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From The PowerGlide Lab

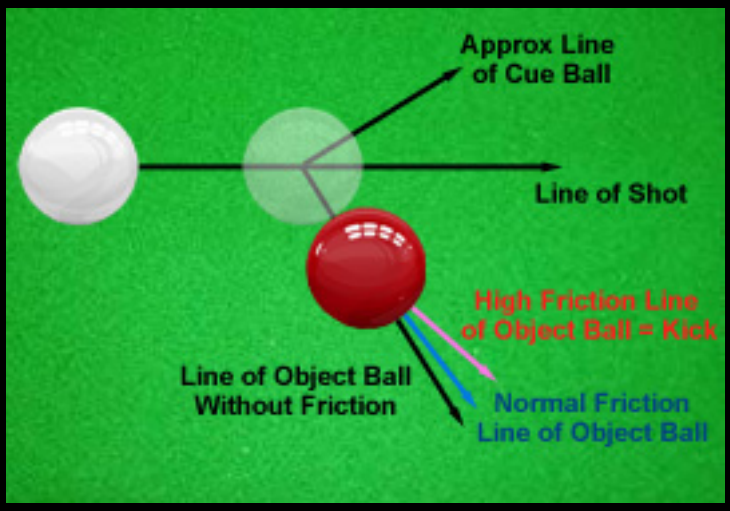
Mr Bumble Kicks Off

In the first two blogs from the PowerGlide Lab Mr Bumble, our intrepid apian hero, kicked off by stopping an express train, thus helping to explain how cues behave. This time he faces an even sterner challenge, to de-mystify that persistent mystery of cue sports, the phenomenon of kicks.

It's pretty obvious that imperfections in cue or object ball or table surface could give rise to a kick, a shot behaving unexpectedly for no obvious reason, the balls either jumping off the cloth on impact or taking an unusual path. Such an imperfection may indeed sometimes be the culprit, especially with less well-maintained equipment, but kicks also occur in top-quality professional playing conditions and it is generally accepted that other factors must be at work, the two principal suspects being the build-up of chalk deposits or static electricity on the balls.

In the past some very detailed studies were undertaken to ascertain which of these is the principal mechanism behind a kick, but to some extent the jury remains out, recent innovations aimed at reducing or even eliminating kicks still providing slightly conflicting evidence.

In professional snooker the use of anti-kick cloths containing conducting fibres to prevent static build-up on the balls has reportedly considerably reduced the occurrence of kicks, as has the introduction of more exotic chalk formulations aimed at limiting transference of chalk from cue tip to cue ball. This may perhaps indicate that a combination of the two factors is involved, possibly a static charge on the ball promoting the adherence of chalk particles.



Whether one or both of these factors is at work, in dynamic terms the mechanism of a kick is not hard to explain, and neither is the cause; it's simply increased friction. The diagram on the left shows the paths of a cue ball and object ball during a stun shot (where the cue ball skids rather than rolls over the table). Normal friction between the two balls will drag the object ball slightly off the "line of centres" path, some excess friction and there's a kick.

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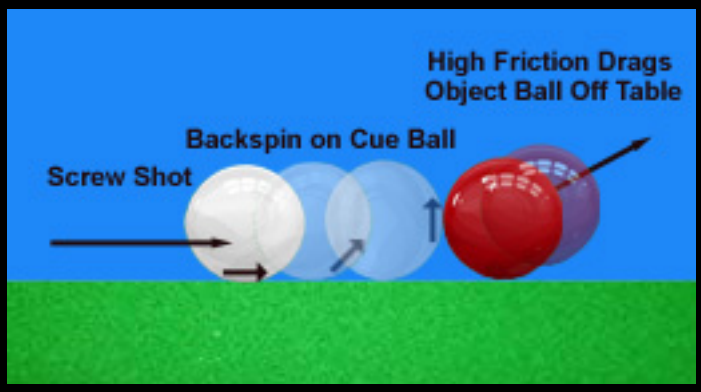
Although novice players may use the "line of centres" as a working guide to where the object ball will go, with practice an allowance for the friction effect, which will vary depending on the speed of shot and any spin imparted to the cue ball, will become second nature. Any unusual increase in that effect, whether due to a dab of high-friction chalk dust on the impacting surfaces of the balls, or even an electrostatic attraction between them, will thus cause the object ball to deviate from its expected line, potentially resulting in a frustratingly missed pot.

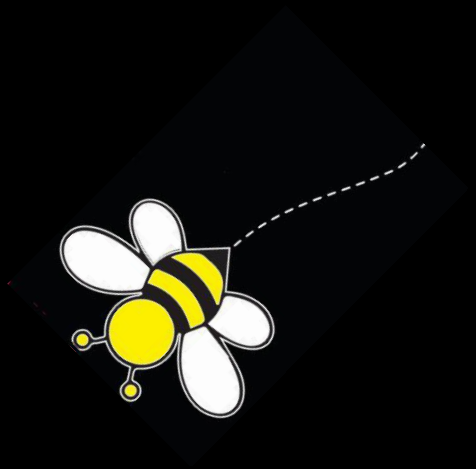
With topspin or screw shots unusually high levels of friction could also cause either cue or object ball, or even both, to leave the cloth on impact – another characteristic of a kick. A mechanism for this with a screw shot is shown on the right. By analogy it can be seen that, with a topspin shot, the cue ball may jump up, which may potentially cause the object ball to do likewise.



So that hopefully de-mystifies kicks, but can that understanding be employed to reduce their occurrence? Well, the very purpose of chalk in cue sports is to increase friction, so it seems reasonable that chalk dust adherence to the ball is indeed a major cause of kicks. Chalk formulations that reduce this are thus an obvious way forward, although there may be a trade-off with miscues if such a formulation also results in reduced adherence to the cue tip.

The apparent success of anti-static cloth in the professional game may also indicate other anti-static measures are worth considering, if only to reduce chalk dust adherence to the balls. Cleaning them with anti-static cloths or wearing anti-static shoes and clothing might not make a big difference, but it would certainly be much cheaper than resurfacing all the local club tables!

And that's all from The PowerGlide Lab for now – time Mr Bumble was kicked off the page!



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