

# The Ladder Shoe Project

In September 1981 Robert Child joined the VIth form at John Willmott School. As his tutor it became obvious to me that he had a great interest in the engineering workshop and especially the machines. I suggested that he become our workshop technician; helping with routine maintenance and stock control for three lessons per week. Robert did this job until Christmas, when a full time technician took over. This left Robert at a loose end.

I suggested that he do some sort of design project. Various ideas were considered, but many were too

complex and most lacked originality. It was after a week of frustration, unable to find anything suitable, that I mentioned one of my pet hates; the base of a standard ladder never seems to fit the ground where it needs to be positioned. Would it be possible to design a fitment to fill the gap? Robert was sceptical but agreed to consider it, and returned a couple of days later with some vague sketches on a scrap of paper. Robert was of the opinion that to be a successful designer you must be a good artist. It was obvious that a more analytical and, hence, logical approach was required. I went through the design process in depth and Robert reluctantly agreed to follow it. He returned with a well written situation and a brief – stating in precise detail the design requirement. After a week of research gaining information about sections of ladder legs (and materials) and possible existing solutions, ideas were forthcoming. Unfortunately many of these initial ideas were either verbal or in the form of blackboard sketches or on scrap paper – but from these the foundation for the later development was produced.

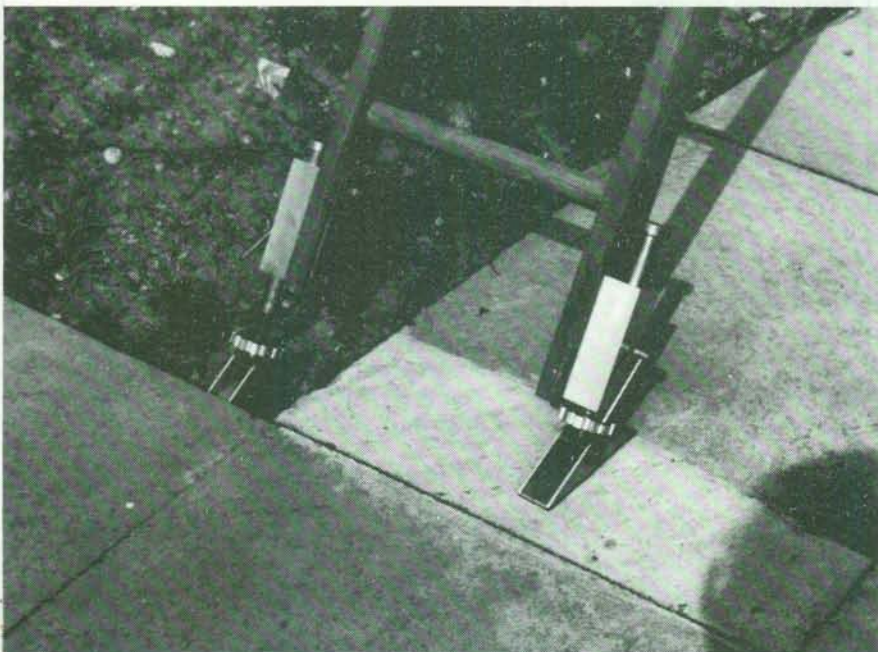
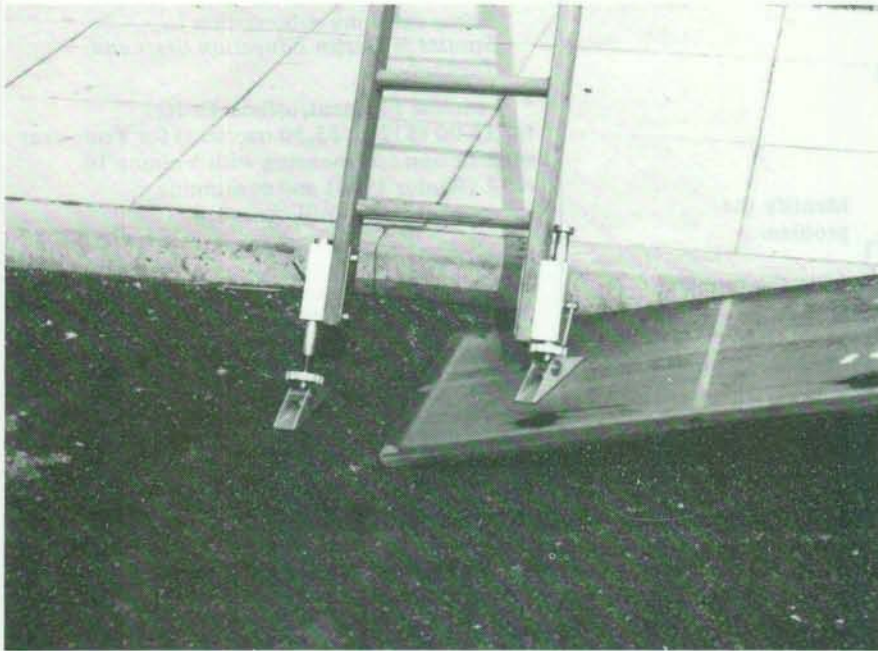
Development then took place in the form of engineering drawing (Robert was very conversant with this form of expression). The first of these, on consideration, proved to be inadequate to the requirements; too expensive, too bulky and lacking a rapid height adjustment. From this Robert produced Design B. This solved the problem of rapid adjustment but it was still too bulky and much too expensive to mass produce. The subsequent prototype was then drawn up; a refinement of the previous design and much lighter in construction.

More work was needed on the drawings, but in order to maintain Robert's enthusiasm and the momentum of the project, I suggested that he should begin production; any minor faults could be ironed out as they arose.

Robert priced the materials required, and it was decided that financial backing was necessary. He took his design work and approached the headmaster. The head agreed to act as backer and production went ahead.

After one or two hiccups, where production control (yours truly) rejected a couple of components not up to satisfactory standard, the project was completed. During production there were times when the project was in danger of folding; Robert became frustrated when progress was slow and he lost sight of the final goal. To his credit, with encouragement, he worked through these difficult stages.

The shoes were fitted to a ladder and the testing by a suitable, if somewhat reluctant, volunteer proved very successful. However, on evaluation, Robert made several suggestions for improvement. Two areas, in particular, require further development. Some form of positive locking is essential in the interests of safety; this could involve a spring loaded pawl or simply holes in the shaft and a suitable locating peg. And, secondly, the design must be adjusted to allow for easier mass production, clip-on, injection moulded plastic, ball and socket feet would be much cheaper and easy to assemble. Different types of foot for



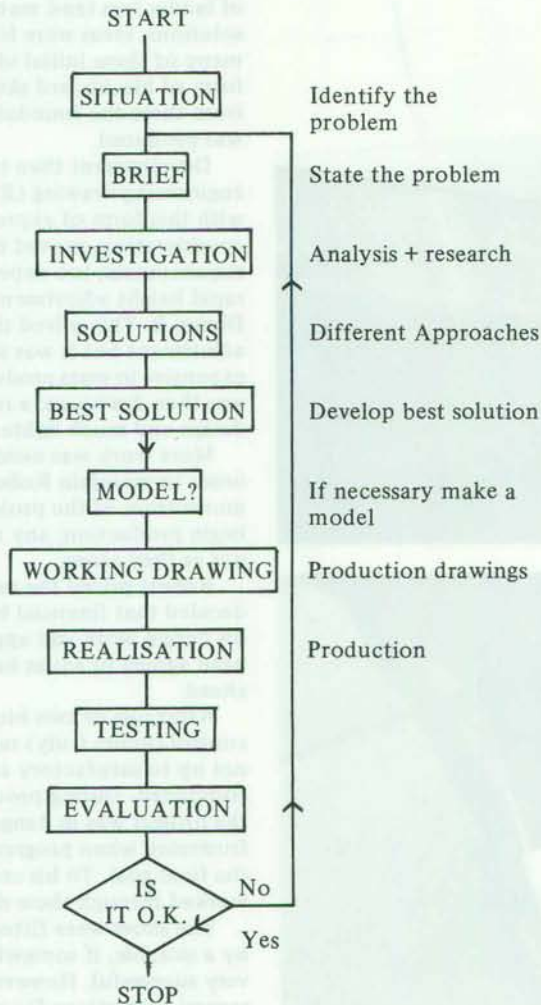


different locations and surfaces could easily be developed.

The time scale of the project was as follows: Design process initiated in November 1981, prototype design complete by second week in January 1982, realisation of prototype completed by Whitsun 1982.

The finished product was entered in the Young Homeware/Hardware Designer of the Year contest 1982 and was awarded first prize as reported in the previous issue of *Studies in Design Education Craft and Technology* (Vol. 15, No. 1).

#### THE DESIGN PROCESS



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