LESS LEES

Patrick: My father once told me that Jeremiah Colman was asked to sum up how he made a fortune from such a humble thing as mustard. His reply was that he became rich because of the mustard that people left on the sides of their plate. I was seven at the time, so the point was entirely lost on me -but it might also have applied to the mustard they couldn't extract from the jar.

Anyway, I was recently reminded of this cautionary tale when reading about a new technique for coating containers with a specially low-friction material (http://www.scenta.co.uk/Engineering/1704070/hi-tech-non-stick-nano-packing.htm <http://www.scenta.co.uk/Engineering/1704070/hi-tech-non-stick-nano-packing.htm>). This apparently has the effect of reducing the residues by about half. It's a pretty elaborate process, though, involving igniting gas plasmas in a vacuum chamber, whilst applying a voltage to the containers themselves.

So I began thinking that there surely must be a simpler, if less glamorous, way to achieve a similar reduction in container residue. I mean isn't the safety of all this nanotechnology stuff supposed to be still in question? I'm really not keen on the idea of putting tomato sauce on my chips together with a light dusting of asbestos-like grit. Even Teflon, scraped off a frying pan, is now regarded as even more dangerous than the fried breakfast it's cooking.

One idea I had (http://iotd.patrickandrews.com/2007/01/16/less-lees/ <http://iotd.patrickandrews.com/2007/01/16/less-lees/>) was to do with putting a magnetic bean inside the container of viscous fluid and driving it from outside -both to keep the material mixed and also to scour the remnants from the walls (Figure a). You're the expert in packaging, what do you reckon? It's so like the magnetic stirrers I used to use in chemistry lessons that the idea is probably patented -or proven useless.

Inevitably I came up with another approach. Think stripy toothpaste. Ok, I know that toothpaste is an example of the problem of in-container waste, but what I mean is that the red stripes and white material are kept separate, only mixing on exit. Why can't we do something similar with many viscous liquid mixtures? If they contain several components, we could somehow store the least viscous (e.g. vinegar) in contact with the container wall, only mixing them all together as they leave.

Mark: Yes, I read about this new technique myself, but have some issues with it. Although I like solutions where no additional human intervention is required, as it drains more efficiently, the processes to achieve it may well outweigh all the benefits. I also disagreed with the figures bantered about that as much as 20% of material is left in some packs. Testing shows it is more likely to be 5% to 8% in glass bottles, 7% to 10% in plastic tubes and 1% to 3% in plastic (upside down) containers.

Do not get too concerned by the 'nano-packaging' by-line and your chips just yet. The coating of a thin (less than 20 nanometres) film on packaging containers has been successfully used for many years, adding good barrier properties. It just happens to be thin enough to give it the nano label. A light dusting of asbestos-like grit would, of course, be extra!

First, I feel we should focus our attention on one of the main offenders - glass bottles (we can tackle tubes another day) - and then ask ourselves a question "Do end-users want us to change the pack dynamics?" Yes, there is growing consumer pressure to resolve this waste problem but, I am sure, subconsciously anyway, a large number of the great unwashed enjoy the ritual (and have a wrist bandage to prove it!) of shaking and hitting the bottom of the bottle in the battle

to get that last bit out. (Just look how TV commercials always portray this action in an effort to help sell their product). Actually, the 'non-stick' nano-packaging idea would not change the pack/consumer interaction or their perception of waste, as it would not look much different than it did before, even if their prediction of halving the waste is true, because the sauce clings to the side walls giving the impression that there is more left than in reality. For these reasons, and that the hi-tech process may cancel out any environmental advantages, it is not an ideal solution for me.

Patrick: There's a part of me that says that some people actually like a challenge...but not when they are hungry, I guess. As for asking end-users, I have some sympathy with Henry Ford:
"If I'd asked people what they wanted, they'd have said faster horses."

Mark: Your ideas of putting a magnetic bean in the container sounds far too 'fiddly' and unhygienic for the dinner table and the 'think stripy toothpaste' approach would not work in practise. These packs do not mix at exit as such, they only apply thin coloured stripes, via an internal piping system, to the main body of dispensed white paste or, in more modern striped toothpaste packs, the tube is filled with the ingredients pre-mixed in striped format. To separately store the varying viscous liquid mixtures, as you described, is not feasible. It would require some form of internal partitioning, adding to the pack cost and creating more surfaces for the material to adhere to.

The difficulty here is that, like cork screws, for example, there are many possible solutions, but probably only a handful that work well. To help my thought process, I conducted a small survey, called 'sauce busters' (in memory of the great Barnes Wallis, of dam busters fame) to see how people generally get that last bit out. Results as follows:

Leave upside down, add milk to salad cream and mayonnaise and shake. Add vinegar to tomato ketchup, brown sauce and mustard and shake, use a knife, run bottle under a hot tap, put in the microwave for 30 seconds (do remember though first to take the metal lid and any remaining foil off), add ball bearings to break up the material by shaking, use centrifugal force by playing 'spin the bottle'. Be careful on this one as it could get you in trouble in many other ways and finally the "I don't bother mate, just buy a new one!" brigade.

Patrick: Well I'm beginning to think I'd rather be a little wasteful than risk swallowing some ball bearings or lacerating myself on shards of spinning bottles. It's worth remembering, though, how gratifying -even entertaining- people find products which include some 'animated' aspect. Think of spin dryers and cyclone vacuum cleaners.

Mark: A possible solution!

A small battery powered vibrating stand (bit thicker than a place mat), which only vibrates when you put weight on to it (no on/off switch needed) that can safely hold a bottle (minus its cap) upside down with a removable catchment/serving bowl (volume capacity of 10% of a standard glass bottle)(Figure b). Maybe disguised as a condiment set, making it not look out of place on the dinner table and multifunctional. Yes, I know it is a bit gimmicky (if not tacky), but small and cheap sells, especially if you can catch the general publics' attention about saving money and waste. This could make a good TV selling channel product.

If all else fails and you really want to completely remove the residual from a glass bottle, without using hi-tech and/or energy dependent solutions, then some form of human cognisant intervention is required.

It may not be cutting edge, but what is wrong with using a long plastic/metal bespoke spoon where the spoon edges follow the inner contours of your standard sauce bottle, with a small built in scoop? Brand owners could attach it to their bottles as a free gift and incentive to buy. We could call it the 'Saucy Scoop' or is this too near to a 'Pooper Scooper'?

Patrick: I like this approach. Maybe the 'spoon' could take the form of a flexible loop pushed through the neck of the container until in contact with the interior surfaces -something like a 3-D windscreen wiper (Figure c). Rotate this, with the container inverted over a dish, and the residue emerges ...It would be possible to make this adaptable to a wide range of internal geometries.

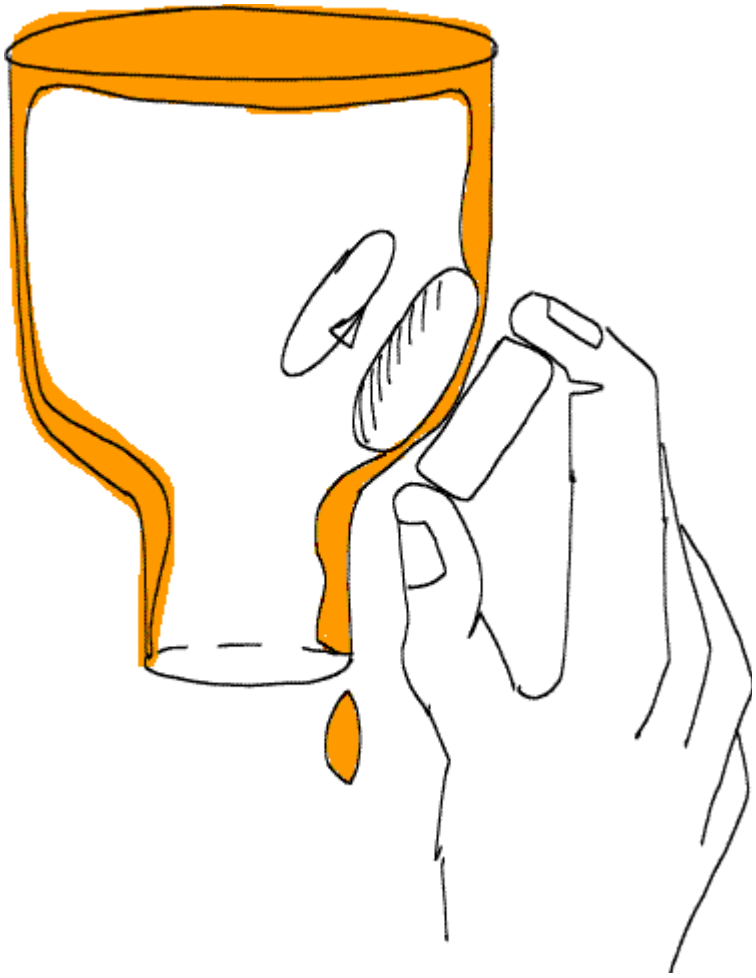
Failing all of this, can't we think of a clever way to make this packaging invertible (i.e. to pull a container inside-out for access to any remaining product -Figure d)?

Mark: Actually, the invertible packaging (figure c) system incorporated into the flexible rotating loop in figure d, could work, but to improve the sauce fluid dynamics (and not have to worry about gravity), an 'Archimedes Screw' type thread can be added to the outer loop surface. When in place and rotated it will help push the sauce upwards.

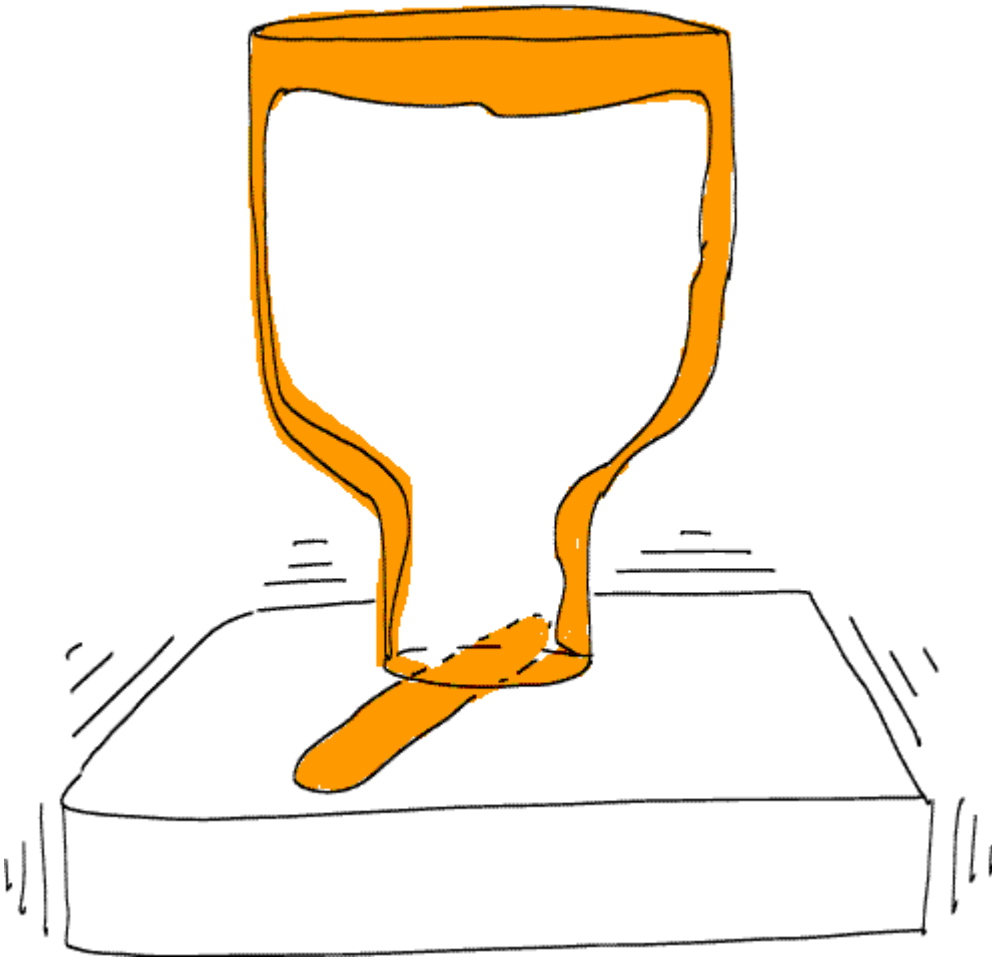
In the light of day, it seems to me that I have lost the plot a little and gone a bit loopy myself. The loop is far too elaborate, incorporating an 'Archimedes Screw', automatically expanding to the inner core (I must remember to try and keep things simple).

Patrick: You are quite right when you frequently drag me back to reality by saying there are lots of ways to invent a solution to some problem, but it's important to find the right one: the one that achieves the best possible result in the most elegant way. I think this is an example of an opportunity that needs more thought. Let's let it mull and return to it later. Maybe we will stumble across an answer that's already out there, in some other application...like glassmaking -or gardening.

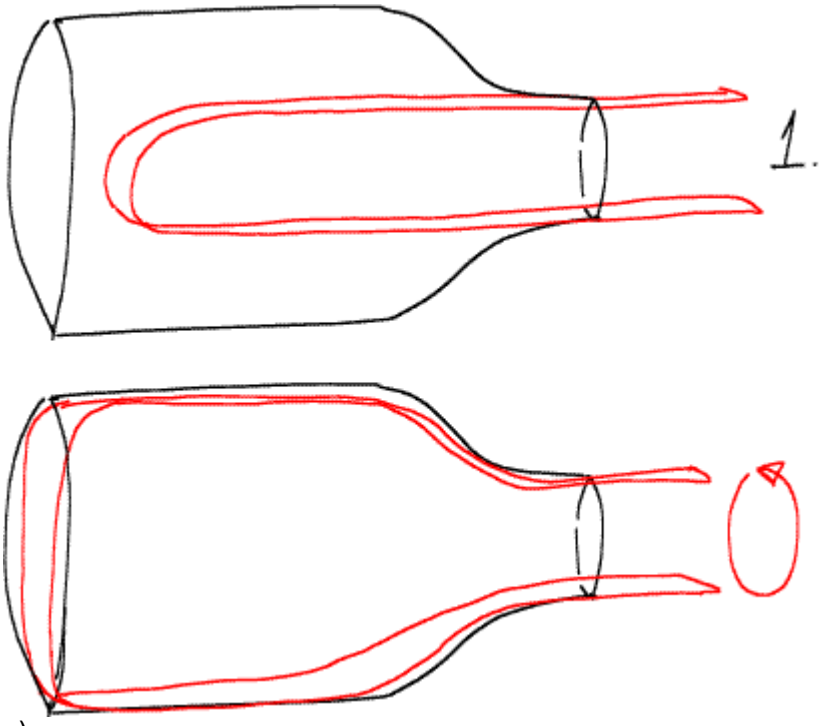
A search carried out by the British Library Research Service (www.bl.uk/research <http://www.bl.uk/research>) on 'Scooping the last residues from jars' etc revealed nothing.



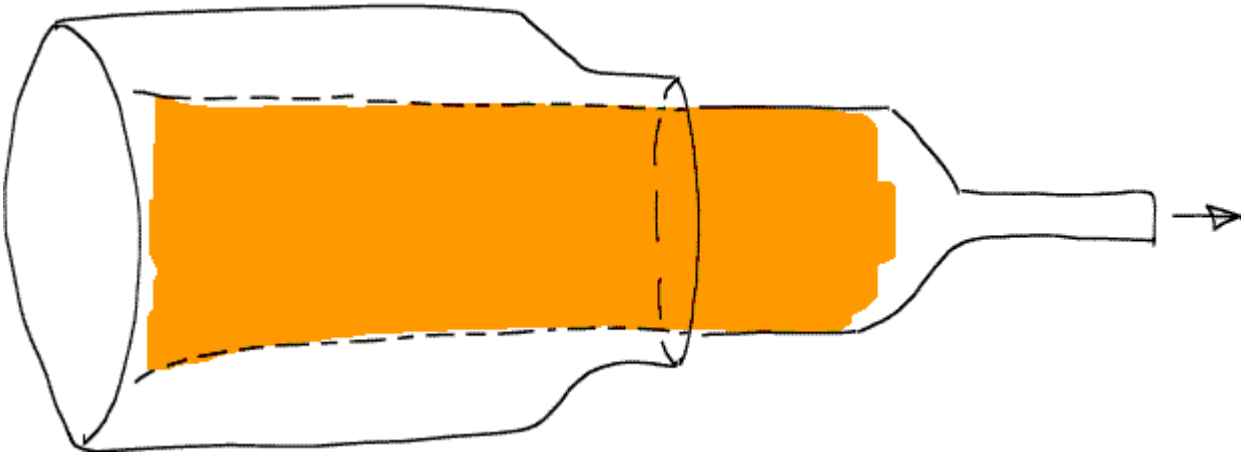
a)



b)



c)



d)