this the controlling step. Too low and the chocolate will run out irrespective of the shaker setting, too high and the shell will be thick, uneven and too heavy. The moulds are then returned upright, cooled, the centre is added and a back or seal is applied as required.

If a biscuit or similar item is to be placed in the shell, the chocolate may be left uncooled to make good contact and to prevent the formation of air pockets between the chocolate and the inserted item.

Other methods of shell forming are described in Section 14.2.15.

### 14.2.8 Centre filling

Centre filling is crucial to the quality of the finished item. Overdosing leads to leaking sweets and can contaminate the backing-off chocolate. Under-filling gives a poor eat due to a thick back and not enough centre. If the filling is too warm it can de-temper the shell, leaving a grey colouration, possibly leading to bloom, as well as sticking in the mould. If the centre is too cold it will not flow uniformly to form a flat surface. This leads to poor sweet backs, possible leaking sweets and contamination of the backing-off chocolate. Air bubbles can also be trapped around a cold (viscous) centre giving weight control problems.

The centre may cost more (nut pastes, ganaches) or less (fondants, frappés, caramels) than the chocolate, so incorrect filling can be expensive. If the centre is less expensive the correct proportions must still be maintained for quality reasons.

The centre may be more (fondant, caramel, syrups) or less (whipped or fat-based crèmes) dense than the chocolate, or almost the same (pralines, gianduja). It is important to be aware of the effect of each of the filling masses used on a line.

There are contraction differences between fat- and fondant-based centres. Generally, fondants will contract less than fat-based centres. This can cause problems in shell moulding since pressure may build up in the centre during cooling resulting in cracks in the chocolate and possibly leakage of water-based centres.

If the centre is a solid piece, it must be correctly positioned inside the shell so that it is completely coated with chocolate during the backing off. Exposed centres such as wafers and biscuits may have a shorter shelf life because of moisture pick up and changes in texture.

### 14.2.9 Backing off

There are several ways to put a back on a product. Ideally a separate temperer is used to supply the backing-off chocolate, to avoid contamination from any returns (e.g. some of the centre material may be scraped into this chocolate), to avoid pumping the tempered mass a long distance and also to allow a lower degree of temper or a slightly higher fat content, which will make producing a flat back easier. If the backs are uneven, problems can appear downstream, particularly in high-speed wrapping machines where good contact between the back of the sweet and the conveyor belts is essential for consistent acceleration.

#### 14.2.9.1 Flood backing off

This is the cheapest method (Figure 14.7), as there is no need to meter the chocolate. Weight control depends on viscosity and scraper efficiency. Soft centres can be pushed out of the shell and contaminate the chocolate and it is difficult to avoid incorporating air bubbles. A static knife across the mould is used to control the flood, with a second one to clean the moulds and improve accuracy. It is essential to use the correct material for the blades and not to apply excess pressure.

#### 14.2.9.2 Deposited backing off

This is more expensive to install than the flood system (Figure 14.8). An accurate volume is applied, but the chocolate viscosity needs to be low enough to enable the chocolate to spread into the corners during the brief period of vibration. Cold centres can be difficult to cover. Mould surfaces usually need cleaning to spread the chocolate properly and to remove any excess; this is usually done with a licking roll or scrapers running at right angles to the plant.

#### 14.2.9.3 Sprayed backing off

Spraying the back onto a sweet is an expensive and potentially messy way of adding a back, but it is good for very liquid centres such as liqueurs and is sometimes used to form a first thin untempered coating before being followed by a flood or deposited back. The chocolate viscosity must be low, and extra fat normally has to be added. The mould surface in between the cavities will need cleaning as it is not possible to direct the spray only onto the sweet.

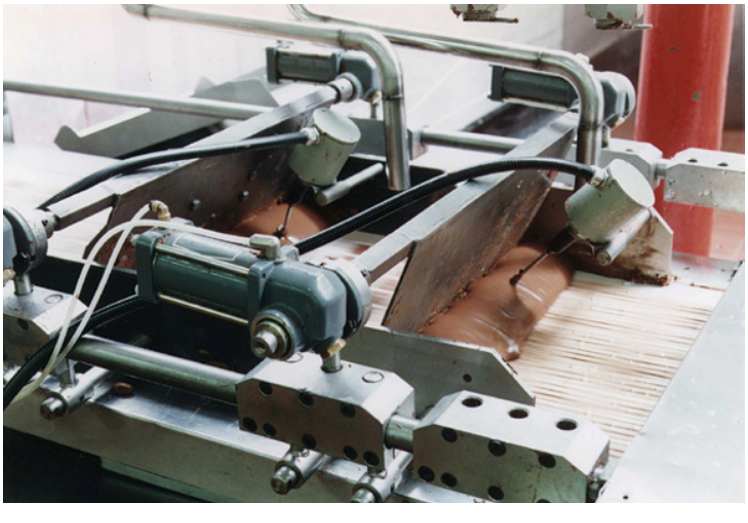

**Figure 14.7** Picture/diagram of flood backing off.