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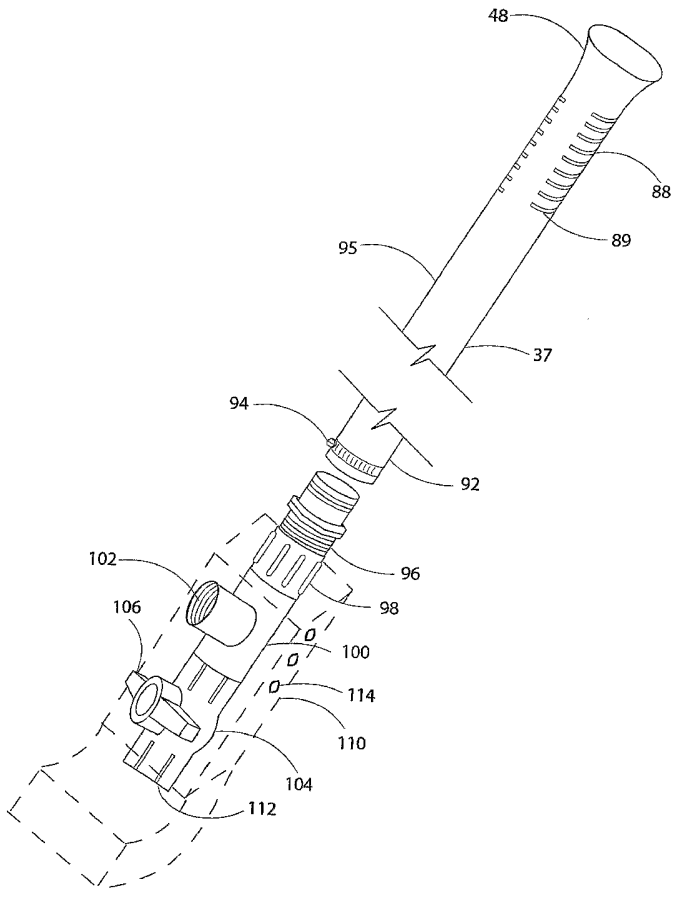
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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
— *of inventorship (Rule 4.17(iv))*

[Continued on next page]

(54) **Title:** RAINWATER COLLECTOR



(57) **Abstract:** A gutter descent assembly (20) designed to collect rainwater falling down a house roof surface (22), the assembly comprising an upper part (26) joining at a gutter exit (23), a lower part having a faucet (30), and a descent exit (38), the three of them made in usual sheet metal. The collection of water is obtained by means of internal components forming an internal channel: a funnel (48) directs the gutter water towards an internal pipe (37), then towards the faucet (30). The water is conveyed from the faucet by a hose (34) to a tank (36). When the tank is full, or if the water runs too fast to be drained by the internal channel, apertures (50) made at the funnel (48) base allow the draining by an annular duct situated between the internal pipe (37) and the sheet metal, for directing towards the descent exit (38). The funnel (48) may be provided with a captor head (80) to fix to the gutter exit (23). A male end of funnel(90) is provided with hose threads.

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SPECIFICATION

TITLE: Rainwater collector

FIELD OF THE INVENTION

This invention is related to the field of rainwater collector systems; more specifically to systems adapted to house gutters.

PRIOR ART

Today, people are more aware about protection and preservation of the environment. The rational use of water is a capital step towards an integrated sustainable development strategy: drinkable water resources are few, and even if North America has plenty, a majority of human beings on Earth does not have daily access to drinking water. Even here in Quebec, several municipalities are touched by dryness every year. The first alarm signal given by town councils during dryness is generally a warning to the citizens asking to reduce the use of drinking water for lawn watering. Many people like to look at their nice green lawn for the attractive aspect given to the homes and consequently, to the neighbourhood. A need is obviously felt to permit to watering of lawns but while preserving drinking water.

The present invention proposes practical means, low in cost and easy to install and permitting to keep rainwater in anticipation of further utilization during dryness, as well as avoiding street flooding during heavy rainfalls.

Our research among patents revealed some systems proposing devices trying to find solutions to these problems.

CA 2129020, of PCT/FR93/00102 published under number WO93/15281, and also deposited in the United States under number **5,490,538:** proposes a device anchored to an existing gutter descent wherein a hole is punched,

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the device comprising a deflector so called scoop channelling a part of the water running in the gutter descent towards the exterior and towards a utilization site.

US 5,220,755, presents an external pipe at the descent of the gutter endowed with a faucet, this external pipe allowing to create a water column meant to direct water towards a utilization site as well.

US 5,730,179, Taylor proposes a reservoir mounted directly to a house gutter network. A tank can accumulate some amount of water to discharge whenever needed; there is no excess except as limited by the tank capacity. The position of the tank is limited to the proximity of the descent post. Furthermore, the tank by its prominent position changes the structure and the look of the house on which it is attached.

US 5,863,151, presents a rainwater collector system constituted of a collector provided with two exits *10,18* and joined to a portion of a gutter descent. A tube *14* directs the water at the bottom of the collector towards the top of a reservoir *16*, a second tube directs the water at the top of the collector towards a drain consisting of a secondary gutter descent when the reservoir is full. There is no volume of water in the gutter to fill a barrel. There is no water column to act as hydrostatic pressure. The reservoir *16* is claimed with an aperture at the top. Several elements are obvious and visible in regard of the house, for example the juxtaposed tiles *12,18*.

US 5,533,303, proposes a rainwater channel system oriented directly towards plants. Channel reservoirs are joined to the gutter descent and direct the water towards a secondary channel which sends the water to plants hidden under a patio, while rain is falling and watering other places. A cut off valve is positioned at the bottom.

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US 5,931,118, presents a bird bath filling automatically by a channel system directing the water from a gutter descent.

Certain patents appearing less related to the invention have also caught our attention: US 5,842,308, US 5,735,304, US 5,114,594, and US 4,386,484 from classes searched: US 52/16, 137/357.

OBJECTIVES AND ADVANTAGES

The main objective of the invention is to provide homes with a system for storing rainwater in view of utilizing it at a later date for purposes other than drinking water: watering plants, for washing cars etc. The objective for a city is to reduce rainwater in heavy rainfalls which surges in large amounts into street sewage and permitting the citizens the storing of water from rainy periods to further use during dry periods when the use of drinking water is under control.

A secondary objective is to provide a system which is not costly, practical, easy to install against a gutter attached to the roof of a house and necessitating a minimum of parts and consequently a minimum of cost. To provide an aesthetic system, which does not remove any of the agreeable features of a house, that it be safe to utilize while facilitating emergency draining without flooding the gutters. It is proposed to use a canalization system inside a standard gutter descent pipe provided with a faucet or valve for discharging. The canalization system is topped by a funnel located at the very top of the descent, canalizing water inside an internal pipe to form a water column, the column providing hydrostatic pressure to convey the water towards the point of utilization or storage.

DRAWINGS

Relative to drawings which illustrate one embodiment of the invention, FIG.1 is a perspective of the device installed alongside a house roof.

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FIG.2 is a cut according to line 2-2 of FIG.1.

FIGS.3A, 3B et 3C are cuts according to line 3-3 of FIG.2.

FIG. 4A and 4B are cuts of an alternative to the descent of FIG.2.

FIGS 5A and 5B are perspectives of a part 48 and cut thereof.

FIG.6 is an assembly providing a recuperation column.

FIG.7A is a cut view of area 70 of FIG 4A expanded.

FIG.7B is a cut view of an alternative to area 86 of FIG 7A.

DETAILED DESCRIPTION OF THE DRAWINGS.

In the description which follows and in the accompanying drawings similar numbers refer to similar parts in the figures.

FIG.1 illustrates a descent assembly **20** of a gutter collector. Joined to a horizontal gutter **21** of a house roof surface **22**, at the extremity there is a gutter exit **23** finished by a male reduced end **24**. The descent assembly **20** comprises three parts, an upper part **26**, a lower part **28** and a descent exit **38**, the three of them made in usual sheet metal. The lower part **28** has a faucet **30** assorted of a faucet valve **40** and a bleed cap **32**. The water coming from the house roof surface **22** to the horizontal gutter **21** is canalized to the gutter exit **23**, as seen in FIG.2; the water exits through the faucet **30** when the valve **40** is open and is transported to a tank **36** by a hose **34**. The tank **36** is an open barrel filled by its base but could be of different types depending on the application.

FIG.2 illustrates a cut view of the descent assembly **20** that provides an inside view of the descent assembly **20**. We see at the top of FIG.2 a side view of the horizontal gutter **21**, and a gutter exit **23** finished by a reduced end **24** that goes in a female top **27** of the upper part **26**. A funnel **48** located at the top in the center reducing in a straight tubing **49** in which at least one aperture **50** is made. The straight tubing **49** has a

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diameter of typically 1½ inch. A funnel top 31 has been heated from a round pipe into a typically rectangular descent assembly and its upper part 26. At a bottom part 51 of the straight tubing 49 is adapted a male end pipe 44 with a smaller diameter, for example an ABS grooved plastic pipe with a diameter of 1¼ inch to be able to penetrate inside the 1½ inch pipe. The pipe could be assembled in its ensemble. The lower part of the gutter comprises an internal pipe 37 with a diameter that could be adapted easily to the male end pipe 44 inwardly or outwardly. In the lower part 28 as in the upper part 26, the internal pipe 37 is kept in position by means of an inferior screw 58 for the lower part 28 and by a superior screw 56 for the upper part 26 or from a suitable attach system going through the external sheet metal of the descent assembly material. The joint between the upper part 26 and the lower part 28 of the descent assembly 20 is done by two points: first, the male end pipe 44 goes into the female end pipe 46 at the interior of the lower part 28, and the male end gutter 42 of the bottom of the sheet metal of the upper part 26 of the descent assembly 20 goes in the top sheet metal of the lower part 28, the latter playing a female role. The junctions of the male end pipe 44 with the lower part of the straight tubing 51 and with the female end pipe 46 are waterproof to keep the strength to the water column. The internal pipe 37 extends to evacuation components of the descent such as the faucet 30 and the bleed cap 32. These two components are attached to the internal pipe 37 going along the lower part 28 of the descent assembly 20. The lower part 28 is connected to the upper part 26 with an internal joint and an external joint. The external joint is made of the male end gutter 42 penetrating into a female end gutter 43 of the lower part 28. The internal joint is made of the male end pipe 44 penetrating into the female end pipe 46. The bottom

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part 51 comprises one or several apertures 50; in the illustration, one can see one in the front. One sees the funnel 48, which takes up at its top all the width of the upper part 26 of the descent assembly 20. If the water is not held back, it will go towards the bottom through the pipe and will exit either by the faucet 30 or by the bleed cap 32. However, if the water cannot be evacuated toward the bottom, it will fill the pipe to the aperture 50. All the additional water will be drained by the aperture 50 and will be conveyed outside the pipe but inside the descent gutter to the descent exit 38. Thus, the pipe forms an internal canalization that could be used as internal tank, while the room between the pipe and the sheet metal of the gutter forms an external canalization to the pipe serving as a drain. Finally, to maintain the pipes of the inner columns straight with the forms of the gutters, there is a superior screw 56 and an inferior screw 58. There is also an inner enlargement 60 to fit the lower part 28 to the descent exit 38. An elbow 62 stocks sand or debris until they will be drained by the bleed cap 32 that could be replaced by an upright purge device controlled by a valve driven by a handle situated where the bleed cap 32 is in FIG.2. When the system is in use, a hose will be connected to a hose connector 64 located on the faucet 30 on the faucet valve 40.

Other configurations are possible, but this particular one provides a lot of advantages: the components are cheap, the external appearance of the house is not changed and the installation is quick and easy. In fact, during the installation, only the lower part 28 needs to be cut at its upper extremity to be adjusted at the height of the gutter of the house. With the illustrated configuration, the cutting could be done with a saw cutting simultaneously the sheet metal and the pipe, the superior part comprising the adaptation means necessary to the junction.

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FIG.3 is composed of three elements: 3A, 3B and 3C.

FIG.3A, on the left side, illustrates the installation of the lower part **28** to the upper part **26** of the descent assembly **20**. We notice that the male end pipe **44** will be the first to be joined to the lower part **28** by inserting it into the female end pipe **46** formed by the internal pipe **37** because this pipe exceeds the sheet metal of the upper part **26** of the descent assembly **20**. Once this pipe is inserted, the male end gutter **42** of the superior sheet metal is inserted in the inferior sheet metal. With this configuration, the male end pipe **44** of the higher pipe could easily be inserted firstly in the female end pipe **46** from the lower pipe, and be pushed in until the male end gutter **42** penetrates in the female end pipe **46** of the lower part of the descent exit **28** to form the configuration illustrated in FIG.3B. The system could be held together with a screw, but it is often solidified by a girdle around the descent, holding the descent to the wall of the house. The enlargement on the right side of FIG.3C shown how the apertures **50** could be drilled in the pipe material at an angle, this forms a lower bevels **52** and an upper bevels **54** (shown with dash lines), that keep the water from coming out the apertures **50** when it slides on the internal sides of the pipe. Because the apertures **50** are drilled at an angle, the holes seem oval in a front view perspective as in FIG.2.

FIG.4 shows two sections, FIG. 4A on the left, and FIG. 4B on the right; FIG. 4B is an enlargement of the circled part of FIG. 4A. FIG. 4A shows an alternative of the descent of the gutter in the event where the height available between the exit of the gutter and the ground would be greater than the length obtained by the descent when the lower section is not cut at all. An intermediary part **29** will have to be added between the upper part **26** and the lower part **28**. The lower part **28** is then cut so as to be

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adjusted to the resulting height, whereas the intermediate section can be installed in its full length. The resulting assembly presents a first junction **68** between the higher part and the intermediary part **29**, and a second junction **70** between the intermediary part **29** and the lower part **28**.

FIG. 4B shows an enlargement of the lower part **28** of the descent gutter where we can see two possible modifications regarding the configuration of FIG.2. In that case, there is no faucet, but only a direct hose connector **72** for a hose. Also, the purge does not consist of an elbow **62** and a cap but of a valve handle **74** (of which the components are not shown in the figure) installed in a straight area of the pipe towards the vertical blow off **78**. The valve is activated by a valve handle **76** located outside of the gutter which permits the interior mechanism of the valve.

FIG. 5A shows a fit cap **80** as a captor head to be fitted by nuts **81** to the male reduced end **24** of the gutter exit **23**. In the present embodiment the fit cap covers the starting area of a vertical descent **82**. The funnel part **48** has an enlarged section **86** having a rectangular fit **84**. Apertures **50** may be of oval type or in the form of elongated slits **88**. At the end of a male end of funnel **90**, the internal pipe **37**, as indicated on an outside surface thereof, has an internal surface **137**. Hose threads **134** may be provided at this level. The wall thickness **126** of the internal pipe is preferably of 3 to 6 mm. Apertures **50** may be round, square, or other.

FIG. 5B shows in cut view the apertures **50** and the internal pipe **37**.

FIG.6 shows the funnel part **48**, the elongated slits **88** provided with a slope **89** which may vary from 10 to 45 degrees. One sees the internal pipe **37** which takes the form of a circular body **95**. A low end of pipe **92**

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is provided with a strap **94** as tightening means. A double male adaptor **96** is followed by a female/male adaptor **98** into a tee **100** provided with a perpendicular tee exit **102** has for purpose to deliver water from the column to a storage area. An enlarged area **104** contains a wing valve **106** which is normally closed when the water is at a storage state. The valve is open when draining or in freezing times when the system is off. An extra exit **112** may also be provided; that exit may be threaded. A short bottom shell **110**, covers the tee and hides the valves. This is shown dotted to show the interior of the shell. That shell contains fixing holes **114**.

FIG 7A shows the funnel part **48** and the elongated slits **88** that are angularly oriented along the slope **89**. A rainwater collector **25** is of a short span and it ends as a female end pipe entering the internal pipe **37**. An existing vertical gutter shell comprises a female end gutter **43**,and a male end gutter **42** finishing as a male end pipe.

FIG 7B is for an installation where the shell is rather wide with respect to the rain water collector. The vertical descent **82** is of the broad type. The funnel part **48** and the slope **89** in the elongated slits are shown. An annular spacer **116** is shown as made of rubber or other suitable material. It has a bottom support **118** and a number of tension screws **120** in addition to an upper support **122** to prevent raising of the collector. A ribbon seal **124** is provided to stop infiltration of water below the male reduced end **24**. The funnel part **48** may be an interchangeable head **47**.

DISCUSSION on preferred applications of the invention

When it rains, rainwater slides on the roof of a house, goes down towards the gutters which convey the water in the descent gutter. When the gutter

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descent collector as disclosed hereby is installed, the water is canalized in the funnel **48**, and directed towards the lower pipe. If the faucet valve is open, water will slide down towards it. The object of the invention being collecting rainwater in a tank, the tank is advantageously connected to this faucet with a hose **34**. If the tank is empty, the hose will fill up with water, and then the water will rise up towards the top of the tank (while still rising up to the same level in the descent). When the entrance of the tank is lower then the aperture **50**, the tank will fill up until a maximal level associated to the height of the aperture **50**. If that level is higher than the top of the tank, the water in the tank will overflow. Thus, is constituted a rainwater tank which can be used in dry periods.

UTILIZATION DOMAINS

In the case of great thunderstorms, the water flow will intensify greatly. It is then that the water column will be useful, when the water does not flow rapidly enough into the tank through the hose, the water will rise in the internal pipe **37**, which will generate an increase of pressure in the hose. The water will then flow more rapidly toward the tank. It is only when the water flows excessively or when the level of water in the tank is above that of the aperture **50** that the water exits into the space between the funnel **48** and the upper part **26**. One could drill an upper hole in the gutter thereby allowing massive evacuation of the water and preventing overflowing in the event that the upper apertures would not allow a proper evacuation of the water. The water inlet of the tank can be located either at the top or the bottom. In the case where the inlet is located at the top, the water in the tank will not return into the hose until the water level is up to the inlet level. Whereas in the case where

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the inlet is located at the bottom, the pressure of the water will intensify in the hose. The resulting advantage of positioning the hose at the bottom is that the hose can be unscrewed from the faucet and be used for watering immediately. A valve may be positioned between the inlet and the faucet. However, when the inlet is located at the top, the hose could be unscrewed or the bleed valve opened, and the water in the tank will not go below the water inlet.

The water is collected and stored in the perspective of being used, and to do so, a certain pressure is generally necessary at the end of the hose. One can use a pump to generate water pressure, for example for watering plants. However, there are ways to obtain pressure without the use of a pump. Firstly, it is possible that the tank (or in general the water reserve) be more elevated than the point of utilization. Hence, the difference in elevation will accentuate the water pressure. However, the inlet of the tank must not be above (at a superior level) the evacuation aperture of the canalization tank because if this is the case, the water will exit by this opening instead of filling up the tank.

Secondly, it would be possible to use a tank comprising only one opening. In this case, the water will take up more and more space in the tank which will fill up leaving less and less room available for air. The air will then compress, hence resulting in an increase in internal pressure. The water will go out through the evacuation exit of the reserve canalization when the pressure exerted by the water column in that canalization multiplied by the difference in elevation in relation with the water level in the tank will be equal to the internal pressure of the air in the closed tank.

SUMMARY:

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A device to install on a horizontal gutter 21 to collect and store rainwater, comprising:

- a vertical gutter, called descent installed at one end of the horizontal gutter, comprising at least one upper section intended to collect water from the horizontal gutter 21 and a lower section intended to provide a water column, the upper section comprising a funnel 48 to collect water comprising means to collect the water from the gutter, the funnel 48 comprising at least one evacuation aperture 50,

- means to keep the funnel 48 and the lower section connected and generating the necessary pressure to feed a reserve tank until the rainwater overflows into the evacuation apertures and then flows along the gutter descent. The sum of the aperture areas is preferably equal to the cross sectional area of the captor head.

The horizontal gutter 21 is installed on the side of a house roof 22, comprising a gutter exit 23 provided with a male reduced end 24 and the means to collect the water comprise a waterproof attachment for the reduced end. The waterproof attachment comprises an upper part 26 comprising a female top 27.

The upper part 26 shows an inferior screw 56 for the funnel 48, and the lower part 28 comprises an internal pipe 37, and female end pipe 46 to the funnel 48. The upper part 26 comprises a male gutter end 42 and the lower part 28 is attached to the upper part 26 with the male connector, the re-attachment of the male connector to the internal pipe 37 sealing the water column inside the pipes 37, 44 and the re-attachment of the male end gutter 42 and the lower part 28 defining an annular gutter channel. The evacuation aperture is made at an angle, defining an upper

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bevel 54 and a lower bevel 52. There may be several straight evacuation apertures each of a small diameter, possibly in a large number.

It is well understood that the embodiments of the invention described above, in reference to the annexed drawings are indicative and by no means limitative, and that modifications and adaptations can be made without moving away from the bounds of the present invention.

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LEGEND

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CLAIMS:

We claim:

1. A device for installation on a horizontal gutter (21) to collect and store rainwater into a reserve (36), said device comprising:

- a vertical descent mounted on said gutter and comprising an upper part (26) adapted to collect water from said gutter and a lower part (28) intended to supply a water column, said upper part comprising a collecting funnel (48) said funnel comprising at least one evacuation aperture (50),

- piping means for connecting said funnel to generate sufficient pressure to feed completely said reserve up to a level of said evacuation aperture until said rainwater discharges by said evacuation aperture and flows into said lower part.

2. The device of claim 1 in which said horizontal gutter (21) is installed on the side of a house roof (22), said device comprising a descent exit (23) provided with a male reduced end (24), said upper part (26) comprising a female top (27) attached to said male reduced end, said upper part (26) further comprising an attachment circumferential (56) to said funnel and said lower part (28) comprising a lower internal pipe (37) and vertical means of attachment (46) to said funnel.

3. The device of claim 2 wherein said upper part (26) comprises a male end gutter (42) and said lower part (28) is attached to said upper part by said male end gutter,

- the attachment of a male end pipe (44) to said lower pipe (37) sealing said water column inside said pipes (37, 44), and the attachment of said

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male end gutter (42) and the lower part (28) defining an annular gutter channel.

4. The device of claim 1 wherein said evacuation aperture (50) is made at an angular slope (89) defining an upper bevel (54) and a lower bevel (52), the value of said slope being between 90 and 5 degrees upwardly.

5. A gutter descent comprising an outer shell, an upper extremity and a lower extremity, said gutter descent comprising an internal canalization within said shell and disposed along said descent, said internal canalization comprising a funnel at its upper extremity and an exit at its lower extremity, the space between said internal canalization and said external shell forming an external canalization, said internal canalization serving to convey rainwater coming from a gutter toward said exit, said external canalization serving for the evacuation of the surplus water.

6. The gutter descent of claim 5 wherein said exit comprises a faucet located inside said shell and connected to said internal canalization by means of a pipe connector(102) going through said shell,

- said outer shell being made of a solid material from a group comprising sheet metal, plastic, fibrous, composite and construction materials, said internal canalization being of plastic pipe or suitable watertight material, said funnel (48) being molded to a shape.

7. The gutter descent of claim 5 comprising a tertiary canalization comprising a pipe connected at the bottom of said internal canalization and going through said shell and closed by bleed (32, 106) means removable to facilitate the cleaning of said internal canalization.

8. The gutter descent of claim 7 wherein said tertiary canalization comprises a pipe oriented downwardly, said pipe comprising a valve

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permitting the purge of said internal canalization, said valve being activated by a handle located outside said descent.

9. The gutter descent of claim 5 comprising an upper section comprising said funnel, and a lower section comprising said exit, said upper and lower sections being connected by two joints: an external shell joint and an internal canalization joint, any intermediary section likewise;

- a joint between an upper section and a lower section of said gutter descent comprising an external shell and an internal canalization, said joint comprising an internal joint (44, 46) and an external joint (42, 43), said external joint comprising a slightly closed tip at the bottom of said shell of said upper section and being inserted at the top of said external shell, defining a female end gutter (43) of said lower part, said internal joint comprising a male internal component (44) exceeding said closed male end gutter (42) tip and being of a size permitting the insertion at the top of said internal canalization of a female end pipe (46), said top of said internal canalization coinciding with said top of said outside shell, so that when installing, said male tip is first inserted in said internal canalization of said lower part followed by the insertion of said tip (42) at said top (43) of said outside shell.

10. An internal canalization for installation inside a rainwater gutter descent, said internal canalization comprising an upper part in the shape of a funnel, followed by an elongated canalization located below said funnel toward the bottom, and connection means (72) for adapting to a delivery pipe positioned at a lower end thereof, thereby providing hydrostatic pressure for utilization or accumulation of rain water into a reserve, said internal canalization comprising overflow apertures (50) to

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discard water when a hydrostatic column fills itself to the top faster than it drains.

11. A gutter descent intended to allow the canalization of rain water toward a reservoir for subsequent use, said gutter descent comprising an outside shell (26,28), an upper part (26) thereof being installed at a gutter exit (23), a descent exit (38) being at a lower extremity thereof, said gutter descent comprising an internal canalization comprising a funnel (48) set inside and at the top of said shell, an internal pipe (37) with two extremities set along said descent, a first extremity thereof set to collect said water from said funnel, an aperture made in said funnel, a lower part (28) of said outside shell joining said upper part (26) and a valve (40) located on said lower part to control the water flow outside said internal pipe, when it rains, the water being conveyed from a roof by said gutter exit, toward said descent, sliding down said funnel, through said straight pipe, then through said internal pipe, an exit thereof evacuating water when said valve is open, wherein water is filling said internal pipe when said valve is closed, until overflowing said aperture (50), to flow between said internal pipe and said outside shell, then being evacuated from said descent toward the bottom.

12. The descent gutter of claim 11 wherein said straight pipe is equipped with a faucet (30) playing the role of said valve (40), and wherein a hose (64) is installed on said faucet, said hose conveying the water from said faucet to a place of utilization,

- wherein said place of utilization is a reservoir intended to collect rainwater, and wherein said reservoir fills up thanks to the water pressure generated by the filling of said hose of said lower pipe, or from

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the water column constituted subsequently by the filling of said straight pipe,

- the gutter descent comprising in addition a bleed cap (32) located at the bottom of a drain pipe (62) and which allows the draining of said internal canalization of debris such as sand, leaves or branches.

13. The internal canalization of claim 10 wherein said gutter descent comprises two sections connected by a joint: an upper part and a lower part, an interior joint joining the upper part to said lower part, and an exterior joint joining the upper part of an outside shell to the lower part of said shell,

- said internal joint comprising an upper component of a smaller diameter than a lower component so as to create a male-female junction, said upper component inserting in said lower component,

- said external joint comprising a closed connector at the bottom of said outside shell of said upper part, so as to be inserted at the top of said outside shell of said lower part,

- an upper extremity of said lower component coinciding with an upper extremity of said lower shell, to allow the adjusting of the length of the lower part to be done with a cut line cutting simultaneously shell and pipe, and wherein the installation consists of aligning the exceeding extremity of said component with the lower pipe, to then insert said closed connector in the lower shell.

14. A method for modifying a gutter descent attached to a gutter exit, to collect rainwater, said method comprising the following steps:

- removing the higher end of said gutter descent and connect a funnel captor to said gutter exit,

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- connecting a conduit to said funnel captor, to a height defining a hydrostatic column

- connecting the bottom part of said conduit to a pipe transporting said water to a reserve,

- filling said reserve to a level of said captor,

- providing said captor with overflow apertures to overflow said water when said hydrostatic column fills itself to the top faster that it drains to said reserve at the bottom,

- providing a shell to cover said gutter descent to a suitable appearance.

15. The gutter descent of claim 9 wherein coupling means between said internal joints (44,46) is reversible, internal component male end pipe (44) being surrounding female end pipe (46).

16. The gutter descent of claim 11 wherein said funnel (48) has an interchange head (47) of a shape among a group comprising square, rectangular, oval, round.

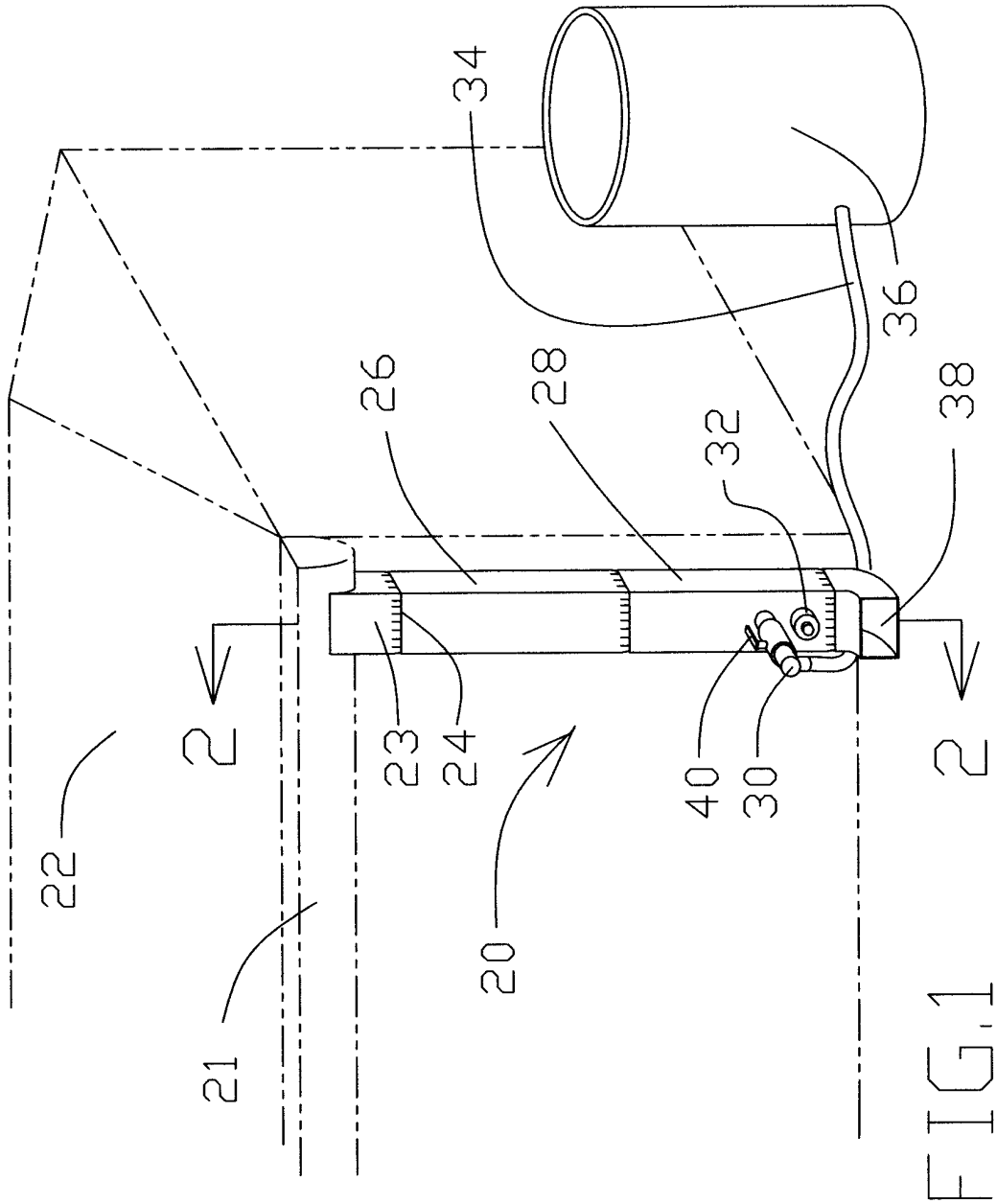


FIG.1

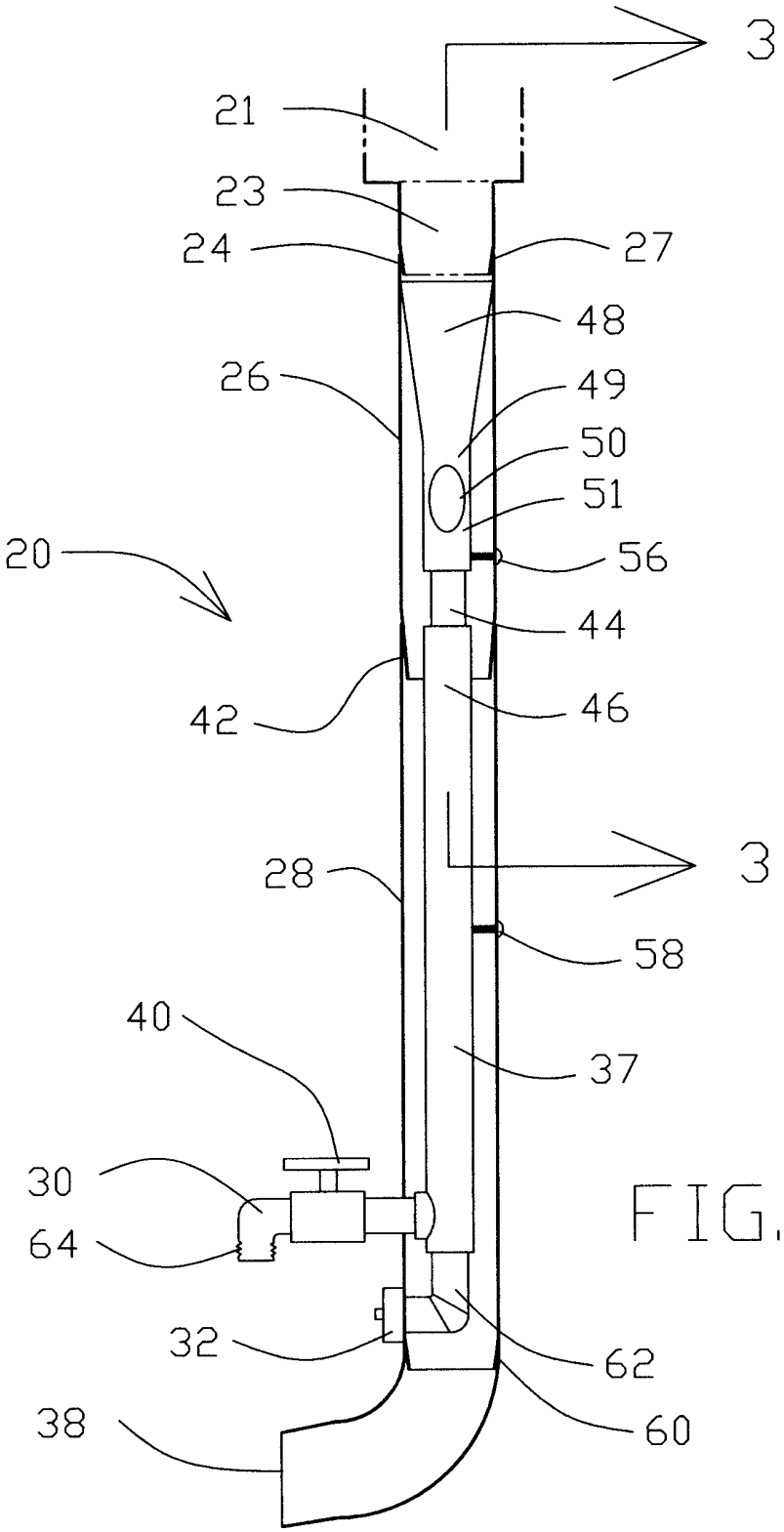

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FIG.2

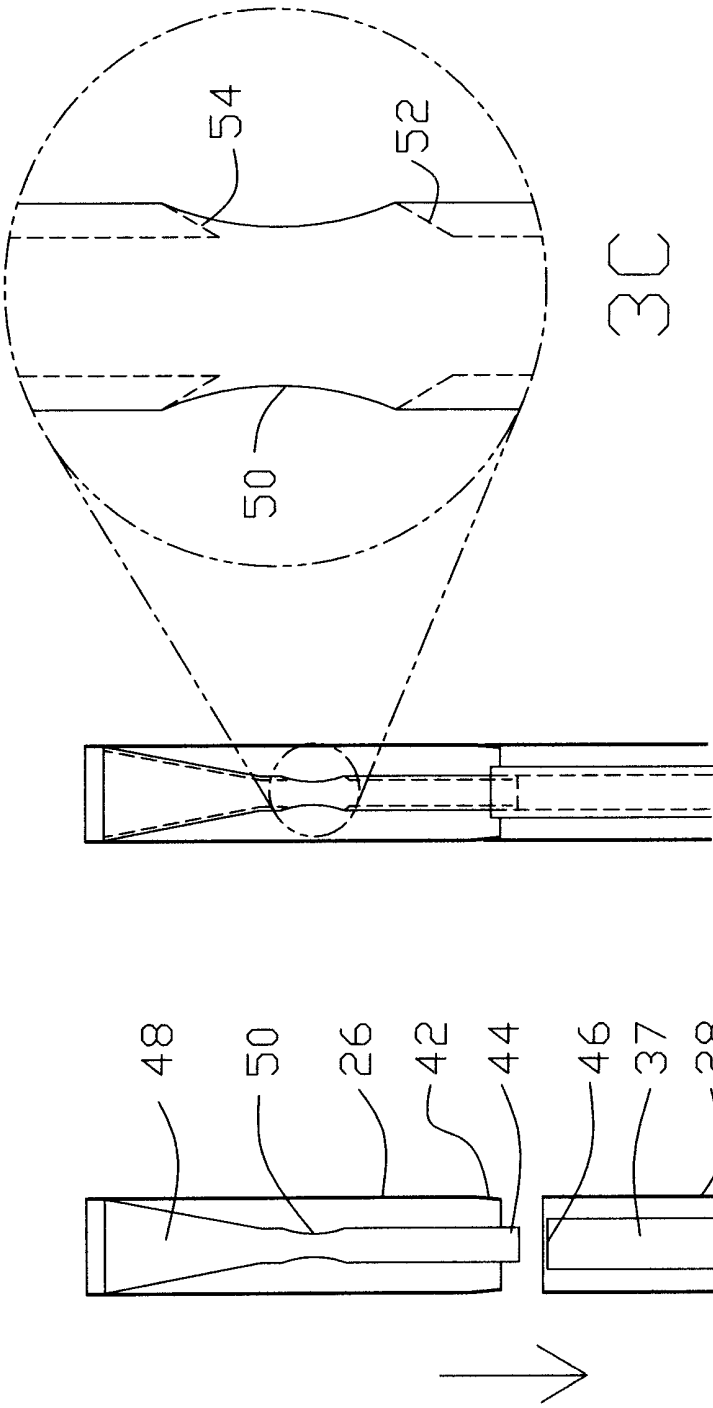


FIG.3

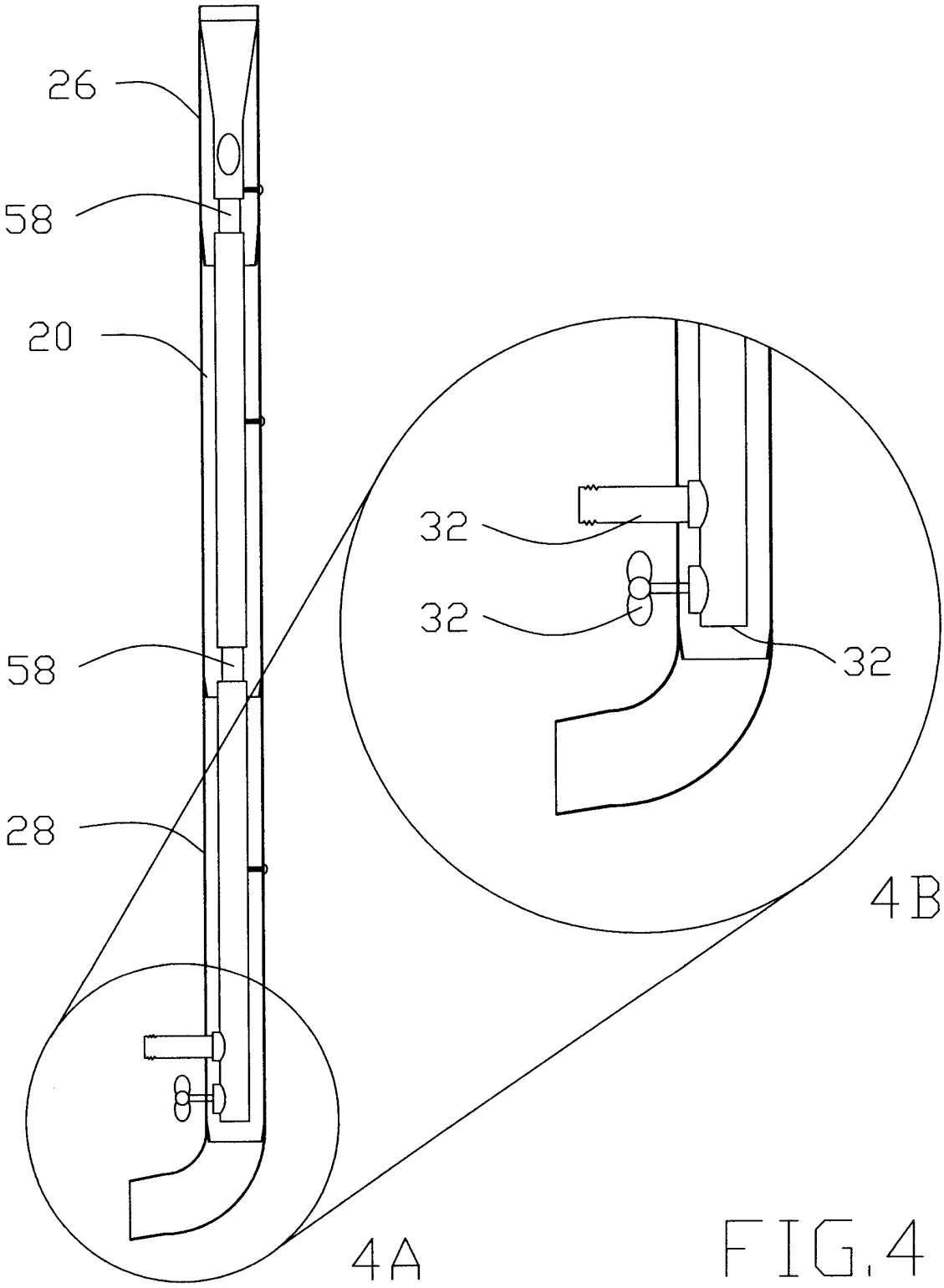


FIG.4

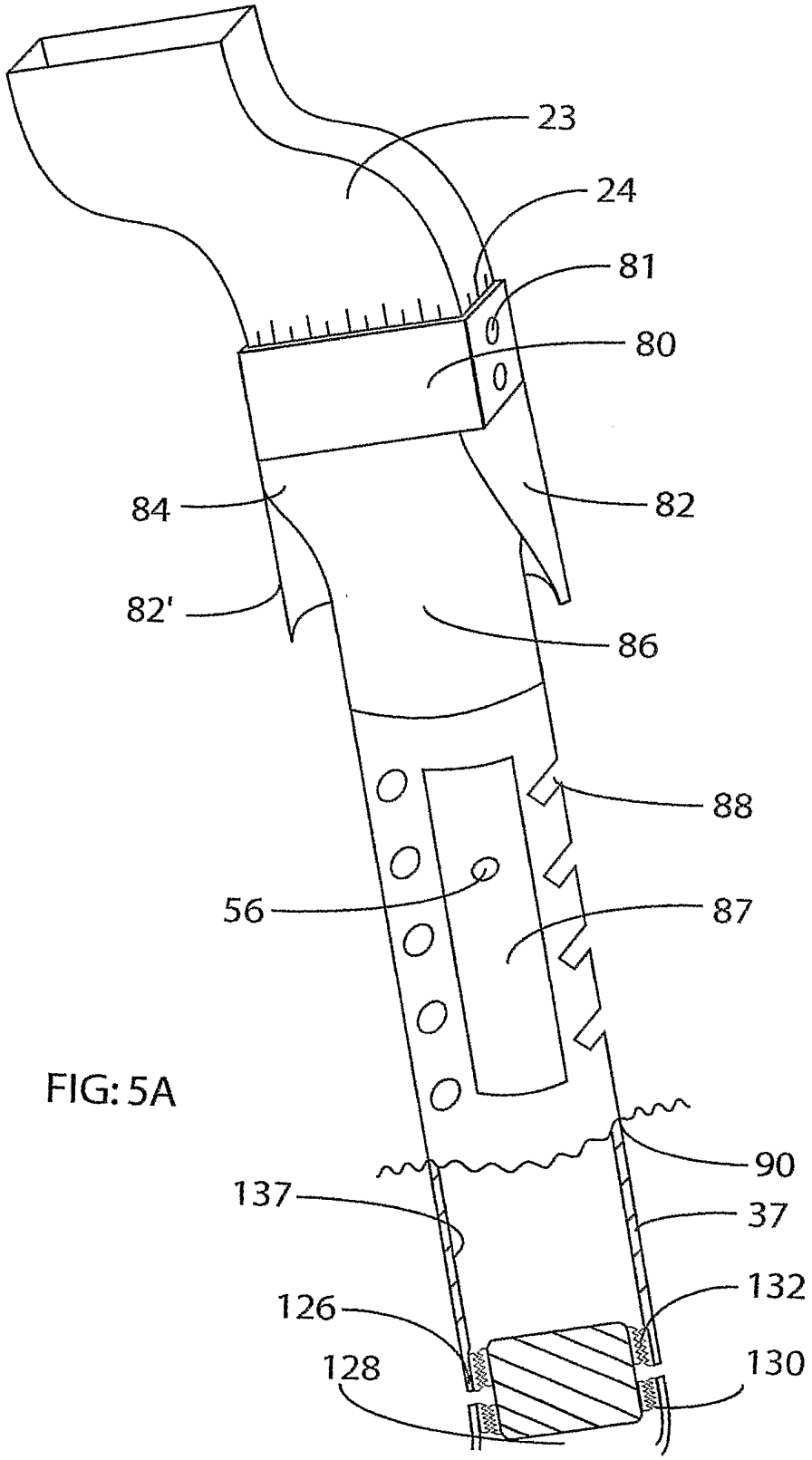


FIG: 5A

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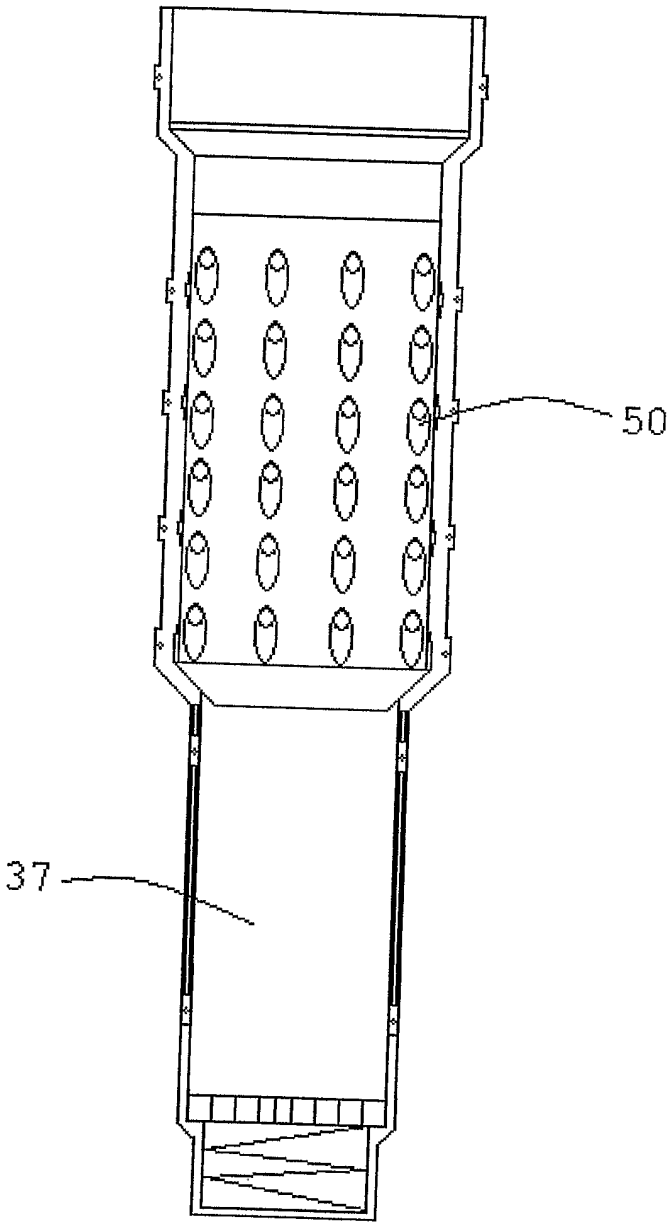


FIG. 5B

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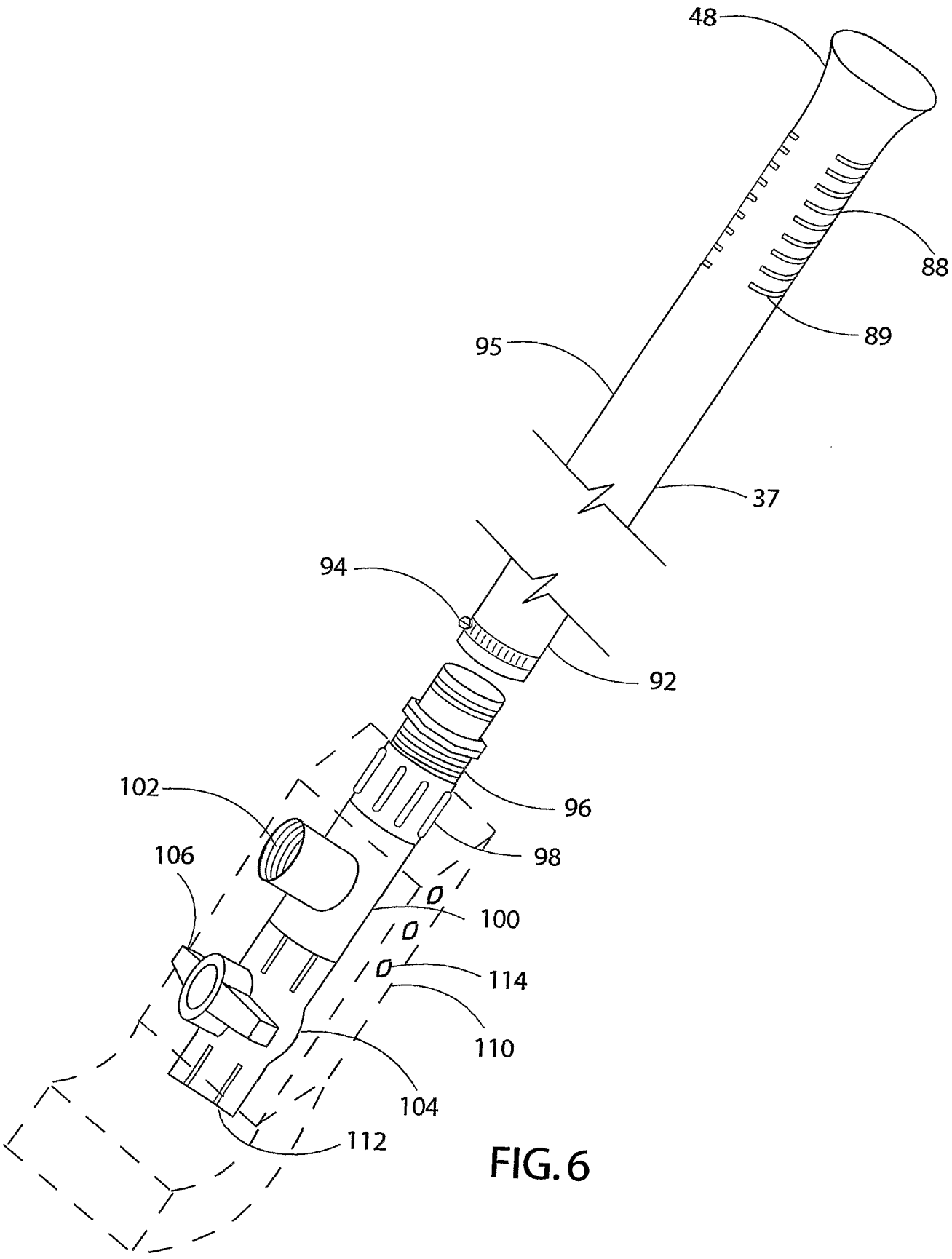


FIG. 6

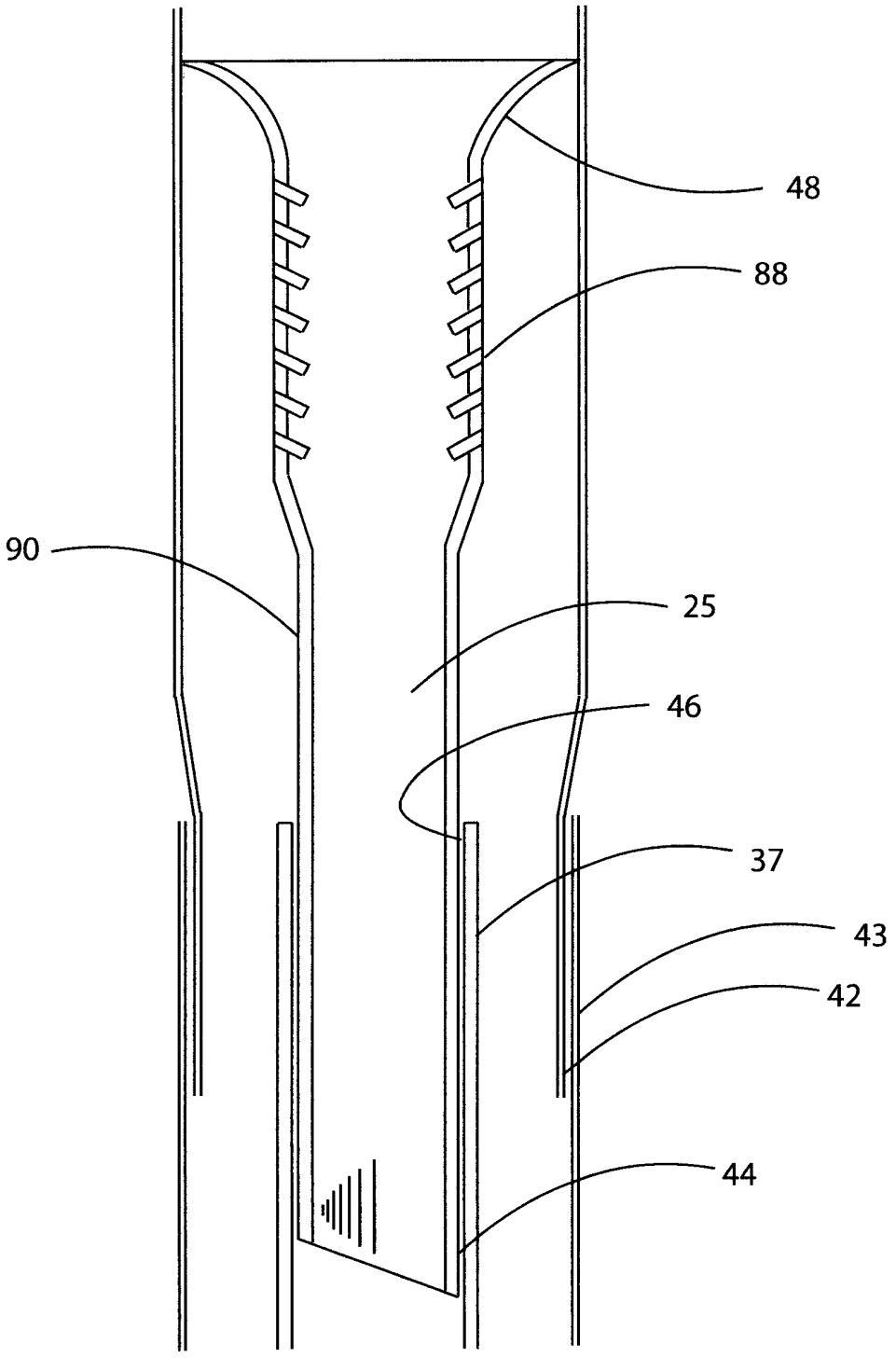


FIG. 7A

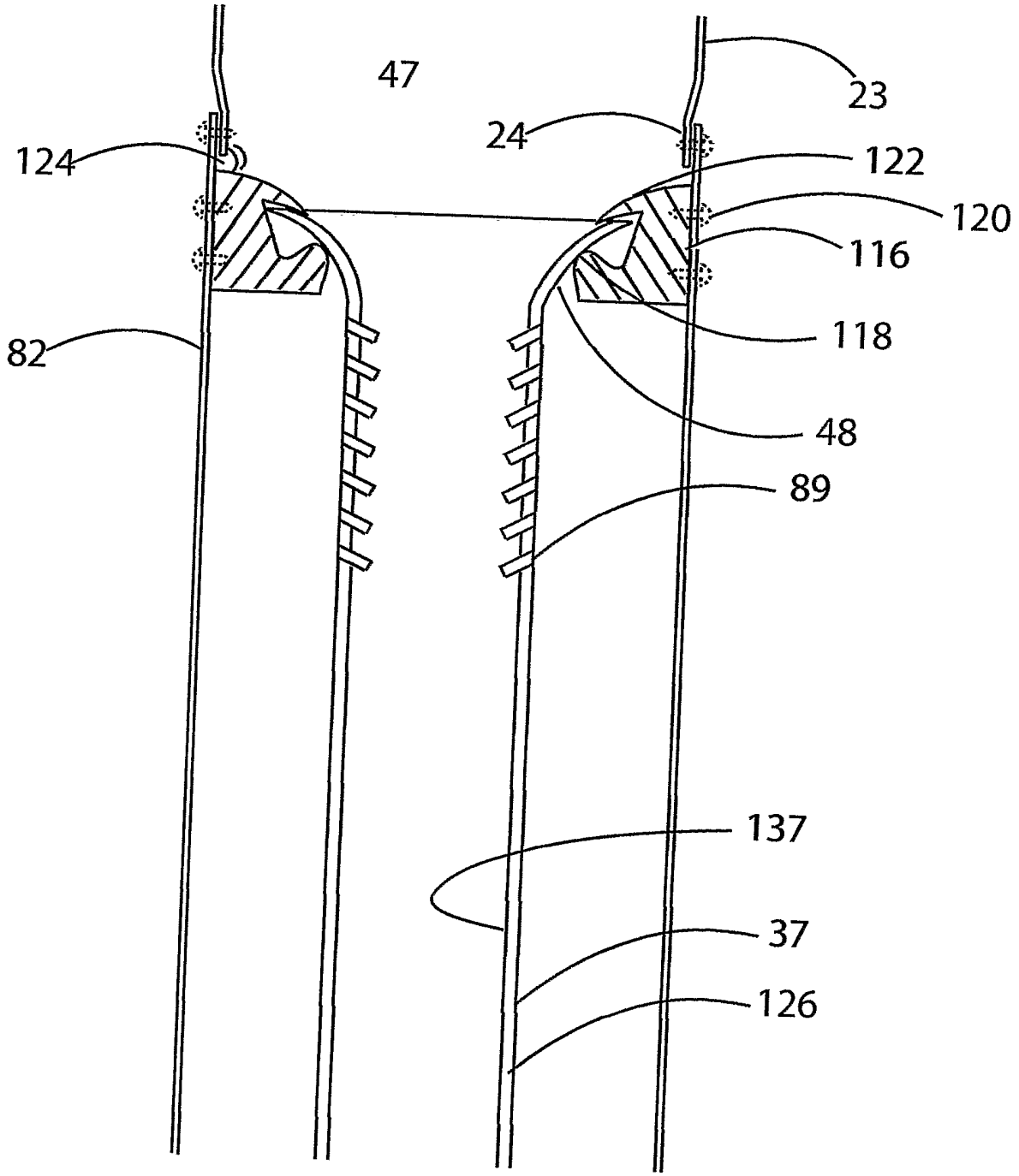


FIG. 7B

SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2006/000773

A. CLASSIFICATION OF SUBJECT MATTER

IPC: ***E03B 3/02*** (2006.01) , ***E04D 13/04*** (2006.01) , ***E04D 13/08*** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: ***E03B 3/02*** (2006.01) , ***E04D 13/04*** (2006.01) , ***E04D 13/08*** (2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

USPTO, Espacenet, CPD, Library & Archives Canada-patents, Internet; keywords: gutter, descent, down/spout/pipe, funnel, cone, rain/water, harvesting, collector (singly or in combination, with or without class, as appropriate).

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 3,537,609 A1 (HESS, P.) 12 February 1987 (12-02-1987) (see the whole document)	1, 4, 5, 10, 14
X, P	CA 2,466,886 A1 (DUSSAULT, Y. et al.) 19 November 2005 (19-11-2005) (see the whole document)	1 to 16
X	Rainwater Harvesting And Utilization (United Nations Environment Programme) March 2002 (xx-03-2002) www.unep.or.jp/Ietc/Publications/Urban/UrbanEnv-2/6.asp (see: "Conveyance Systems", figure therein)	1, 4, 5, 10, 14

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 August 2006 (29-08-2006)	25 September 2006 (25-09-2006)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Edward Dabrowski (819) 953-1378

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
DE3537609 A1	12-02-1987	NONE	
CA2466886 A1	19-11-2005	NONE	