

THE JOINT EXAMINATION BOARD

PAPER P3 – Preparation of Specifications for United Kingdom Patents
Thursday 4th November 2010**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 10 pages, including this page, and comprises 3 pages of the question, 3 pages of client's drawings and a further set of the drawings for use in your answer.

In this question you are asked to draft a specification for filing at the UK patent office with a view to obtaining a UK patent. You should assume that the client's description of the prior art is complete. You should not take into account any other prior art which might be known to you. You should also assume that the client's description of the device and its operation is accurate, i.e. that the device works as described. The allocation of marks is given at the end of the question.

Your client sends you the following instructions

Dear Pat

I attach some sketches of my new pipe gripping tool. As you know, these days plumbers tend not to rely on brute force (and ignorance), and the plumbing business itself has become highly technical over the past few years although we can't yet charge quite as much as you do! However, there are still some circumstances where physical strength is required, especially when dealing with old systems.

My gripper addresses the problem of twisting pipes, or stopping them from twisting. For example, some old domestic steel gas pipes have a thread cut on the end and a fitting or connector is screwed directly onto the end. It is easy enough to grip the fitting with a spanner, but holding the pipe to prevent it rotating is more difficult. Also, there are times when you want to twist a copper or plastic pipe to ease the end into a pipe connector, but avoid crushing the pipe while you are holding it.

A large pair of pliers might do the job in some circumstances, but you need a wide hand span to be able to hold the handles when the jaws are fitted around a larger pipe and a strong grip to hold a steel pipe against rotation.

My gripper can be used one-handed and you don't need to squeeze anything to get a tight grip on the pipe. It is also adjustable to fit a wide variety of pipe diameters and can be made of metal or plastics. Plastic jaws are better for dealing with plastic pipes and perhaps also copper ones. I prefer to make the jaws adjustable. I suppose I could sell a range of grippers to suit different pipe sizes, but they would be rather heavy to carry around.

If you look at my sketches, you will see that the outer jaw has an arm which slides in a collar which is attached to the inner jaw. The arm has a screw thread on its upper and lower edges and a circular nut rotates on that. The nut sits in a socket or window in the collar and so the arm moves in and out of the collar as the nut is rotated.

The jaws are roughened to give some initial purchase or grip on the pipe surface. In fact, for heavy duty applications I use teeth on the jaw faces.

The tool has a single handle. The inner jaw is formed on this as one piece. The collar is pivoted on the inner jaw and handle. This is what gives the strong gripping action.

To use the gripper, you adjust the spacing between the jaw faces until they are about the same as the pipe diameter. You press on the inner end of the arm of the outer jaw, to rotate the jaw against the force of the upper spring. This opens out the jaws so you can slide the jaws around

the pipe. Letting go allows the jaws to lightly grip the pipe, with the spring helping this. (Simply pushing the pipe between the jaws against the force of the upper spring achieves the same effect). You can see that the spring is a leaf spring and is attached at one end to the handle and pushes on the collar at its other end.

Pulling down on the handle in the direction of the arrow will cause the inner jaw to roll on the pipe surface. The outer jaw already has some grip on the pipe surface and so it doesn't slide around the pipe, it is pulled towards the inner jaw because the jaws are connected by the pivot above the contact point with the pipe. Thus, pulling down on the handle moves the jaws towards one another and so clamps the pipe between the jaws and gives a very tight grip. (You can see that rotating the handle and inner jaw clockwise around the contact point with the pipe will move the pivot away from the pipe, but the outer jaw is gripping the pipe and so gets pulled onto it).

The other spring is there to urge the collar in the other direction, to help release the grip on the pipe as you release the pressure on the handle.

The long handle lets you achieve a lot of leverage to hold the pipe fast or rotate it with considerable force.

Plastic and copper pipes are quite soft. To stop the pipe being crushed, the inner jaw abuts the arm of the outer jaw at its upper end, to limit the extent to which the jaws come together when you pull down on the handle.

The springs make it easier to have one handed operation. You could feed the tool over the pipe and adjust the nut so that both jaws are just about in contact with the pipe. You can then hold the arm and outer jaw steady and pull on the handle to close the jaws together. Then when you stop pulling on the handle, the gripper will release the pipe.

The jaws are not quite parallel – they form a slight V shape with the outer jaw perpendicular to the arm and the inner jaw sloping. As the grip increases, the two jaw surfaces move closer to parallel to provide a firm and stable grip across the pipe diameter.

I could pivot the outer jaw directly on the inner jaw, but I would lose the adjustability provided by the collar. To pull the jaws together, you need to get the pivot in the right place of course, so that, once you have the initial grip, the jaws squeeze together when you push down on the handle, so the pivot is behind the inner jaw.

This is the busiest time of year for plumbers, so will you please get an application filed today as I will be talking to a manufacturer at lunchtime and will be telling him that I have my patent pending.

Best wishes

Jordan

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

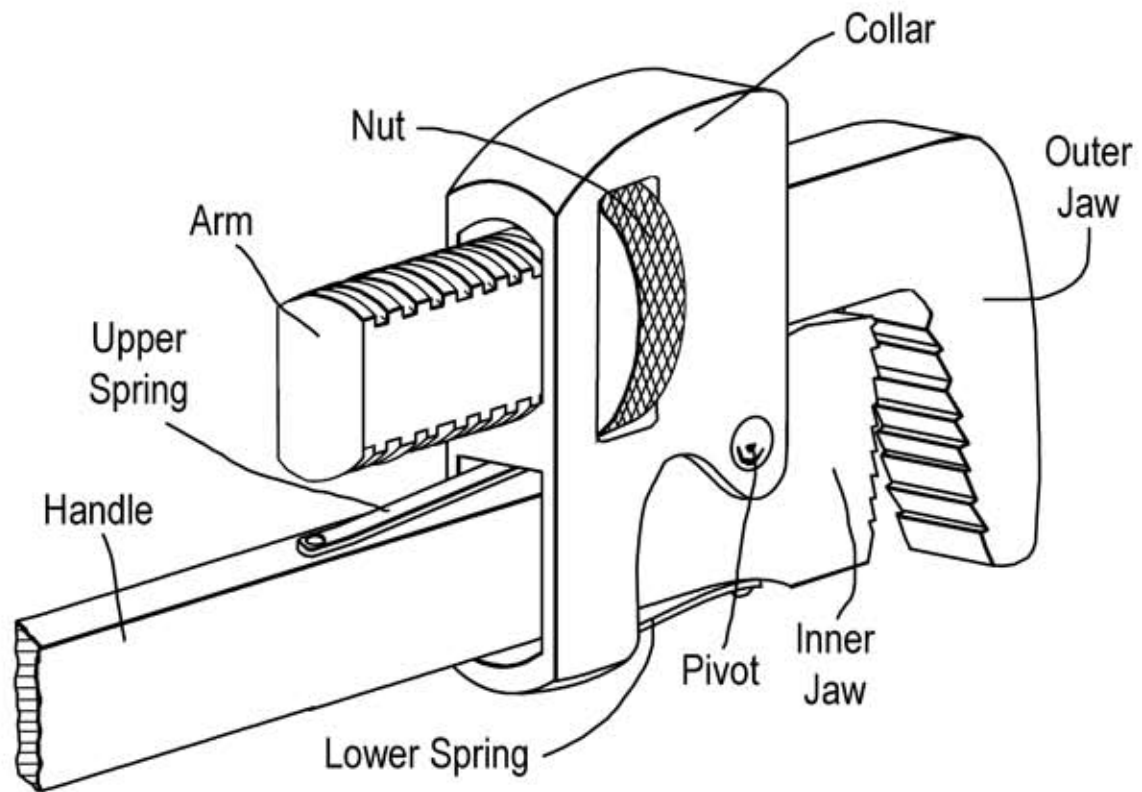
Marks will be allocated as follows:

Claims 60

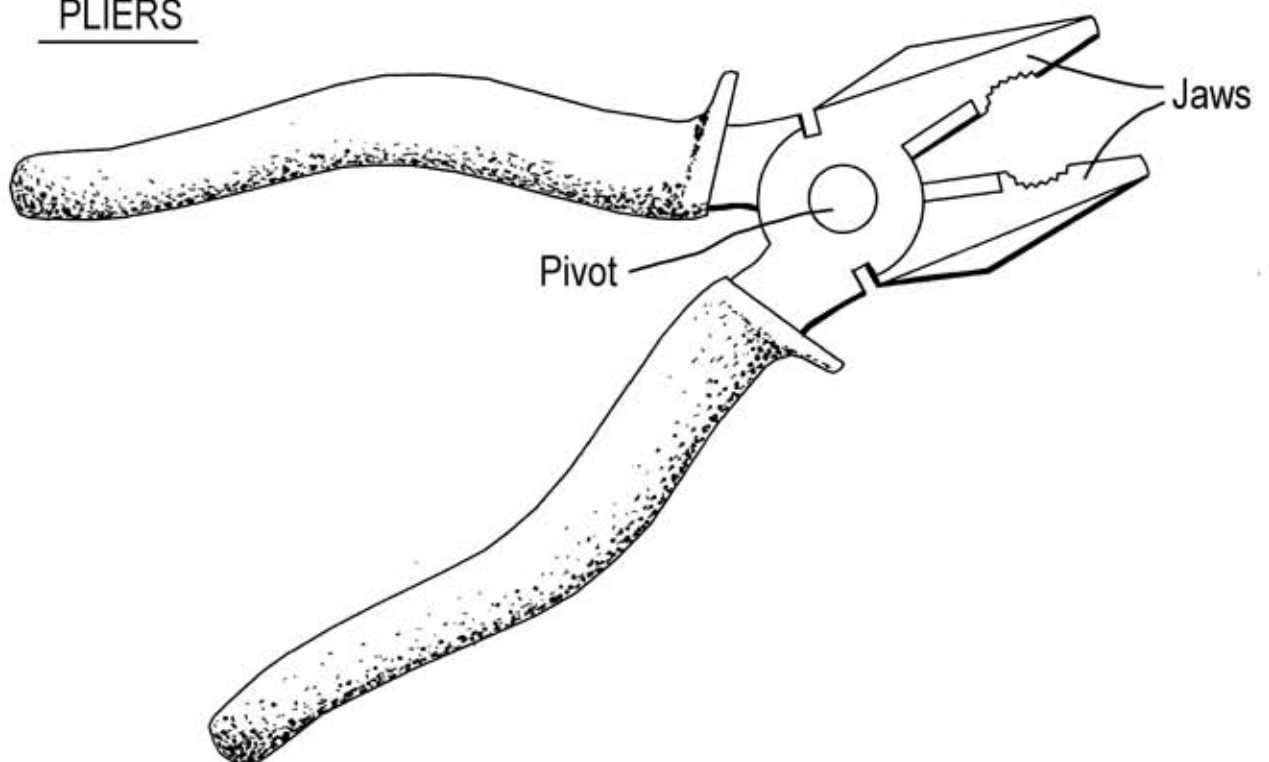
Introduction and Description 35

Abstract 5

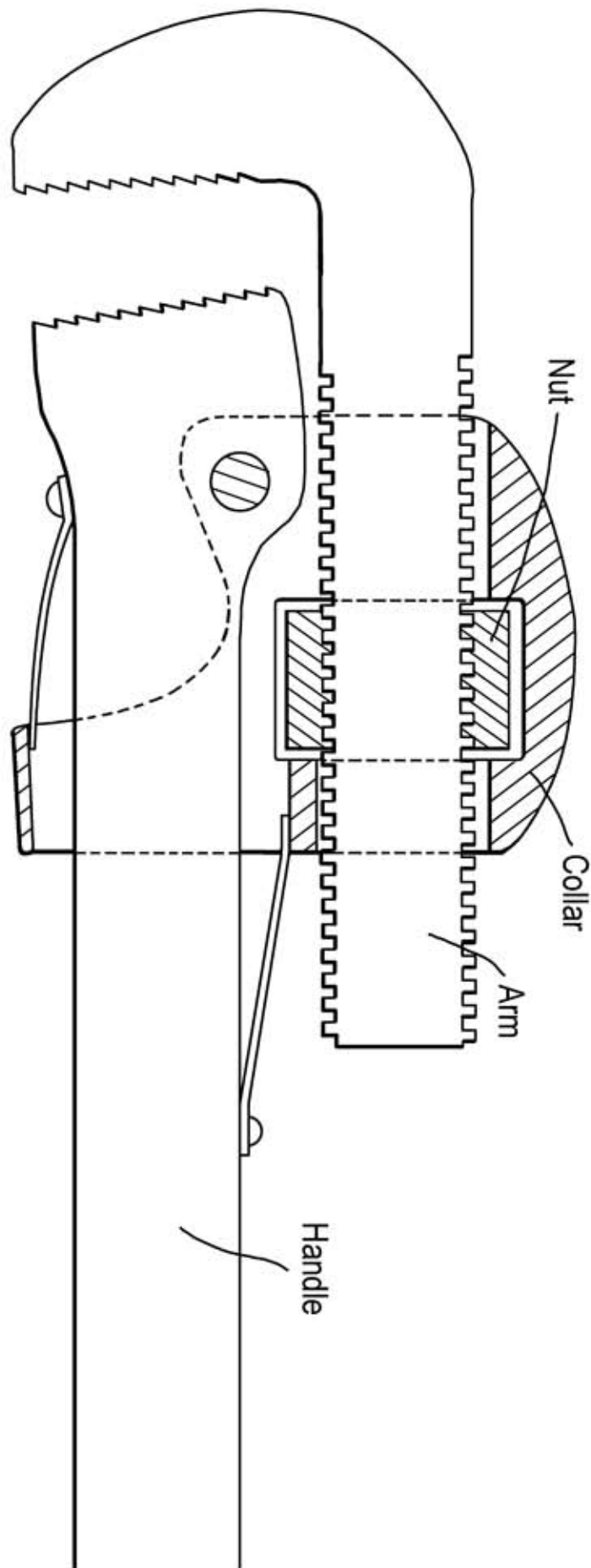
P3 Sheet 1



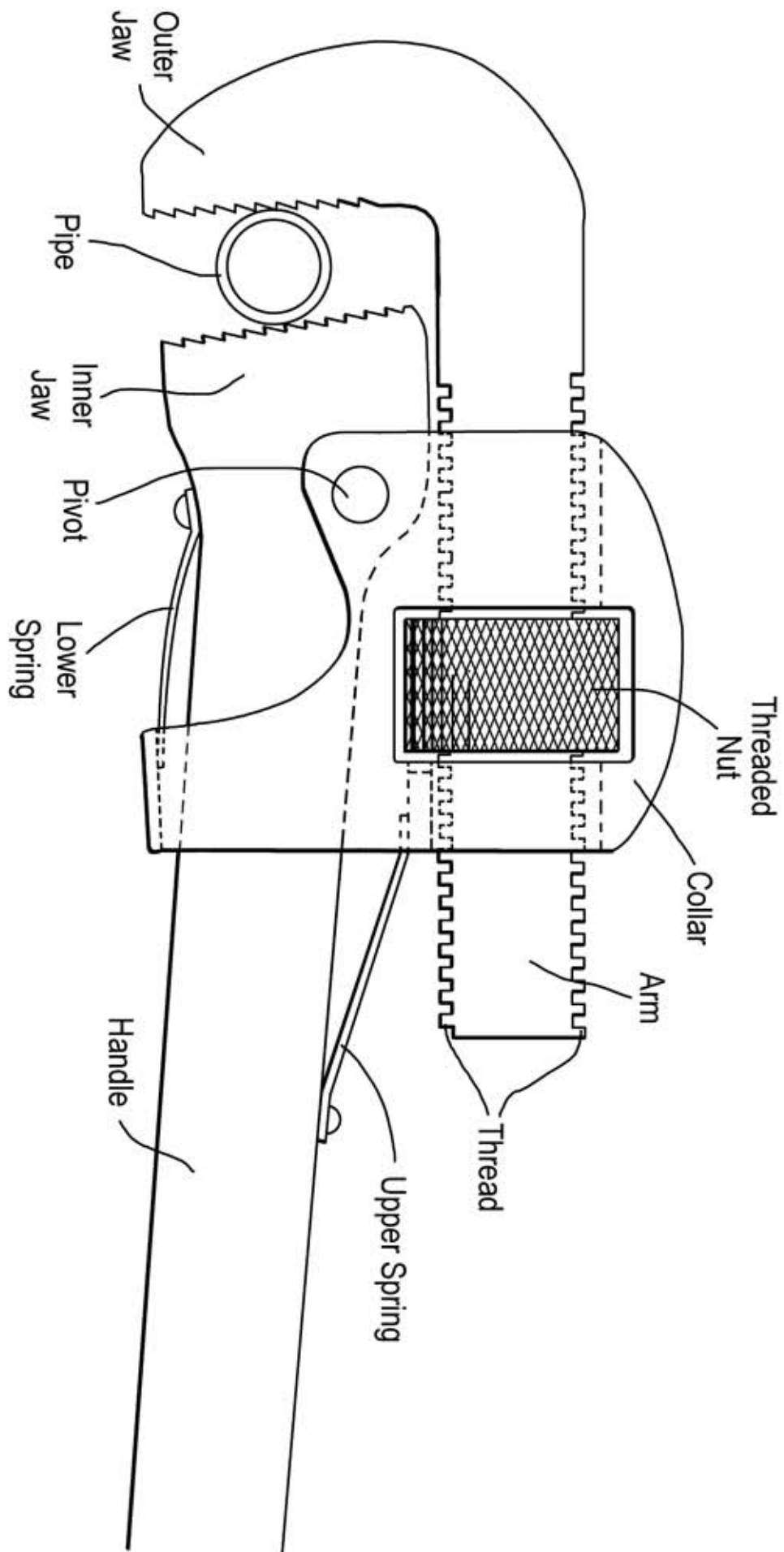
PLIERS



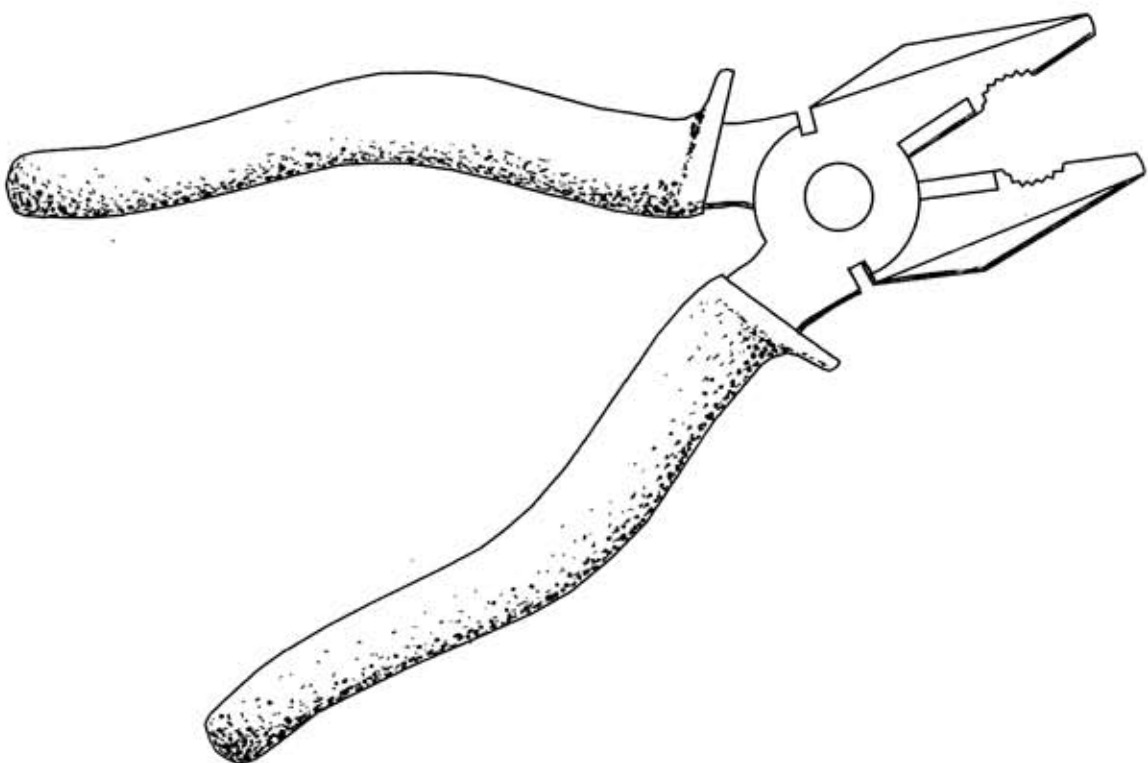
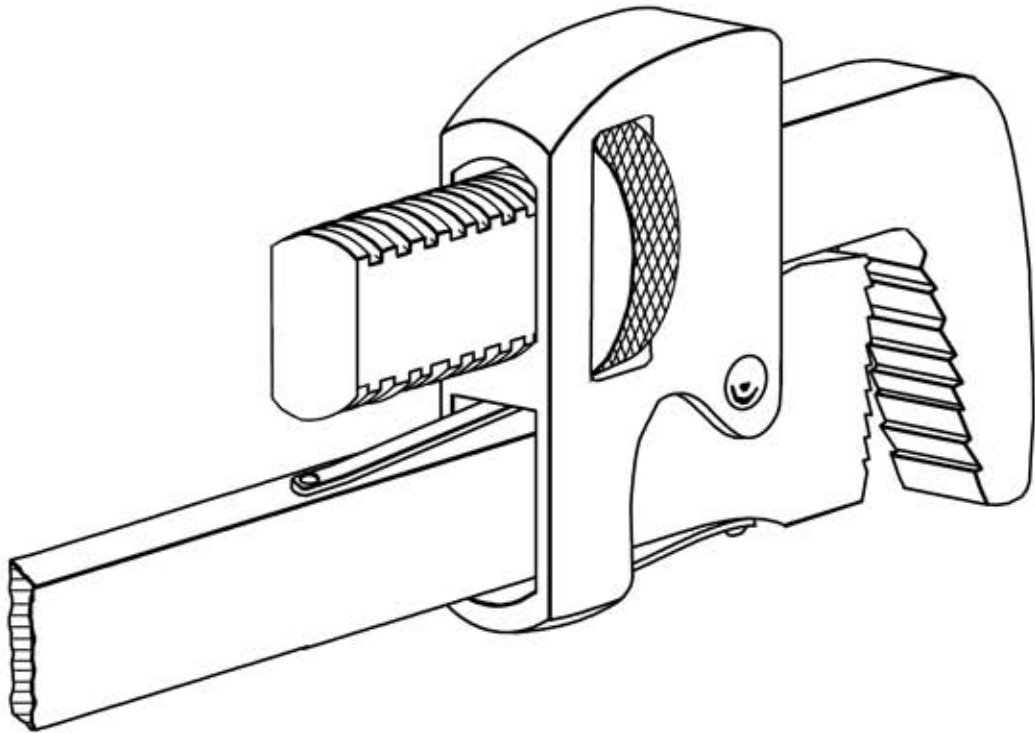
P3 Sheet 2

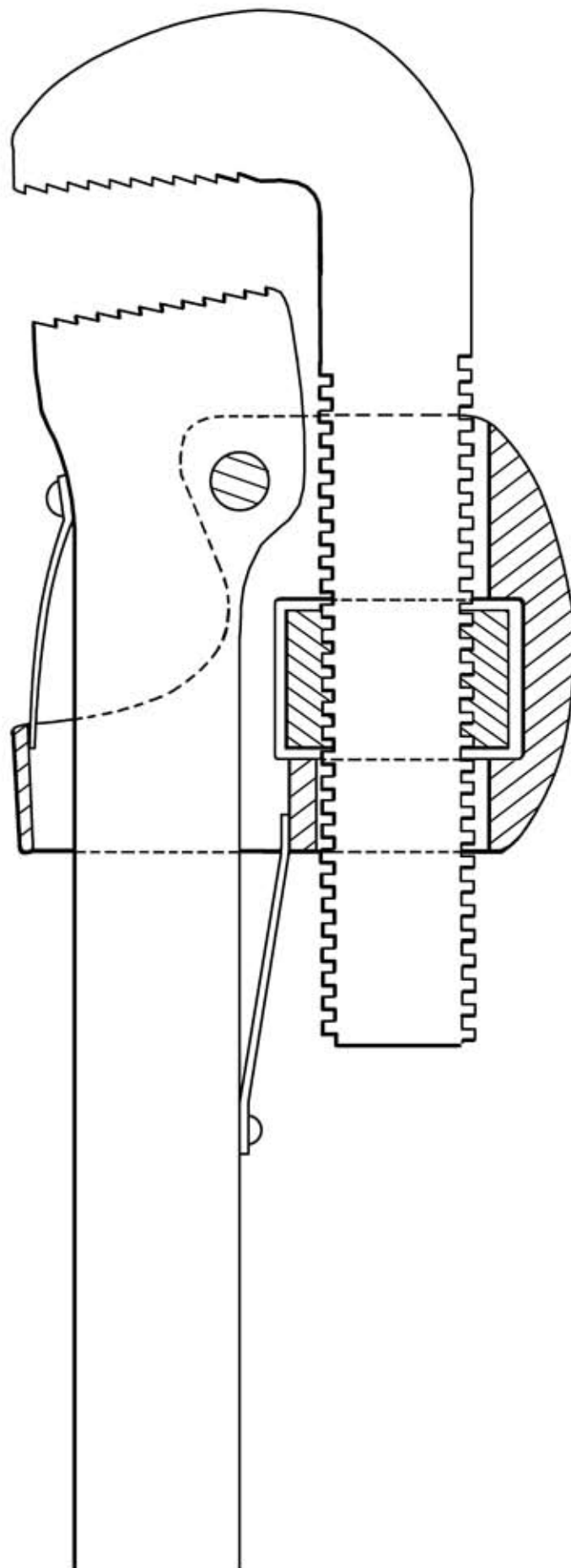


P3 Sheet 3



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