cocoa butter in the chocolate and so the centre must be isolated from the chocolate, in order to prevent migration of the oils, with the consequent blooming and softening of the chocolate (see Chapter 7). In addition, many product centres have a fatty surface which will not allow the chocolate coatings to stick properly during the early stages of the coating process. To make matters worse, should the chocolate coating subsequently crack, a full or partial de-shelling will occur. However, as was mentioned earlier, some of these issues can be reduced or prevented with the careful selection of centres.

Gelatine forms a good continuous film on many centre products and is more elastic and less prone to cracking than an isolating film of gum arabic. The process used for isolating is identical to that for gumming.

16.3.2.3 Stabilising

Stabilising is a step used in the panning procedure to prevent fragile centres from breaking under the tumbling action during the early stages of panning, before the coating itself makes the product strong enough to withstand collisions between the pieces. Some typical fragile centres and the processes used to stabilise them are described below:

1 *Soft raisins* are very difficult to pan. The centres are flexible and the chocolate coating is unable to build up on them without cracking, and this will result in deshelling of the product. To counteract this problem, one of two techniques can be used.
   - **(a)** The raisins are firstly wetted with a high glucose starch syrup, with care being taken to make certain that the liquid penetrates into the wrinkles of the dried fruits. Fine crystalline sugar is then sprinkled onto the wet centres. This solidifies in the cracks and keeps them rigid during the further processing. As with gumming it is desirable to let the product dry in shallow layers overnight.
   - **(b)** A low-viscosity, high-fat chocolate is used to wet the raisins. This is then dried with powdered sugar before the fat sets. The sugar can be coloured with cocoa powder to avoid the formation of a contrasting white layer between the raisin and the chocolate.
2 *Sugar crust coatings on liquid centres* (e.g. liqueurs) will break very easily in a coating pan, releasing the liquid, which in turn causes significant damage to the product bed. In this case a small and slow-turning pan (10 rpm) should be used. Be careful not to break these centres as they are loaded into the pan, and commence wetting the product with a gelatine based masse before starting the pan. Rotation is then started and the wetting completed. As soon as the centres are wet, powdered sugar is added. The pan is stopped immediately after the powder is distributed over the surfaces. The key to success is not to rotate the pan excessively, thereby avoiding cracks in the shells. The treated centres are carefully removed and dried overnight in shallow layers. This process may have to be repeated again the following day.

3 *Flaky centres* (layered, honeycombed etc.) disintegrate as soon they come in contact with a sticky or heavy masse. The product can be sprayed with melted flavoured fat, which impregnates the surface. Once the centre is cooled the fat layers set, strengthening the pieces. This product must then be isolated before applying the chocolate coating.

These examples illustrate ways in which several challenging problems can be solved.

16.3.3 Selection of chocolate and compound coatings

Panning is often called an art, and in reality panning operators do have to be very flexible and adjust the process according to variations in the ingredients and in the environment. Very often insufficient attention is paid to the selection of the chocolate or coatings used in panning.

First, if the product is to be sold with the word chocolate on its packaging, then it is necessary to make sure that the recipe being used conforms to local standards (see Chapter 28). The colour and flavour must also take into account the centre being used. In general, stronger and darker coatings are selected for sweet and strongly flavoured centres, whereas milkier chocolates are required with milder centres so that both flavours can be distinguished.

The coating particle size is based on the end use of the product or the composition of its centre. If it is anticipated that the product will be savoured and slowly melted in the mouth, a coating with a small particle size has to be selected. On the other hand, if the piece is being chewed or the centre has a coarse texture, it is possible to select a grittier coating, which may be cheaper to produce (Chapters 9 and 20).

The plastic viscosity (Chapter 11) of the coating is generally not critical. The real issue is the yield value (value of stress used to sheer coating, tensile strength). Terms like heavy coating (high viscosity, high sheer) and light coating are frequently used. Manufacturers of spray systems (used to spray chocolate onto the tumbling centres in the pan) usually recommend a viscosity range which is best for their equipment. Low yield values are recommended for light and low-density centres, to prevent clumping of the product. Higher yield values may be used if the centres are sufficiently heavy and fast moving to break away from each other. Very liquid coatings have no adhesive properties and tend to "slip" on the product, resulting in bare patches, whilst very high yield value coatings tend to build up unevenly on the centres and also form deposits on the pan walls.

The setting properties of the coating greatly influence the final throughput of the product and this means that there are big differences between panning with chocolates and with compound coatings. Chocolate will be considered first of all. Experts continually argue as to whether chocolate is best used in a tempered or untempered state. There are however reasons why each might in fact be preferred. Untempered chocolate will process somewhat slower, but is easier to