

## Inventors' inbox: Snowed Under with ideas

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Our in-house inventors Mark Sheahan and Patrick Andrews exchange emails on how to avoid the repetition of last winter's technology freeze-up in the UK.

Patrick: A friend of mine was recently on a business trip to some outpost of northern Norway. Despite an overnight snowfall of 60cm, his journey was completed on-schedule. In the UK, we too have winter once a year and yet our approach to dealing with such 'extreme conditions' doesn't seem to be improving. In fact, there's a rumour that the economy and weather are correlated. The last major 'snow event' in the UK was during the pronounced economic chill of 1991.

Mark: That's the problem, we are not Norway. Our climate is much milder and unpredictable. It does not make practical sense to put major infrastructures and contingency plans into place, for an occurrence that is now as rare as hen's teeth. I hope that the rumour is right, as I would not want to go through a depression too often.

Patrick: Milder? Anybody venturing north of Watford might take issue with that. Apparently, during snowy periods, 20 per cent of our workforce obey the police request to 'stay at home'. Surely we can do better than resign ourselves to 'circumstances beyond our control'. Children in Yakutsk in Russia go to school until it's below -55°C. Perhaps we in the UK are running short of several forms of grit

Mark: I love the snow, not just for its beauty and for defining a season, but for the 'more friendly' effect it has on us - putting a smile on your face. Neighbours and strangers alike, who normally ignore each other, speak. It may only be about 'the weather', but it's a start.

Snowball fights, snowman construction, and tobogganing equates to great vivid childhood memories for me. We need them, and so do our children. The more I think about this, the less I want to solve snow mobility problems. A couple of justified buckshee days off work (even if unpaid) can do you the world of good. More people in future should obey the request to stay at home.

Patrick: Perhaps we should just declare a public holiday when anything unusual happens meteorologically? I'd rather try addressing the problems of snowfall inventively. The biggest issues are:

Transport: road and rail communications skid to a halt with emergency services and schools being particularly affected (the school run becomes impossible).

Domestic heating: our bills go through the roof.

I thought we might have a bash at some inventions within each of these areas.

It costs local authorities huge amounts of cash to spread grit and salt on roads. (Huntingdon-shire District Council claimed a speedbump outside my house cost £15,000, so nothing surprises me anymore.) This gritting also does untold damage to vehicles by corrosion, so I propose that sections of roadway being snowed upon could be quickly driven along by a lorry unrolling a lane-wide sheet of chicken wire mesh. This material is pretty resistant, reusable and almost as cheap as the dirt alternative. This would provide cars with some extra grip, and the vibration caused by passing vehicles would potentially liquidise the snow crystals falling on it at a rate which could be high enough to cope with most normal UK snowstorms.

Mark: Chicken wire mesh! What will we use to keep the chickens penned in? Lined up snow shovels? This does not work on so many fronts. Where do I start? Logistics maybe.

Too many lorries would be required. Although there may be a 'credit crunch' induced imported surplus parked in a field somewhere. If so, why not just attach snow ploughs on them and be done with it?

Physical constraint - even with massive rolls of chicken wire they would not unroll very far, going back and forth to the wire depot, adding to the congestion.

Safety - if the wire got snagged and pulled along by a vehicle, it would cause all manner of problems.

The extra grip comment is a 'give me' - as putting wire mesh/chains over wheels (although not the road) does help; but, for liquidising the snow through vibration, no way. If anything, as the snow is compressed into ice by traffic, it would be fortified by the wire, taking much longer to break up.

Patrick: So let's hang around and wait for global warming? Actually, it might make sense to have the wire located only at those

sections of roadway known to have ice-related problems (these could be hinged on one side and rotated into contact with the road when the first flurries appear); or perhaps we could design a tracked 'tray' into which people could drive their cars - a bit like a lightweight skip - with buffers on the inside to protect paintwork. The narrow tracks on each side would be driven by the car's wheels (via, for example, rollers), and movements of the car's steering would be interpreted as signals to connect the left or right rollers to the tray's track on that side. If a collision did occur, during a slide the extra layer of protection would be welcome.

Mark: Rollers and snow do not work well together and your extra layer of protection from the 'tray' would damage the car in a collision. Wrapping the car up in cotton wool (as health and safety would have us do) may be a better alternative, although it will disappear in thick snow.

Patrick: Actually, having a fat wall of ploughed snow between colliding objects might be a good idea. Failing all this, somehow turning the top surface of a road-covering snowdrift black would cause it to melt during daylight more rapidly. It might be possible to vacuum up the quantities of rubber grains, which are routinely shed by tyres, from the roadside and spray them on the icy blanket.

Mark: Sorry, I like my snow white (not to be taken in the wrong context), and I can just see the advert for the job of vacuuming: 'Experienced cleaners wanted, to Hoover the M25, only people with a death-wish should apply'.

Patrick: Certainly it's safer just to stay indoors - but hardly the spirit of Scott and Shackleton - they would have got to work, even if they had to eat their huskies. If we could make the snow fall only where we wanted it, of course, then most problems could be avoided. The Chinese currently operate a cloud-seeding programme, but it's probably not precise enough to automatically build a ski slope next to a clear road.

Mark: I am not a keen advocate of tampering with nature, as it is a very powerful force and has a way of kicking back. Although, it would be great to make it snow at Christmas every year.

Patrick: What about domestic heating? People have been living in snow houses for a long time. Maybe one solution is to design a small domestic snow blower to pump the drifts onto the roof of one's house. The thermal conductivity of ice crystals is reasonably low, and the surface is quite reflective, so this could seriously cut heating bills in a wintry spell (assuming your roof is sufficiently supportive). If we have robot vacuum cleaners and lawnmowers, why not show shovellers?

Mark: Have you not heard of lagging your loft? Also, snow settling on a roof can be a natural occurrence, depending on the roofs design, so there would be no need for blowers.

I believe keeping warm and saving on heating bills is much more important than solving the snow mobility problems, which can be sorted out by throwing money at it, but we have none.

Many households, in the cold spell and with soaring heating bills cope by heating just one room (their living room), until bedtime. Rather than lose all this build-up of heat, I want to redirect it quickly into an upstairs bedroom, through one easy manual operation.

Design an extractor fan with a built-in heavy metal centre with a centralised sharp pin end protruding on one side. The pin-sided fan is placed flat, with the pin fitting into a small receptacle below so it can be spun with little resistance (bit like a spinning top toy). When rotated at a high-speed simply by pulling on a cord, the centrifugal force generated would keep the fan spinning for a number of minutes, creating enough momentum to extract the hot air from most rooms efficiently into a room above.

The fan would be housed in a concertina tube, so that it's easy to adjust its length. Using a plastic gridded cover for the top with the fan attached underneath for fixture support via the floorboards and a plastic gridded cover for bottom.

Some added features to consider are that the fan must, when it comes to rest, seal the tube and the cord returns to its starting position.

Another alternative is to use a clockwork action, but I wanted to 'keep it simple stupid', as they say.

Patrick: Wouldn't a trapdoor to upstairs do? I'm reminded of the Native Americans who, seeing the first European settlers, smiled at them running around all day in a sweat gathering firewood so they could keep warm. Snow isn't all bad news - it's great at disguising eyesores.

Mark: Have you not heard of sunglasses?

Patrick: Rose-tinted snow goggles, you mean? There might be a case for covering large tracts of industrialised urban landscape with synthetic snow to hide how awful some of it is.

Mark: Lewisham now, after the town planner made it into a giant soulless roundabout and police station, springs to mind.

Patrick: Snow is also a medium for low-cost advertising. Media agency Curb recently made a splash on behalf of its clients by stamping their logo prominently at strategic locations, which were then filmed by the news teams. Football pitches could be engineered so that their under-pitch heating was arranged to melt in a pattern revealing the name of their sponsors.

Finally, I fancy the idea of snow chains in which the links are reconfigurable to allow users to advertise their après-ski entertainment. They might just say "...Party --> Party --> Party -->..."

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A search carried out by the British Library Research Service ([www.bl.uk/research](http://www.bl.uk/research)) on 'manually powered extraction fan' revealed nothing, but on 'extractor fans' alone there were many, here are five of them, patents US4598632, JP2007247913, CA2289896, GB1470139 and GB2166294 which can be viewed on Espacenet.

Send your thoughts to [engtechmag@theiet.org](mailto:engtechmag@theiet.org).

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