THE JOINT EXAMINATION BOARD

PAPER P3

Preparation of Specifications for United Kingdom Patents

Thursday 6th November 2008

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 six pages, including this page and comprises three pages of the question, one sheet of client's drawings and one further sheet of drawings for use in your answer.

You arrive in the office and find a letter from your client, Mr Hertz, which reads as follows:

"As you might recall, I mentioned during a previous meeting that I install computer networks in buildings. Well, I have noticed that I never have the correct length cables to connect the socket on the computer with the network socket (which is typically provided on the building walls or in a floor outlet). Network cables have a standard type of plug at each end and come in a variety of different standard lengths (1m, 2m, 5m etc.), and so I need to carry with me a selection of each of these and then choose the most appropriate one for the job. I always have to choose one which is slightly longer than required and then I have to somehow tidy up the excess (usually by using cable ties to bundle the cable up), which is unsightly and time-consuming.

I thought that there must be a smarter solution to this.

I tried forming a network cable into something similar to a conventional coiled extension cable (where the cable itself is formed into a helical coil which can be pulled on to stretch it to the appropriate length, and the coil goes back to its original length when the tension is removed). I used these at some clients' offices, but they proved not to be suitable for network cables as they keep popping out because the connectors are not intended to be under constant tension.

After some tinkering, I arrived at a design as shown in the attached drawings. This device is formed of two transparent circular parts. The inner part or spool has some finger or thumb holes on its face to help with winding, as well as some bumps on the rim which lock into some depressions on the outer part or cover to help fix the cable at the selected length. The inner part has a moulded pin in the centre, which has an enlarged end and a slit into which the network cable is placed. Although any sort of cable should work, flat cross section cables (ribbon cables) are particularly well suited, as explained below.

After the cable has been put in the slit in the central pin, the slots in the side wall of the outer part are lined up with the cable and the outer part is snap fitted on top. The outer part is held in the palm of one hand, and then you rotate the inner part using the finger holes. The pin anchors the cable and so the cable is wound up around the pin.

Vertical ridges are provided around the outer surface of the outer part to also help with winding.

The moulded pin fits into a hole on the outer part. The pin is slightly compressed as the thickened end fits through the hole and then springs out again, the end then holding the two parts together.

The slots are positioned so that the cable ends exit the device on opposite sides and the cable can run freely through them. I suppose you could have them at other angles or even have only one slot. The edges of the slots can be rounded to help the cable run through them.

People have tried to provide extendable network cables before. You will be familiar with a conventional wound electrical extension system, where a mains power outlet socket is provided on a drum. The socket rotates as the cable and the mains plug (a three pin plug) is unwound from the drum. With the extendable network cable, the socket on the drum is replaced with a short length of cable with

a plug on its end for plugging into the computer socket, say, and the plug on the wound cable plugs into the network socket. Before plugging the plugs in, the cable is unwound from the drum to get the appropriate length. The trouble is that people move their computers and just pull on the network cable to pull it out of the drum, but this rotates the drum and so twists the short length of cable – which can damage the cable. To avoid this, it is necessary to unplug the short length of cable before winding or unwinding the drum, but this is time consuming and people just can't be bothered. It is also quite an expensive product and so not suitable when installing lots of computers.

My device enables the length of a network cable to be shortened, whilst remaining plugged in at either end, and without putting any twists in the cable. The excess cable is wound within the device.

Once my device has been assembled around the cable, the cable is wound into the device by rotating one of the parts and keeping the other stationary. The thumb holes and ridges help improve grip on the two parts to facilitate this winding. The cable then wraps around itself within the device. Using a flat cable, it is called a ribbon cable, is good because it prevents any tangling occurring within the device since the ribbon cable readily lies on top of itself. Tangling is also avoided by making the internal height of the device the same size as the width the ribbon cable. In any event, any tangles can be spotted through the transparent material of the device if there is trouble winding or unwinding the cable tidy.

The device clicks as it is rotated due to the bumps and depressions running over each other, causing the two parts of the device to flex apart as they are turned. This prevents the cable length from changing without the device parts being deliberately rotated or without a fair degree of tension being applied to the free ends of the cable. A similar effect can be achieved by making the pin fit more tightly into the hole or by putting flat faces onto the pin and hole to inhibit the rotation.

Once the cable has been wound on, the device is ready for use. Many devices can be transported in the same bag or pocket without the cables becoming tangled. When a cable is required to connect a computer to a network socket, the free ends of the cable are pulled apart to create a cable of approximately the appropriate length and the two plugs are placed into the two sockets. Any slack in the cable is then taken up by rotating one of the parts. The taking up of the slack can be performed without needing to unplug the cable and without introducing any twists. The bumps and depressions lock the two parts together to fix the cable at the selected length.

The two parts could fit together in any of a variety of different ways so long as one part has an anchor for the cable and the other wraps the two halves of the cable around it, but it is really easy to use if the parts just snap fit together and you can fit them to an existing cable.

My device is really cheap to manufacture as it only has two plastic parts. But it will be quite expensive to wind the cable on to the cable tidy, so I might just sell the device on its own

I have now left for a last minute holiday in a resort where an IT conference is being held. With luck I will find a manufacturer as soon as I arrive and then I can relax on the beach."

Prepare a full patent specification for filing at the UK Intellectual Property Office which will form the basis for wide, practicable protection for your client's device.

You should assume that the prior art presented by the client is the only relevant prior art, do not rely on any personal knowledge you may have in this field.

Marks will be awarded as follows:

Introduction, review of prior art and statement of invention – 10%

Specific description – 20%

Main claim(s) – 40%

Dependent claim(s) – 25%

Abstract – 5%