

Squash ball in court

In the first of two parts, **David Baker** considers the optical connections of the small rubber ball used in racket sport squash

The humble squash ball is just 40 millimetres in diameter and weighs 24 grams. It hasn't changed much since a standard version was agreed upon in 1923. Discussions of technological developments in the sport centre mainly on the racket. Yet there are two innovations to the squash ball concerning its visual attributes that have posed interesting issues of patent law. The first, concerning a new ball colour, is the subject of this article. The second, a reflective ball, will be covered in the next article.

Squash was born of a variety of racket games, but popularised by the boys of Harrow School in the mid-19th century. Traditional rackets balls were too bouncy for the confined spaces in which the boys played, but it was found that a punctured rackets ball or balls of softer material 'squashed' more on impact with the walls allowing for more variety and skill of play. Gradually, playing conditions became standardised, although by the early 1920s there were several types of ball in use.

The Royal Automobile Club built three squash courts in 1912 at its premises in Pall Mall and subsequently became prominent in the development of the sport. One RAC member, Col RE Crompton, carried out extensive research and testing on a variety of balls then available, as a result of which the club adopted their preferred ball. A meeting of delegates of squash-playing rackets clubs in 1923 agreed that the RAC ball should become the standard for the sport.

Traditionally squash balls have been made from rubber mixed with synthetic additives to give them the required qualities of strength, resilience, colour and curability (the



The ball squashes on impact with the walls, allowing more skill of play

ability to be cured, or vulcanised).

Two half shells are moulded which are then glued together and buffed to give the characteristic matt black finish. Not much changed until the 1970s, apart from some experimentation with a synthetic alternative to rubber, that was unsuccessful due to the tendency of these balls to split.

Non-marking development

There was one longstanding disadvantage with the black rubber ball, however: it marked the white squash court walls. A non-marking dark green ball was developed with some success but, in 1975, a patent application was filed for a new blue squash ball which, it was claimed, gave a surprisingly beneficial visual advantage to players. At issue was whether this 'discovery' amounted to an 'invention' ('manner of new manufacture') as required by the Patents Act 1949 (which was then in force). This involved considering whether the new colour provided an unexpected or non-obvious technical benefit over the 'prior art'; and whether this identified a problem with the prior art even though the solution, once found, seemed obvious. Essentially, was the new colour of an incidental, ie cosmetic, rather than technical nature?

The judge hearing the case in the Patent Office pointed out that many sports balls are coloured to enhance visual contrast, so the applicants couldn't generally claim an invention by colouring a limited class of ball; neither the mode of manufacture nor the advantage sought was new. But the applicants were seeking to establish that their ball had an unexpected, unusual or non-obvious merit. This, said the judge, was tantamount to claiming that a blue/white combination was not one that would naturally be considered for contrast purposes; on the contrary, many traffic signs, for instance, used just that combination.

Evidence for the visual advantage produced by the blue ball was offered in the form of testimony from a noted squash player who had been asked to try it out. But the judge noted that such testimony was particular and could not necessarily hold for all players, neither could it be extrapolated for all playing conditions. The judge's opinion was that the applicants had not established a uniform advantage over existing squash balls; they offered only an alternative. As such, there was an inherent lack of novelty: the claims related to a known squash ball given a particular colour for 'eye appeal', so the application was denied.

The applicants appealed to the Patents Court in July 1978. The judge

there was impressed by new evidence supplied by the inventor. Having experimented with many colours, he had settled on a colour denoted as 'Flander's Blue', a sort of royal blue, defined as shown in the *British Colour Council (BCC) Dictionary of Colour for Internal Decoration*. The Dictionary is the BCC's standard colour range for paints, comprising around 60 colours, arranged in a logical order using Munsell notation.

The *Munsell Book of Color* defines colours by assigning them values of three attributes: Hue (colour), Value (lightness factor) and Chroma (intensity). As well as the above-mentioned squash player's testimony '...much to my surprise and pleasure ...the ITS blue ball enhanced the acuity of my vision of the fast moving ball' – the inventor produced questionnaires completed by other squash players that corroborated the effect of surprisingly good visual perception of the blue ball.

Further evidence was presented of the commercial success of the new ball: sales of over a quarter of a million in 15 months; other manufacturers marketing their own versions; and advertisements and press releases in

sports magazines. The judge pondered as to why, since sufficient novelty in the product was the issue, earlier experimenters with non-marking balls had not happened upon this blue colour? The above evidence would indeed suggest that there was a distinct advantage to the blue colouration, negating the argument that the blue ball was merely 'a known ball of particular colour chosen for eye appeal.' Hence the application did relate to an invention (a 'manner of new manufacture'), and the appeal was allowed.

The result of the appeal was a surprise to some patent law experts, as it seemed to be a weakening of the principle that mere discoveries and cosmetic changes to an existing idea are not patentable. As *New Scientist* of 29 March 1979 reported in its technology pages, 'Although BP 1 538 860 was granted under the old patent law, the case must surely influence future attitudes to what is permitted within the new laws.' Even though patent law has evolved since then, this case is significant in that it is still often quoted to illustrate the general principles of technical versus cosmetic developments.

The general idea can be summarised as follows. A dark green ball is developed: is it patentable? Were the only difference from the black ball cosmetic – no. But as it solves the technical problem of marking the walls, the answer is yes. A blue ball is then developed: is it patentable? The technical problem of marking has been solved so, again, if the only difference is cosmetic – no. But it solves an 'unexpected' technical problem of visibility, so (as was argued in the appeal) the answer is yes.

The visual attributes of the blue ball have in part been obviated by newer technologies (as discussed in the next article). The only blue ball currently in production is the Dunlop Max, a ball 14 per cent larger than standard, designed for the complete beginner. But optical professionals are entitled to ask: why was there no consultation of vision specialists in the patent case? As the original judge remarked, '...chance findings [of enhanced visibility]...may not be so surprising at all if the problem to be solved is put on a proper research basis...'. ●

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