

THE JOINT EXAMINATION BOARD

PAPER P3 – Preparation of Specifications for United Kingdom Patents

Thursday 5th November 2009

10.00 a.m. – 2.00 p.m.

*Please read the following instructions carefully. Time Allowed – **FOUR HOURS***

1. The whole question is to be attempted.
2. Marks to be awarded are given at the end of the question.
3. Please note the following:
 - a. Enter the Paper Number (P3) and your Examination number in the appropriate boxes at the top of each sheet of paper;
 - b. The scripts are photocopied for marking purposes. Please write with a **dark inked pen** on one side of the paper only and within the printed margins, and do not use highlighters in your answer;
 - c. Do not state your name anywhere in the answers;
 - d. Write clearly, examiners cannot award marks to scripts that cannot be read.
4. Under the Examination Regulations **you may be disqualified from the examination and have other disciplinary measures taken against you if:**
 - a. you are found with unauthorised printed matter or other unauthorised material in the examination room;
 - b. your mobile phone is found to be switched on;
 - c. you copy the work of another candidate, use an electronic aid, or communicate with another candidate or with anyone outside the examination;
 - d. you continue to write after being told to stop writing by the invigilator(s). **NO WRITING OF ANY KIND IS PERMITTED AFTER THE TIME ALLOTTED TO THIS PAPER HAS EXPIRED.**
5. **At the end of the examination assemble your answer sheets in question number order and put them in the WHITE envelope provided.** Do not staple or join your answer sheets together in any way. Any answer script taken out of the examination room will not be marked.
6. This paper consists of nine pages, including this page, and comprises two pages of the question, three sheets of client's drawings and a further set of the drawings for use in your answer.

Your client sends you the attached drawings with the following note.

'As you know, I specialise in survival equipment for military aircraft crew. One of my key items is a crewman's survival dinghy. The inflatable dinghy is stowed with an ejector seat, from which it separates during descent after ejection, but remains attached to the aircrewman's parachute harness. Upon hitting water, the dinghy inflates automatically, the aircrewman pulls open the quilted canopy (which is also inflated to provide rigidity and extra buoyancy), and scrambles inside.

Inevitably a fair amount of the water enters the craft with him and he used to have a pan-shaped fabric scoop with a wire surround, with which he could use as a bailer to scoop up the water and throw it over the side through the open canopy, and also a sponge with which he could then clean up the last remaining puddles. You will understand that the bailer and the sponge occupy little bulk or weight in a context where weight and space availability are at a premium. They were stowed in a convenient pocket inside the dinghy.

Of course in stormy conditions the wind might blow water into the craft, through the opened canopy, at least as fast as the man was trying to bail it out, and he was moreover exposed perhaps to a chilling wind, with its risks of hypothermia.

As you can see in the drawings, the traditional bailer is replaced with a through-the-dinghy-floor drainage device, formed of the same rubberised fabric as the dinghy itself (i.e. a synthetic rubber reinforced with a woven fabric). If you look at the bigger drawing showing a cross section through the drain, there are two valves, one extends across the mouth of the trunk at the base of the funnel and the other is formed at the bottom of the trunk, below the dinghy floor. Both act as non-return valves to allow water to pass out, through the dinghy floor, but prevent the return of water into the dinghy. The valves are rotated relative to one another as you look down the trunk from above.

The device is sited so that it would be between the thighs of the occupant (the dinghy is quite small of course, and the occupant sits with his legs stretched out in front of him). Thus he can raise the funnel mouth up from the dinghy floor, catching water within it. As the dinghy is tossed around the water will drain down through the non-return valves. Normally, the aircrewman will use something like a peristaltic motion on the trunk of the drainage device. He can squeeze the trunk at the top with his free hand and slide his hand down to urge the water down and out past the lower valve. Having two valves helps this, as the water will flow past the first valve, which is being held above the dinghy floor, quite quickly, and is then trapped below it and can be pumped out past the lower valve by squeezing the trunk.

The funnel mouth is reinforced with a plastic or metal ring which both maintains a circular shape at the funnel mouth and assists in manipulating it. It is about big enough to be used one-handed.

Even a well trained crewman can get a bit panicky when the dinghy is filled with water and so he is likely to pull hard on the funnel mouth as he repeatedly lifts it up and down to refill it with water. So I have added reinforcing straps which extend up the trunk and across the dinghy floor at the base of the trunk. These can be glued or sewn in place.

The non-return valves are based on a fabric valve I saw used in a waste outlet for a sink when I did my army service 30 years ago. A cylinder or cone of material is

flattened at one end and stitched along the edges there to hold it flat. Water feeds into the mouth at the other end and trickles down between the facing panels of material. Water cannot get back up between the panels in any significant amount because the pressure of the surrounding water squeezes the panels together.

Obviously I could use other types of non-return valve, but these work well enough, and there are benefits in making everything of the same material – lightness, cost, ease of construction, no moving parts, etc.

There is a cover, secured by a fastener, such as 'VELCRO', under which the rolled up device is stowed while not in use. This provides added security against water ingress after bailing out the dinghy. The sponge, which they still use, is also placed under those stowage flaps.'

I could retrofit my baler device to existing dinghies, in fact I want to do this as it is not good for aircrew to have to cope with different designs, and I can charge a premium for doing it.

I am flying to the USA today to demonstrate the modified dinghy to customers tomorrow, so I will be out of contact for a while. Please file a UK patent application for me today.'

You are to draft a full patent specification for filing as a UK patent application at the United Kingdom Intellectual Property Office, with Abstract and Claims.

You are aware that ships have bilge pumps (manually or electrically operated pumps for pumping water from the hold of the ship and out through the side of the ship above the waterline). Also, small boats have drain holes, which are unplugged to allow water to drain out when the boat is lifted from the water.

Marks will be allocated as follows:

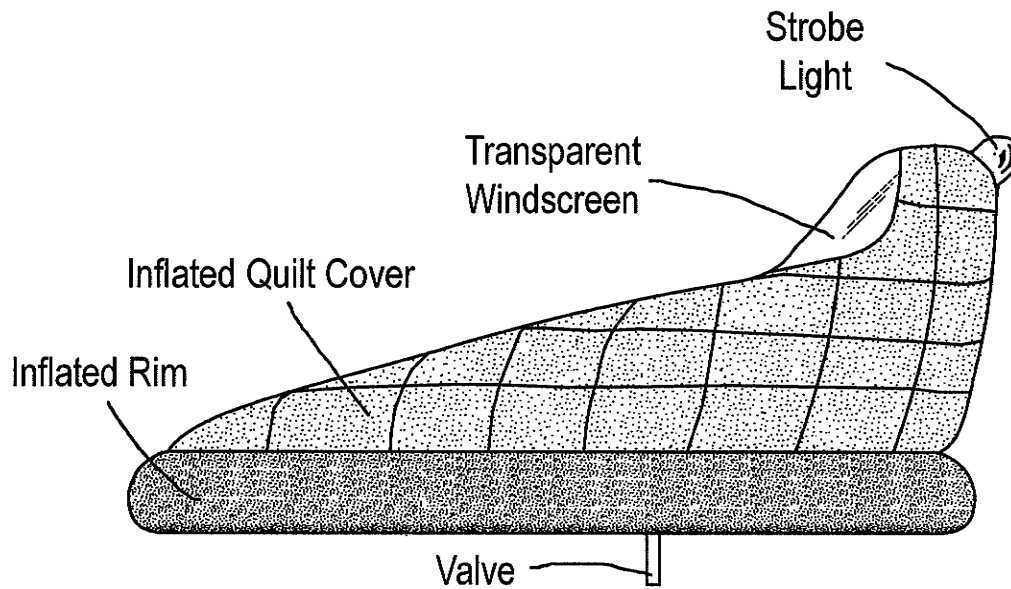
Independent Claim(s) 40

Dependent Claims 25

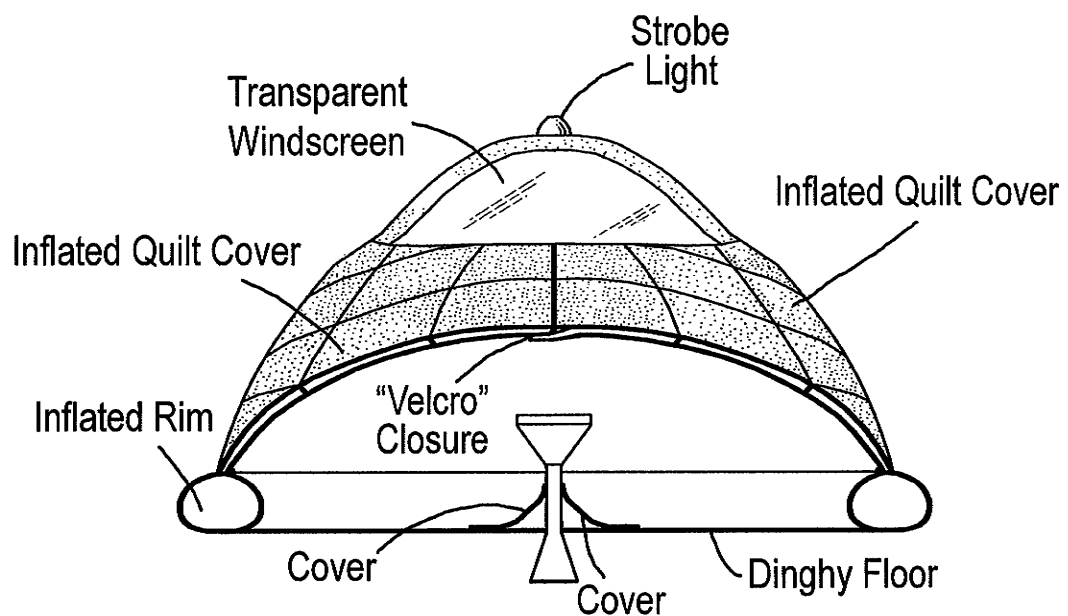
Introduction and Specific Description 30

Abstract 5

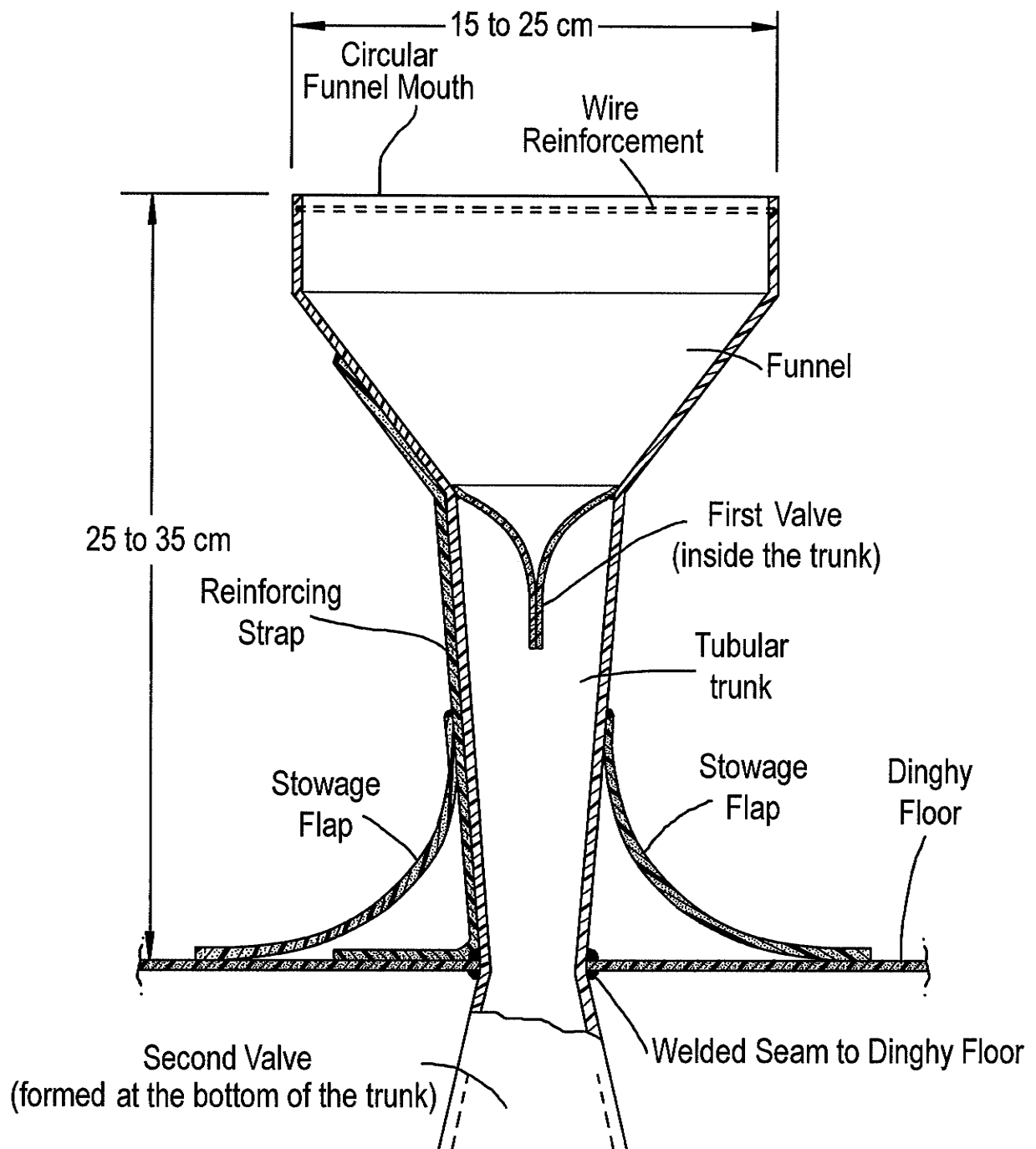
Side View of Dinghy



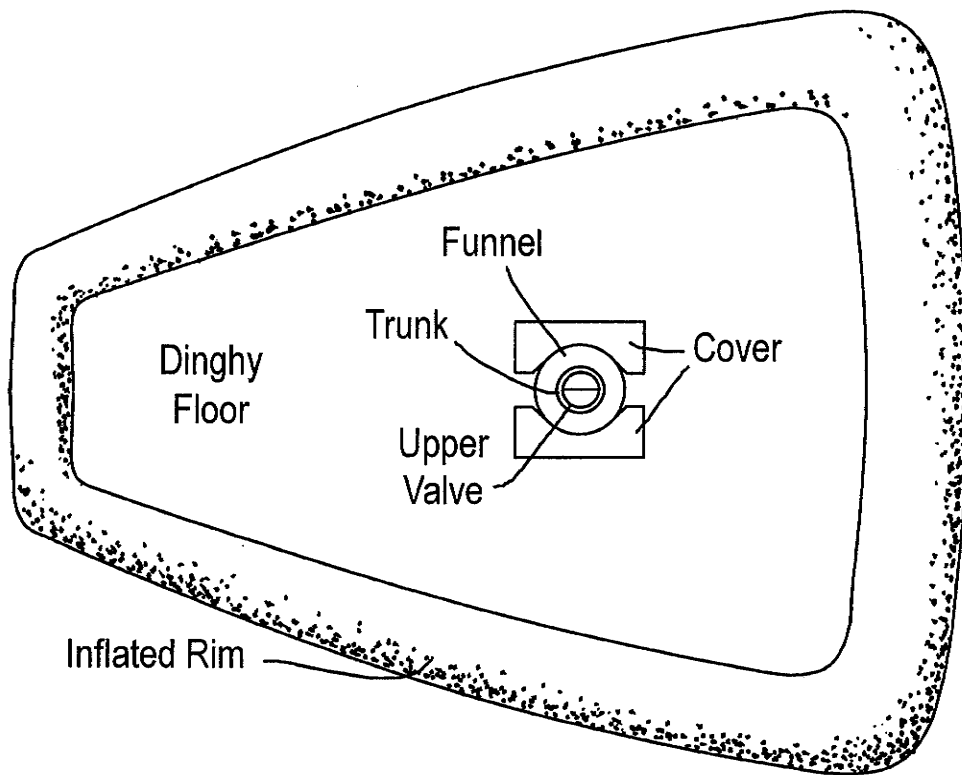
Cross-Section of Dinghy



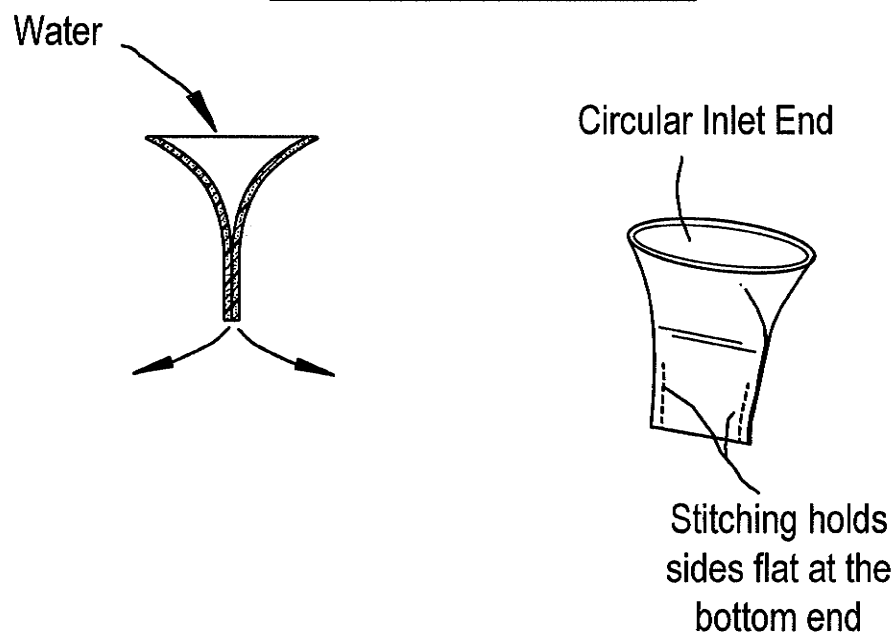
Dinghy Drain



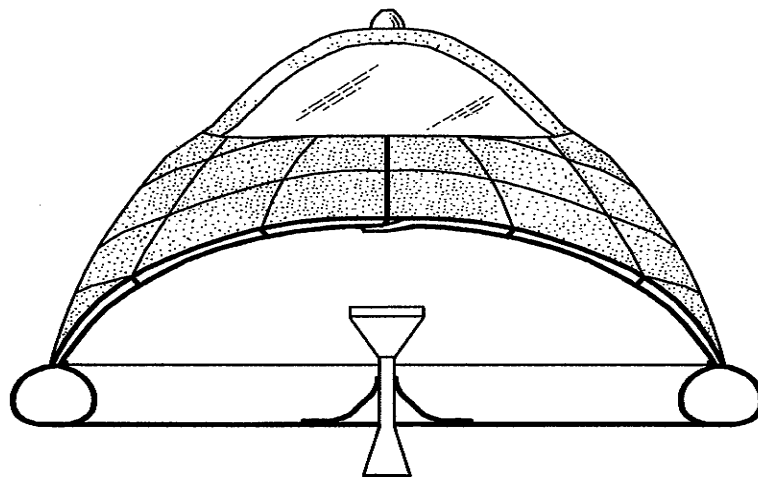
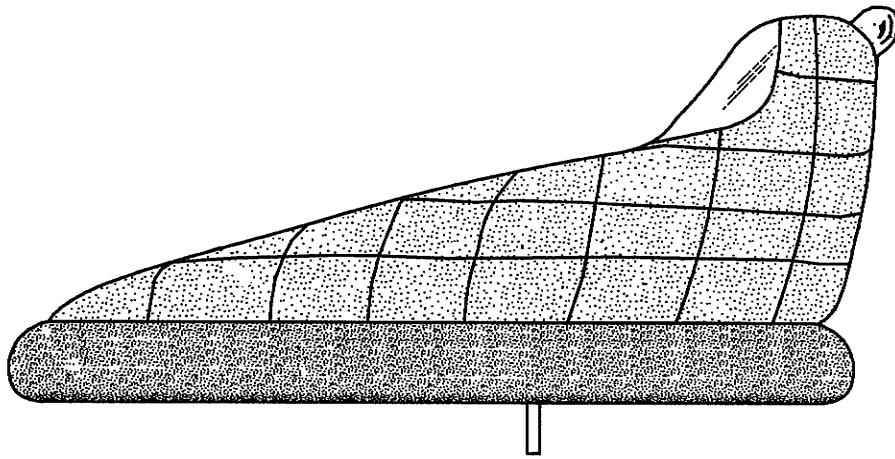
View of Dinghy Floor from Inside



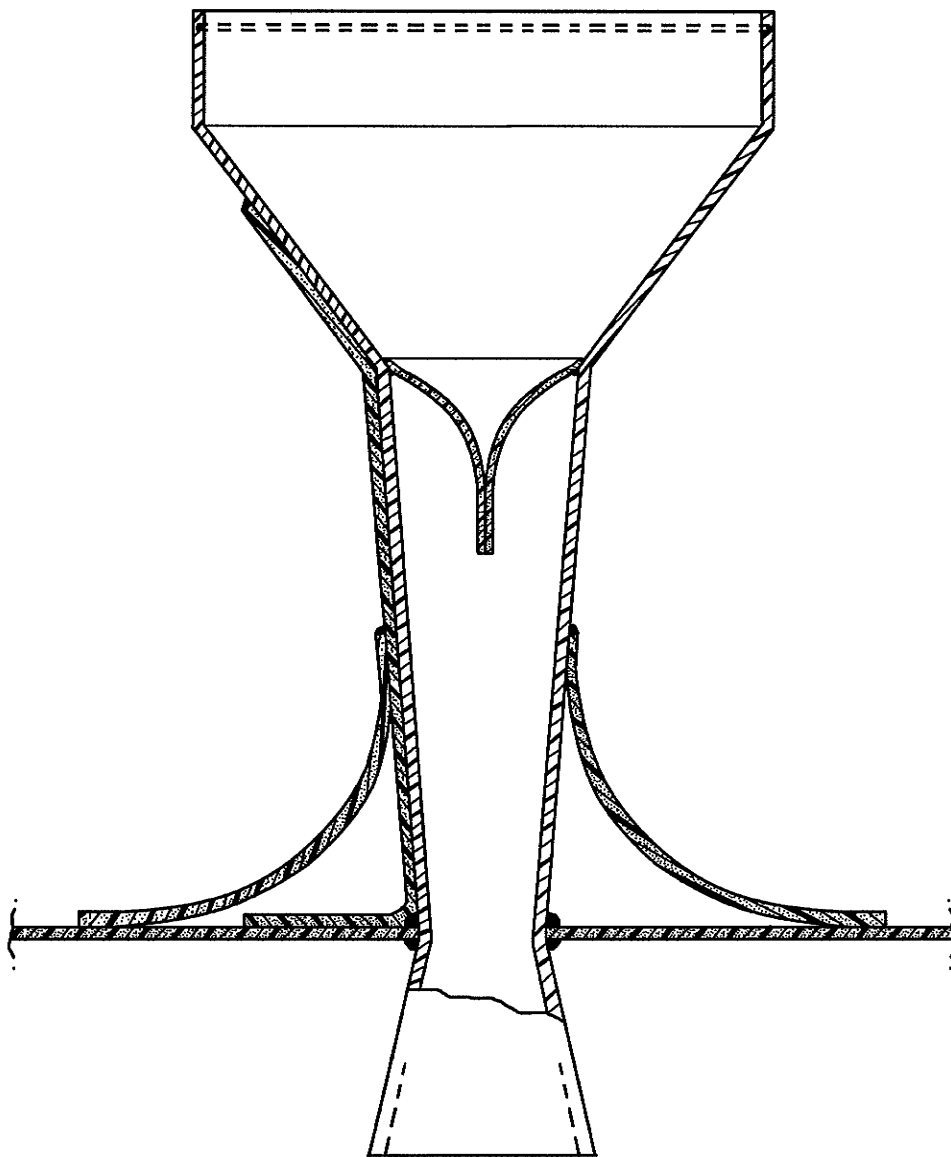
Typical Non-Return Valve



Candidate No.



Candidate No.



Candidate No.

