A Design Engineer's Pocket Book

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Preface

Not infrequently an inventor's lot is not a happy one. Having at last captured a much sought-after idea, he seeks to imprison it in technology, only to find it has somehow escaped. The prison has a prisoner, but it is the wrong one. Technology has imprisoned the inventor and tied him up in strings of obscure options, while the original idea dances around outside, still only a will-of-the-wisp of his imagination.

Unfortunately there is no automatic kinship between being good at inventing something and being good at embodying it. The young invent better than the old (with a few remarkable exceptions), but the old have a greater experience of technology, so those who need it most have it least.

To help us there are many most useful engineering handbooks already available; look up anything in their indexes and all sorts of details may be given. But this may help the young inventor very little. He does not know what to look up in the index. A little knowledge may be a dangerous thing, but too much is totally confusing.

Among the many thousands of words in most handbooks, two are generally omitted. The 'best buy' is what he wants to know, but no one tells him which it is. This book is intended to help him find it.

I sent the following letter to over a hundred different engineering suppliers.

Dear Sir,

As you may know, the Cambridge Engineering Department now teaches inventive design to all our students in each year and in addition, we have a special course and degree in Production Engineering.

We should be most grateful if you would co-operate with us in providing 'A Handbook for Inventors', to

help those who are trying to embody their ideas in prototypes but lack the technology to do it properly. To take a random example, there are at least seventeen different design principles in hydraulic pumps, commercially available, each with their own particular assets and liabilities. You know that, and so do I; but a student, fresh from school, may well be ignorant of all of them. We want to help him to discover quickly which design is most likely to be the best buy for his particular circumstances, by providing a purpose-orientated book, indexed according to what things do, not just what they are called. To take another example, imagine a student trying to find a suitable material. He opens some standard handbook and is presented with hypnotising columns of figures in units he has never met, defining characteristics he has never heard about, and concerning things he cannot spell.

We want to give him a book where he can first look up ends, not means, one where the cart is put before the horse. And it is essential, in most instances, to include the relative costs of the different designs. Inflation is constantly bedevilling actual prices but relative prices remain reasonably constant.

It would be most helpful if you could let us have data that would enable us to make a 'best buy' table for those of your products that you think inventors should know about, from off-the-peg structural materials to weight and price-analysed items.

We appreciate that we are putting you to some trouble in asking all this but we hope you will feel the publicity for your designs will make it worthwhile. Would you please mark your replies for my attention?

Yours sincerely

Gordon L. Glegg

The information in this handbook is based on the replies received from these suppliers and on my own experience, both as a consulting engineer and as the

technical director of a large group of companies. I have tried to restrict the options to include those most likely to be 'best buys' in the particular circumstances; I have tried to be simple without being simple-minded.

I think I should add that when setting out to write this booklet I imagined that it would be helpful to give the British Standards number wherever possible. I was wrong. An inventor's overriding priority is to specify those materials that can be found already available, preferably from stock, and stockists only carry limited quantities - limited to the most popular specifications. Call up a stockist and ask if he has any aluminium in stock and he will let you know immediately. If you quote him a British Standards number, he may well have to go away and look it all up, only to say that he has none of that exact specification anyway. I have therefore chosen as representative characteristics of each material those that are most likely to be held in stock when you ask for them by name. When you reach the production stage, exact specifications will be vital and I hope you reach that point soon.