may be plumbed into any plumbing within a building but desirably it is plumbed into a domestic plumbing system. This provides a water supply to allow the apparatus to be used to tackle fires. Desirably it is plumbed into the plumbing at a position where it can receive a feed from a mains water supply. In one embodiment the device of the invention is plumbed into a system to receive mains water feed, for example in a domestic dwelling. In another embodiment the device of the invention is plumbed into a system to receive a gravity water feed from a water tank, for example in a domestic dwelling. In another embodiment the device of the invention is plumbed into a system to receive both a mains water supply and a gravity water feed from a water tank, for example in a domestic dwelling.

[0018] The present invention also provides an assembly kit for providing a fire house system suitable for use in a domestic environment, the kit comprising a first fluid conduit suitable for being integrated into a domestic water supply; an fire hose comprising a spray nozzle; a housing for containing the hose; a valve for coupling to the first fluid conduit for controlling the flow of water from the domestic water supply to the conduit.

[0019] The invention also relates to a plumbed water system wherein the device of the invention is plumbed into the system so that water from the system can be directed through the fire hose onto a fire. As mentioned above it is desirable to the plumbed water system is then arranged to provide a mains water feed to the device of the invention. In one embodiment the device of the invention receives a water feed from a rising mains cold water feed. In another embodiment of the device of the invention receives the gravity feed from a water tank feed to the hot water cylinder, for example in a domestic dwelling. In another embodiment the device of the invention receives a water supply from both a rising main and from a gravity water feed from a water tank, for example in a domestic dwelling.

[0020] The invention relates to an apparatus, kit or system substantially as described herein and/or as illustrated in the accompanying drawings.

Brief Description of the Drawings

[0021] **Figure 1** is front view of the apparatus with the hose attached to the first fluid conduit.

[0022] **Figure 2** is a rear view of the apparatus with the valve in the deactivated or closed position

[0023] **Figure 3** is a rear view of the apparatus with the valve in the activated or open position

[0024] **Figure 4** is a front perspective view of the apparatus with the hose detached from the first fluid conduit

[0025] **Figure 5** is a rear perspective view of the apparatus

Detailed Description

[0026] The present invention will now be described with reference to the accompanying drawings.

[0027] The apparatus 1, as shown in **Figure 1 and 2**, comprises a valve 2 attached to a first fluid conduit or pipe 3. The first fluid conduit 3 is suitable for attachment to a water supply. The first fluid conduit 3 is attached to a housing 4 which contains a hose 5. The first fluid conduit 3 is attached in fluid communication with the hose 5. The housing 4 may be fixed to any desirable support such as a wall or a shelf.

[0028] The valve 2 may be moved between a deactivated position or closed position (as in Figure 2) and an activated or open position (as in **Figure 3**). The valve 2 permits the flow of fluid through the conduit in the open position and does not permit the flow of fluid through the conduit in the closed position. The valve 2 may be a lever type valve. The lever 2 may be retained in the closed position by a fastening means for example by a tie means. This prevents accidental opening of the valve. The fastening means releases or breaks when the lever is pulled to the open position.

[0029] The first fluid conduit 3 is generally cylindrical in shape. The conduit 3 has two open ends 6, 7. One end 6 is external to the housing and is suitable for being attached to a domestic water supply. The other conduit end 7 enters the housing 4 via an opening 8 in a side wall of the housing 4. Within the housing 4, the first fluid conduit 3 is attached to the hose 5. The hose 5 comprises a

nozzle 9 on its other end. The first fluid conduit 3 may further comprise a valve to switch between alternative water sources, for example to switch between a mains water supply and a storage tank water supply.

[0030] The first fluid conduit 3 may be a rigid pipe. It may be a standard ¾ inch diameter copper pipe common to many domestic plumbing systems. The conduit 3 may be straight along most of its length and may comprise a bend 10 (**Figure 4**) towards one end so that the end 7 may be directed into the housing 4. The fluid conduit may be attached to the housing 4 by means of brackets 11. The brackets 11 may be O- shaped and extend about the outer surface of the conduit 3. The conduit may have a threaded end 12 at one end 7 to allow it to be fixed to the hose 5. The other end 6 of the conduit may be connected to a domestic water supply. When fixed in this manner, water is capable of being passed from the water supply through the first fluid conduit 3 to the hose 5. Further details of the operation of the apparatus in use will be described below.

[0031] The hose 5 may be comprised of suitable industry standard fire hose material. Industry standard fire hose is any hose designed and fabricated in accordance with the following standards BS EN 14540:2004. The hose 5 may comprise a polyester outer surface and a rubber inner surface. The outer surface may be a high tenacity multifilament yarn. The inner surface may be comprised of ethylene propylene diene monomer (EPDM) material.

[0032] The hose 5 may be stored in the housing in a folded configuration. The folded configuration may be a zigzag configuration (as in Figure 1). This may also be termed a "flaked configuration". A fire hose in such a configuration may be termed a "flaked" hose. The hose 5 may be stored in any configuration which allows for rapid deployment of the hose. The hose 5 may have a threaded end on one end to allow it to be fixed to a receiving threaded end 12 of the first fluid conduit. In a preferred embodiment, the hose 5 is fitted to a barbed outlet from the first fluid conduit at the rear of the apparatus 1. The hose has a burst pressure of about 50 bar and a safe working pressure of about 16 bar.

[0033] The other end of the hose has a nozzle 9. The nozzle 9 is preferably a type which complies with EN671-1 (Fixed Fire-Fighting Hose Systems) standards. The nozzle 9 allows for switching between spraying functions. The nozzle 9 may be adjusted to switch between a jet spray function and a fan spray function. The hose 5 may be sized to be a variety of lengths. The hose 5 may be up to ten metres in length. In a preferred embodiment, the hose is up to fifteen metres in length. Longer custom lengths may be provided.

[0034] The housing 4 may be substantially rectangular in shape. The housing 4 may be fabricated from a strong durable material such as a metal or an alloy. The housing 4 may be fabricated from aluminium. The housing 4 is preferably coloured red to enhance visibility. The housing 4 comprises a flat bottom panel 13 and three walls 14 extending from the surface of the bottom panel 13. Two of the walls 15,16 further comprise flanges 17 with a plurality of holes 18 to allow the housing to be fixed to a wall or a shelf. The third wall 19 comprises an opening 8 to allow the first fluid conduit 3 enter the housing 4 so that it can be connected to the hose 5. The housing 4 has a detachable top panel 20 which can be fixed to the housing 4 via fixtures 21 through the holes 18 in the flanges 17. With the removable panel 20 in place, the fourth side 22 of the housing 4 is open allowing the nozzle end of the hose 5 to reside outside the housing 4. The hose 5 is stored in the storage area 23 of the housing 4 between the fixed bottom panel 13 and the detachable top panel 20. The top panel 20 is detachable to allow for inspection and/or replacement of the hose 5 if required. The top panel 20 may be fabricated from a transparent material. The transparent material may be a plastics material. In a preferred embodiment, the top panel 20 may be fabricated from a strong durable material such as a metal or an alloy.

[0035] The housing may further comprise one or more holes 24 to allow the first fluid conduit 3 to be fixed to the housing in different positions (**Figure 5**). Depending on where the apparatus 1 is to be placed in a building, it may be desirable to fix position of the fluid conduit 3 such that it faces in a particular direction suited to its location. For example, it would be desirable to fix the fluid conduit 3 to the housing in such a manner as to facilitate connection to the domestic water supply.

[0036] The apparatus 1 may be fixed to any support such as a wall, partition or shelf. The apparatus 1 may be fixed by placing screws 25 or other fixings means through the plurality of holes 18 located on flanges 17 on the sides of the housing 4. The housing 4 may be fixed such that the fourth side 22 or open end of the housing has a horizontal orientation or it may be fixed such that the open end 22 of the housing has a vertical orientation. The apparatus 1 is most suitable for use in small buildings for example an individual home or apartment. In a preferred embodiment, the apparatus 1 is fixed in close proximity to a domestic water cylinder, for example in an airing cupboard. In a further embodiment, the apparatus 1 is fixed in close proximity to a sink in a domestic kitchen, for example under the sink area.

[0037] Suitably the hose is retained in the housing with a retaining means that keeps the hose in a stowed configuration but releases the hose to a deployed position when the hose is pulled upon by the user, and/or the activating means is activated to allow water to flow into the fire hose. This occurs without any requirement for a user to manually operate a release to release the hose from its stowed configuration. The retaining means may be a flexible extendible loop, a cord or a tie which is wrapped around the hose with sufficient tightness to maintain the hose in a stowed configuration but which is sufficiently loose to allow the hose to deploy when pulled upon by a user. The cord may be elasticated.

[0038] The operation of the apparatus 1 will now be

described. The apparatus 1 is first fixed in the desired position in a building. The apparatus 1 should ideally be positioned such that the hose 5 can be extended to reach all rooms in the building in which the apparatus 1 is situated.

[0039] The apparatus 1 is then connected to the water supply via the first fluid conduit 3. This is achieved by connecting the open end 6 of the fluid conduit 3 which is external to the housing 4 to a suitable point in the piping network of the buildings water supply.

[0040] The apparatus 1 should remain with the valve 2 in the closed position until it is required to be in use. When the apparatus 1 is to be activated, the valve 2 should be switched to the open position. The user takes hold of the hose 5 and moves away from the apparatus 1. In this manner, the user begins to unfold the hose 5 from its stored configuration. Pressure from the water supply facilitates the hose 5 in unfolding from its stowed configuration into its deployed "in use" configuration. When in use, water from the water supply passes through the first fluid conduit 3 and through the hose 5. Water then passes from the hose 3 through the nozzle 9 which is held by the user. The user holds the nozzle 9 and can thus direct the ejecting water at the source of a fire. The apparatus may be deactivated by switching the valve 2 to the closed position. The supply of water to the nozzle 9 is thus terminated. The supply can also be terminated at the nozzle 9.

[0041] The hose 5 is intended to be a single use element. Thus, if the apparatus 1 is used in the manner described above, the top panel 20 of the housing may be detached in order to remove the hose 5 and to allow a replacement to be fitted.

[0042] The invention extends to an assembly kit for assembling the device/fire apparatus of the invention. Furthermore, the invention extends to a plumbed water system incorporating a device according to the present invention and as described herein and shown in the drawings.

[0043] The words "comprises/comprising" and the words "having/including" when used herein with reference to the present invention are used to specify the presence of stated features, integers, steps or components but do not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

[0044] It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable subcombination.

Claims

1. A fire hose apparatus comprising:

a first fluid conduit suitable for being plumbed into a domestic water supply;
a fire hose between the first fluid conduit and a spray nozzle, the fire hose being moveable by a user between a stowed and deployed configuration;
a housing for containing the hose in the stowed configuration wherein the first fluid conduit is fixed to the housing;
a valve coupled to the first fluid conduit for controlling the flow of water from the domestic water supply to the conduit ;
such that, when in use, pressure from the water supply facilitates moving the hose from a stowed to a deployed configuration.

2. The apparatus of claim 1 wherein the outer surface of the hose is comprised of a polyester material outer surface and the inner surface is comprised of a rubber material.

3. The apparatus of claim 2 wherein the rubber material is ethylene propylene diene monomer (EPDM).

4. The apparatus of any preceding claim wherein the stowed configuration of the hose is a folded zigzag configuration.

5. The apparatus of any preceding claim wherein the first fluid conduit is a rigid pipe.

6. The apparatus of claim 5 wherein the pipe has an external diameter of about ¾ inches.

7. The apparatus of any preceding claim wherein the valve is a lever valve.

8. The apparatus of any preceding claim wherein the housing is fabricated from a metal or alloy.

9. The apparatus of any preceding claim wherein the housing further comprises a transparent panel through which the hose is visible.

10. The apparatus of any preceding claim wherein the housing further comprises one or more flanges comprising a plurality of holes to allow for securing means to be fitted to the housing.

11. The apparatus of any preceding claim wherein the housing further comprises one or more holes to allow the first fluid conduit to be fixed to the housing in different positions.

12. The apparatus of any preceding claim wherein the housing further comprises a retaining means to maintain the hose in a stowed configuration;
wherein the hose is releasable from the retaining

means upon being moved to a deployed configuration by a user.

13. The apparatus of claim 1 wherein the fluid conduit is integrated into a domestic plumbing system.

14. An assembly kit for providing a fire house system a domestic environment comprising:

a first fluid conduit suitable for being integrated into a domestic water supply;
a fire hose comprising a spray nozzle;
a housing for containing the hose;
a valve for coupling to the first fluid conduit for controlling the flow of water from the domestic water supply to the conduit.

15. A plumbed system within a building wherein the apparatus according to any one of Claim 1 to 12 is plumbed into the system.

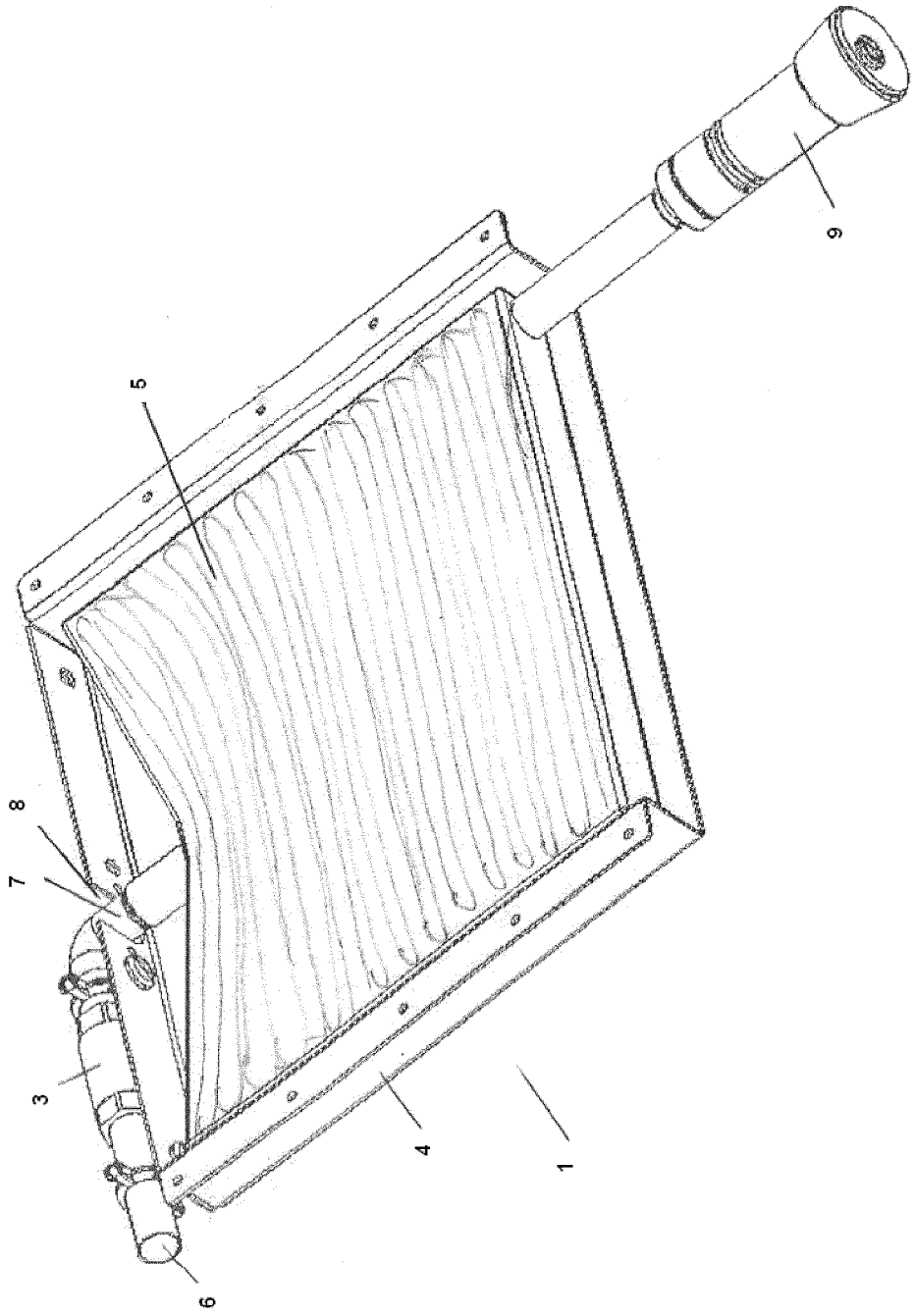


Figure1

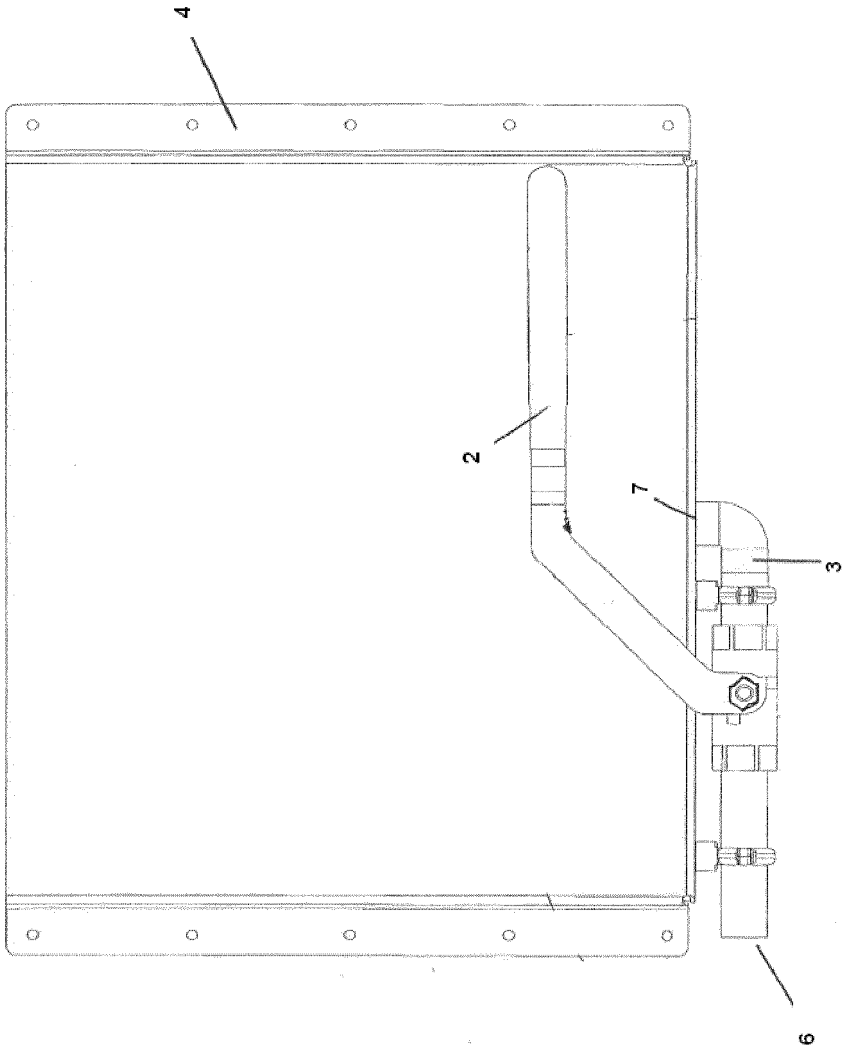


Figure 2

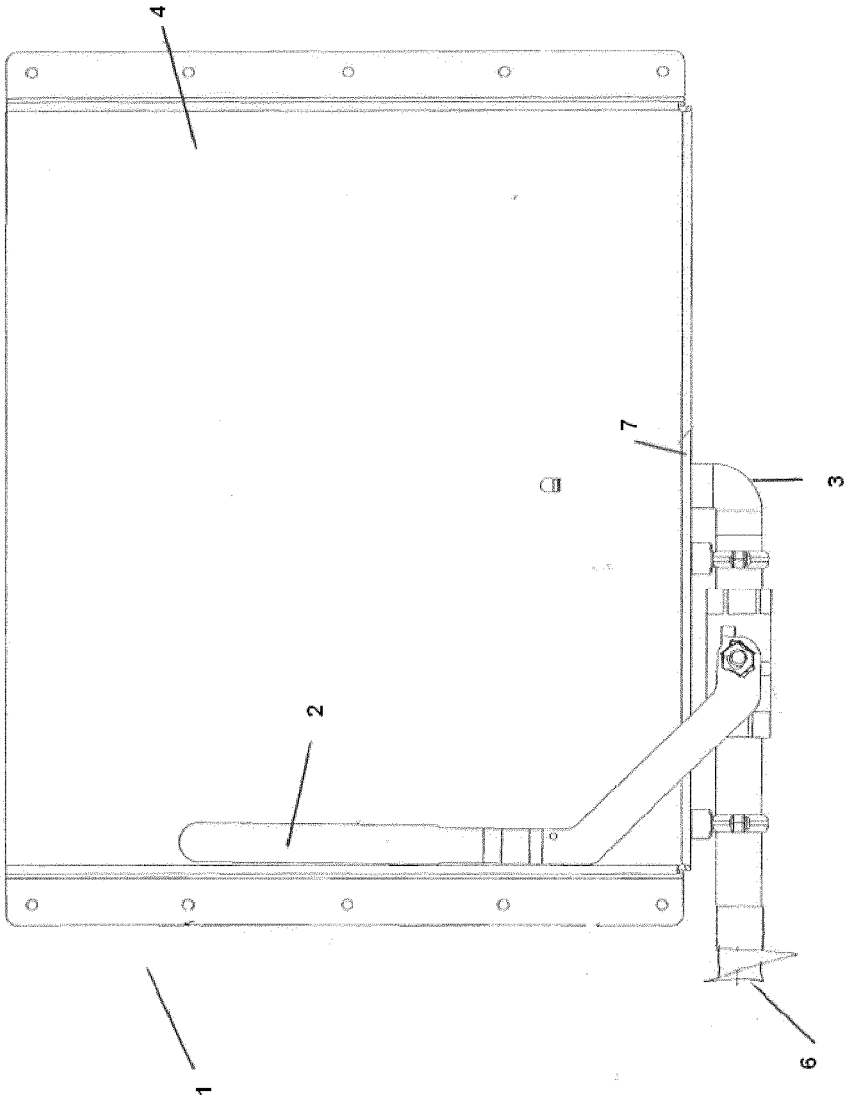


Figure 3

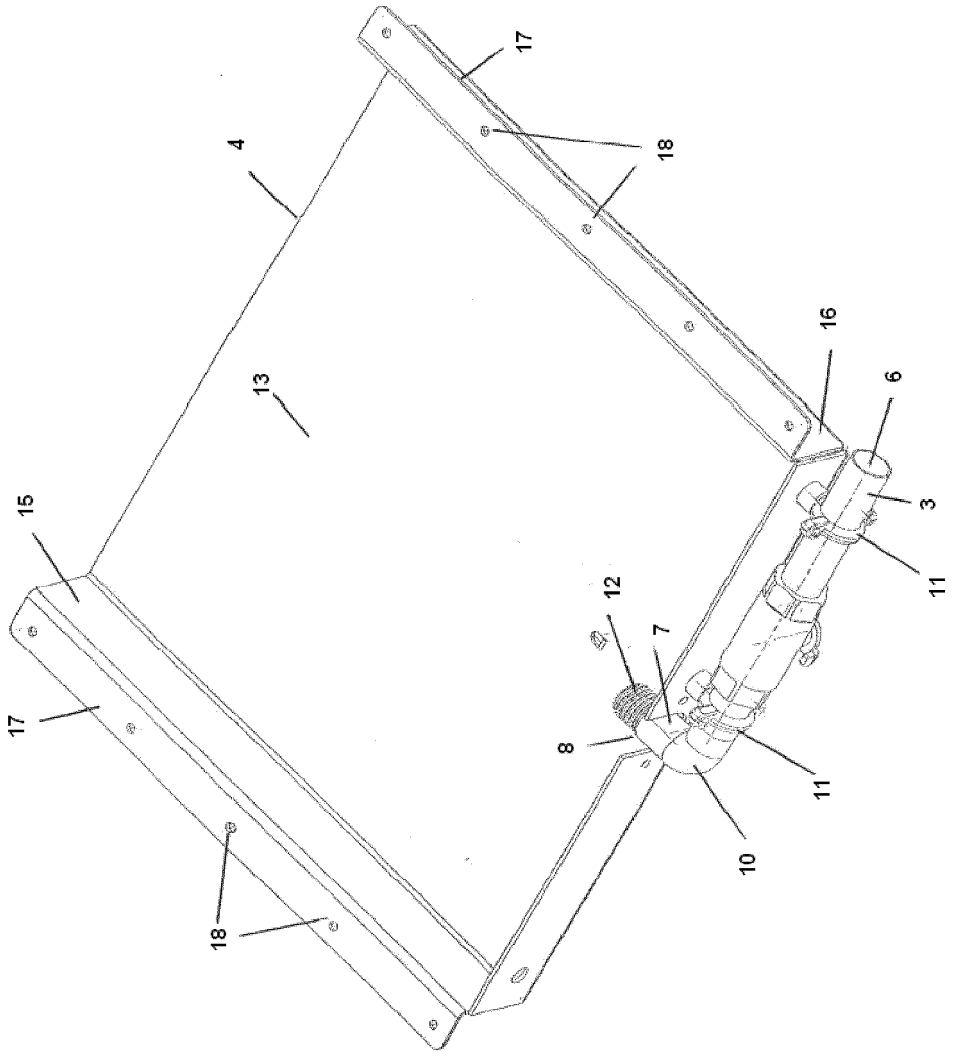


Figure 4

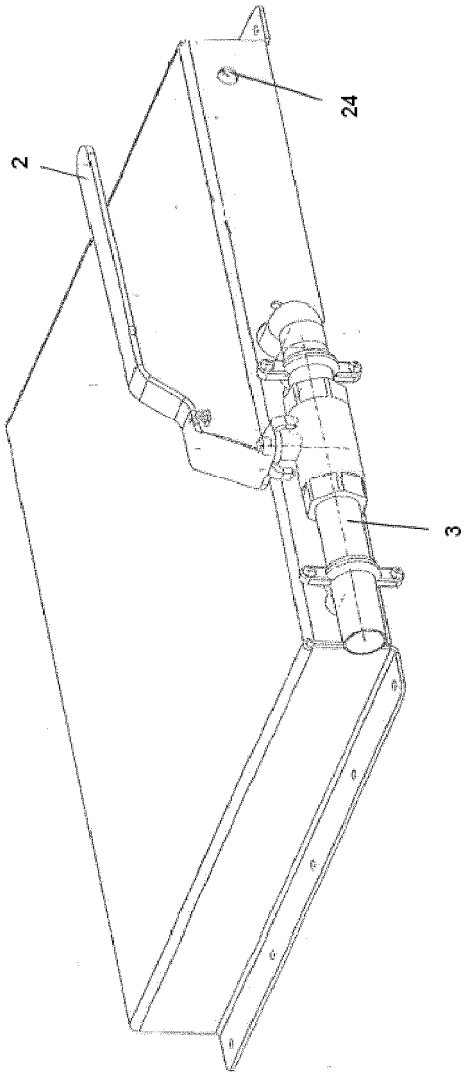


Figure 5

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EUROPEAN SEARCH REPORT

Application Number
EP 12 18 8679

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	DE 16 57 454 U (ALBERT ZIEGLER SCHLAUCH U FEUE [DE]) 18 June 1953 (1953-06-18)	1-3,5-15	INV. A62C35/20
A	* figure 1 * * claims 1,2 * * page 2, paragraphs 3,5 *	4	A62C33/04 ADD. F16L11/04
X	US 4 429 931 A (BROOKS ROBERT [US]) 7 February 1984 (1984-02-07) * figures 1,2 *	1-15	B65H75/36
X	GB 1 526 164 A (SCHLEGEL H) 27 September 1978 (1978-09-27)	14	
A	* figures 1,2 *	1,4,13, 15	

TECHNICAL FIELDS SEARCHED (IPC)

A62C
F16L
B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 April 2013	Nehrdich, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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1

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 18 8679

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10-04-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 1657454 U	18-06-1953	NONE	
US 4429931 A	07-02-1984	NONE	
GB 1526164 A	27-09-1978	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82