PATENTS EXAMINATION BOARD

Subject: The Drafting of Patent Specifications - Paper 2

Date: July 2018

Time: 09h00 -13h00 (although candidates requiring extra time are entitled to an additional two hours)

Examiners: J Fiandeiro
V Williams

Moderator: J D Whittaker

Attached is an instruction from your client detailing an invention.

You are required to draft a full patent specification for your client's invention. The full patent specification must include: (1) a background to the invention, (2) a summary of the invention, i.e. consistory clauses, (3) a brief description of the drawings, (4) a detailed description of the invention, (5) a set of patent claims, and (6) an abstract.

Marks will be allocated as follows:

- 50% of the marks will be allocated to the claims.
- 50% of the marks will be allocated to the rest of the specification.

In order to obtain a pass for this paper, candidates must obtain not less than 40% for each of these two sections.

Your client writes:

“I have developed a way of repairing cracks and holes in pipes, such as large diameter water, fuel or gas underground pipes. More specifically, my invention relates to the repair of such pipes when the exact site to be repaired is either unknown or unreachable.

To conduct water, fuel or gas over large distances, pipes that span immense lengths are installed. Occasionally, due to corrosion, for example, small cracks may form in the wall of a pipe, resulting in a leakage of the fluid flowing through the pipe. Since the pressure in these pipes is often very high, the fluid may leak rapidly into the ground.

A leakage is usually discovered by a sharp pressure drop, or by the visual observation of escaped fluid in the ground above the leakage location, both indicating that a large amount of fluid may already have been lost. Such leakages can be detrimental to the environment and cause significant financial losses.

The repair of an underground pipe poses a series of complicated technical and practical problems, including accessibility, which is particularly true when dealing with very long pipes and pipes that are underneath buildings and roads. Also, due to the high pressures within these pipes, patching of the outside of the pipe wall is not an option.

The aim of my invention is to provide a quick and effective method of repairing pipes.

With reference to the attached drawings, Figure 1 shows a length of pipe 10 buried in the ground G. The pipe 10 has a leak at location L, typically due to a hole H. The first step in repairing the leak is to shut off the flow of fluid through

the pipe 10 by closing an upstream shut off valve 12, and then digging away the ground over the pipe 10 at two convenient locations A and B, on either side of the leakage location L.

At each location A and B, the pipe 10 is torch-cut to form a first circular opening 14a and a second circular opening 14b, respectively, both of a diameter equal to that of the pipe 10. Pipe sections 16a and 16b are welded or otherwise affixed to the pipe 10, as shown.

In the next step (shown in Figure 2A), a first spherical body C1 is inserted through the pipe section 16a into the pipe 10. Immediately thereafter, a viscose sealing material M1 is injected into the pipe 10, followed by a second spherical body C2 (see Figures 2B and 2C). The bodies C1 and C2 are preferably made of a semi-rigid material, such as polyurethane, so that they may easily pass through the pipe 10, which may have bumps and protrusions along its inner surface.

The sealing material M1 is then compressed, typically by applying pressure to the bodies C1 and C2 from opposite sides. In this regard, the pipe sections 16a and 16b are closed and a pressurised fluid is pumped into the pipe 10 to press the bodies C1 and C2 against each other, thereby compressing the material M1. A first pressure P1, through pipe section 16a, is slightly greater than a second pressure P2, through pipe section 16b, such that the pressure difference causes the combination of C2-M1-C1 to move in unison from 16a to 16b. As this combination travels through the pipe 10 (see Figure 2D), the compressed sealing material M1 expands into the hole H in the wall of the pipe 10. In a short period of time, the sealing material M1 solidifies and hardens to fill and seal the hole H.

As the bodies C1 and C2 continue to travel through the pipe 10, they may be retrieved through pipe section 16b, as shown in Figure 2E. The pipe sections

16a and 16b are then removed and replaced by covers 18a and 18b of any conventional type, as shown in Figure 2F. The repair process is now complete.

Please prepare a patent specification for my invention.”

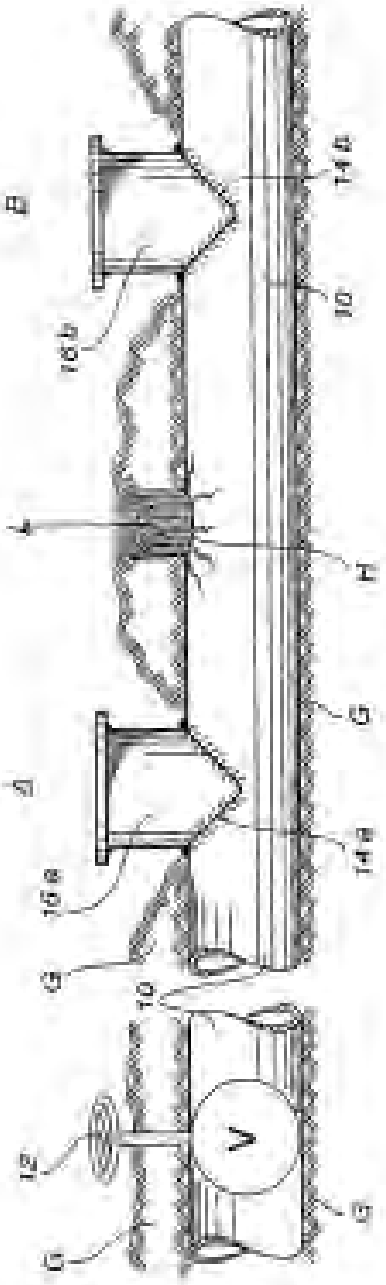

FIG. 1

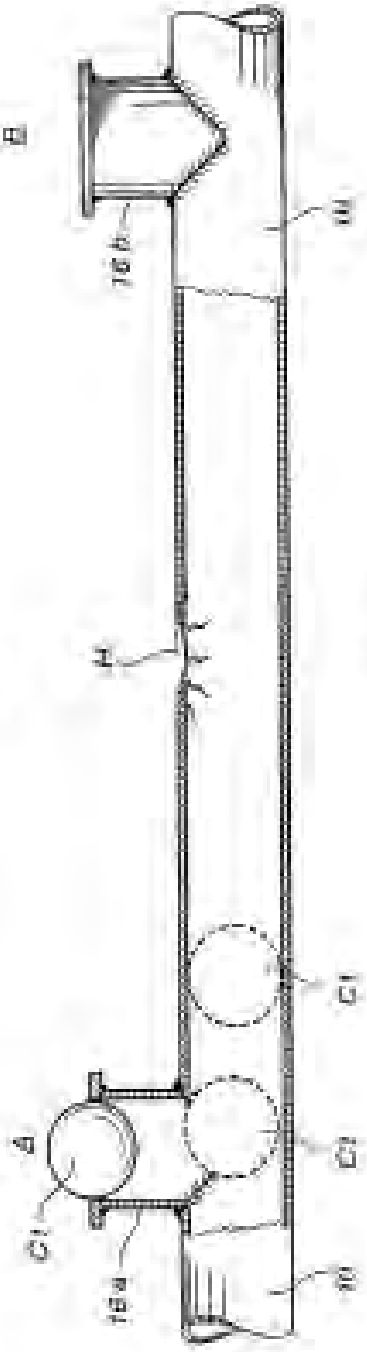

FIG. 2A

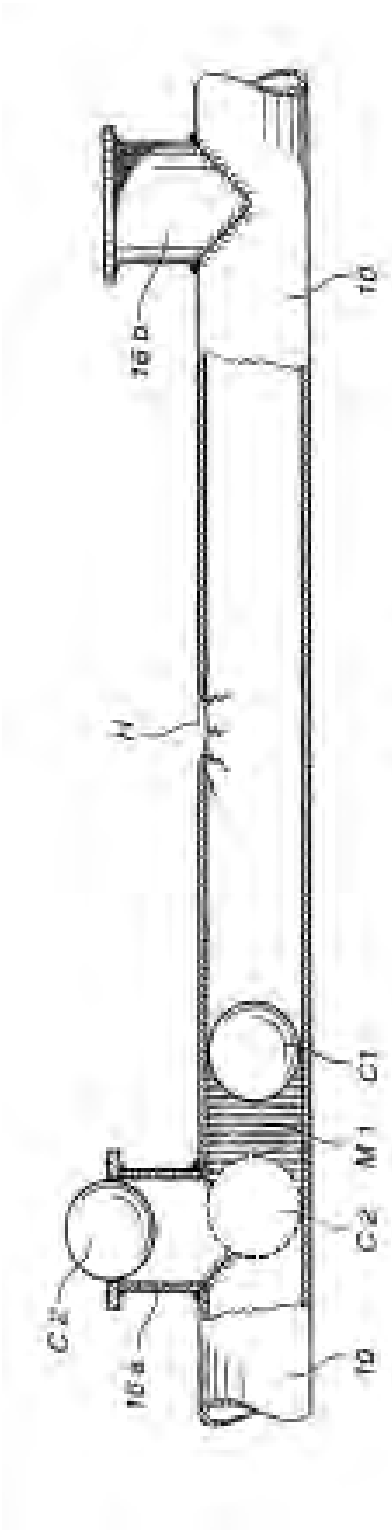

FIG. 2B

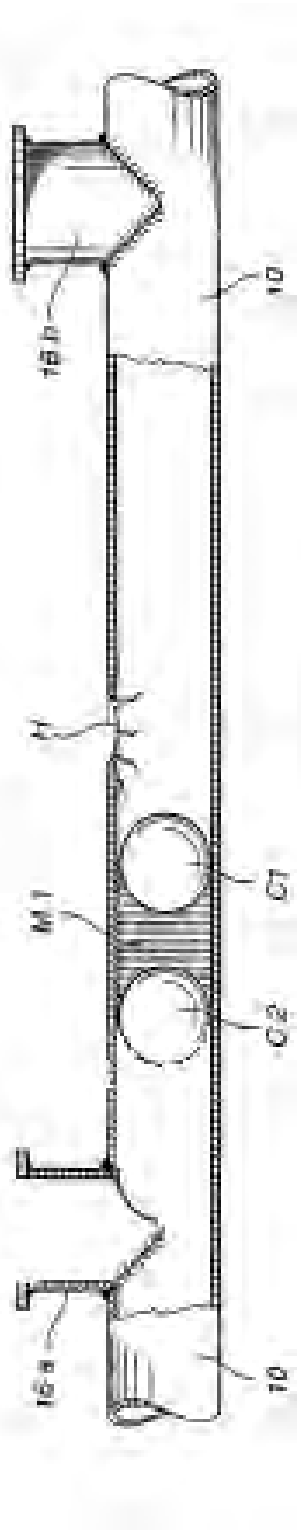

FIG. 2C

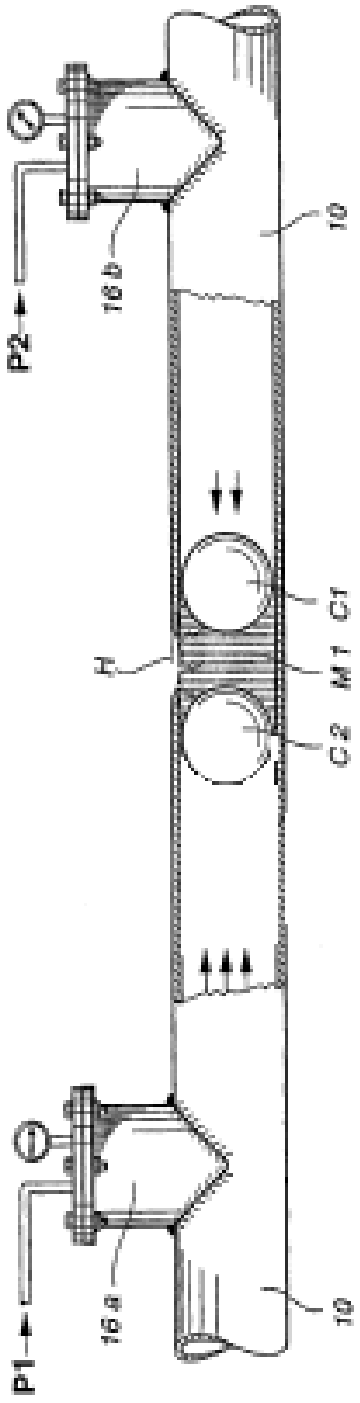

FIG. 2D

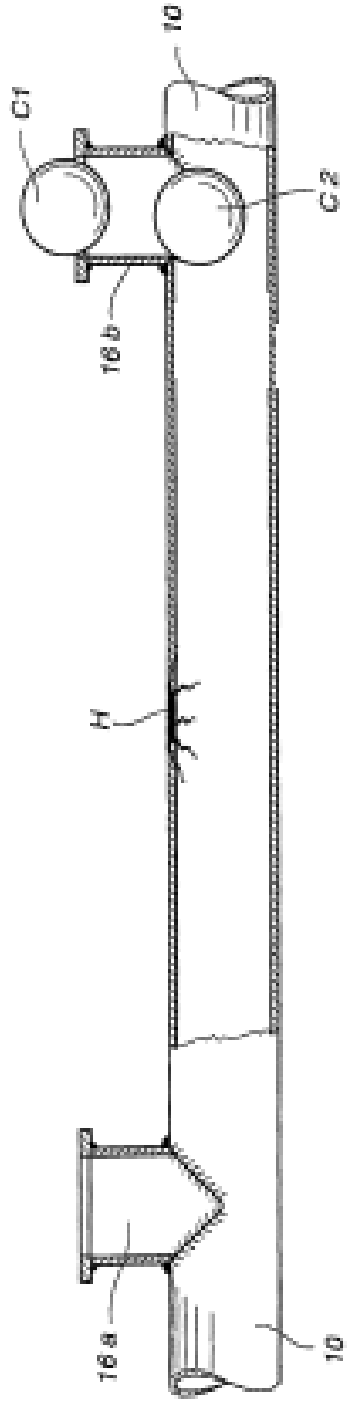

FIG. 2E

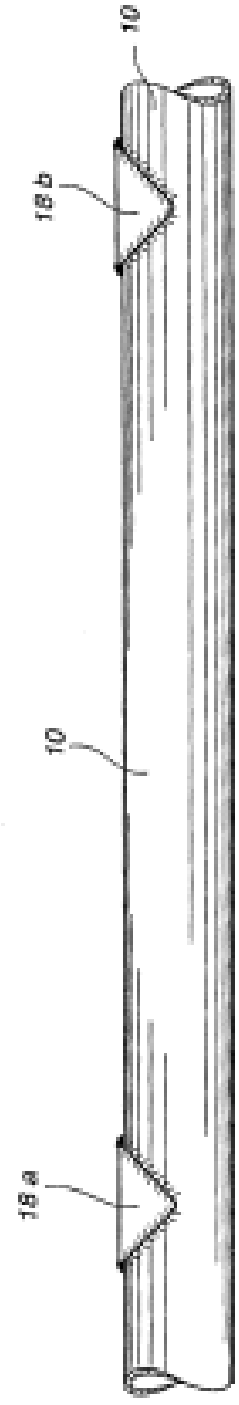

FIG. 2F