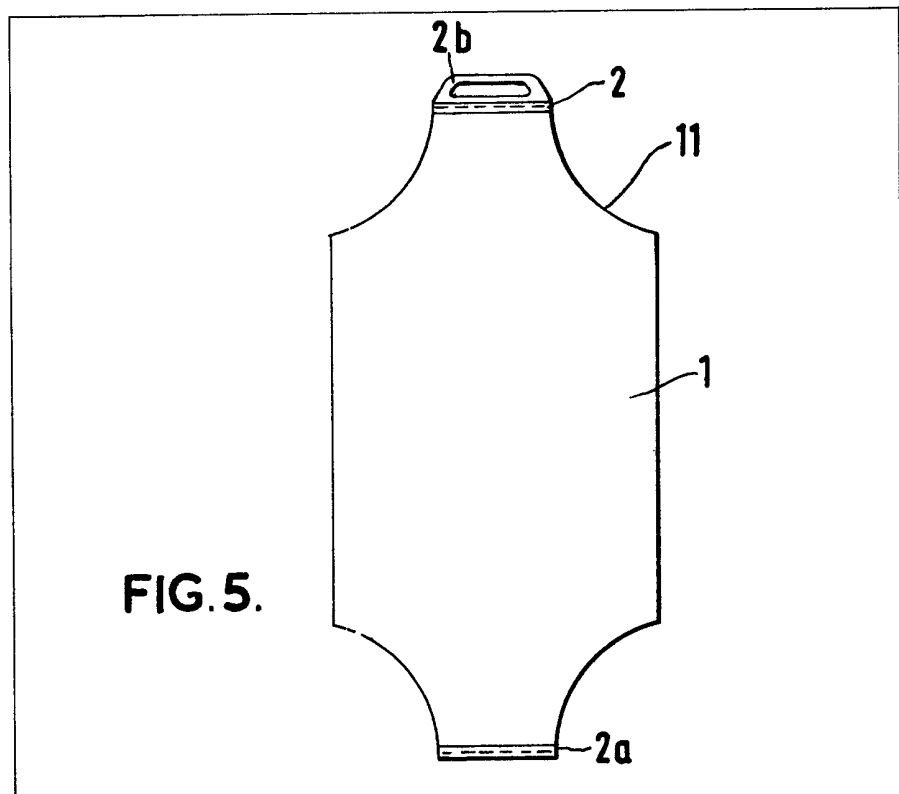


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(54) **Re-usable shrink wrapping**

(57) A heat shrinkable wrapper blank comprising heat shrinkable film 1 or net having releasably joinable or joined parts 2, 2a of a fastener attached to spaced areas thereof is used to form a re-usable wrapping for articles, e.g. bottles, and produces a pack comprising one or more packed articles tautly encircled by a band of a heat shrunk film or net closed by a releasable fastening, preferably a bearing handle 2b.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

FIG. 1.

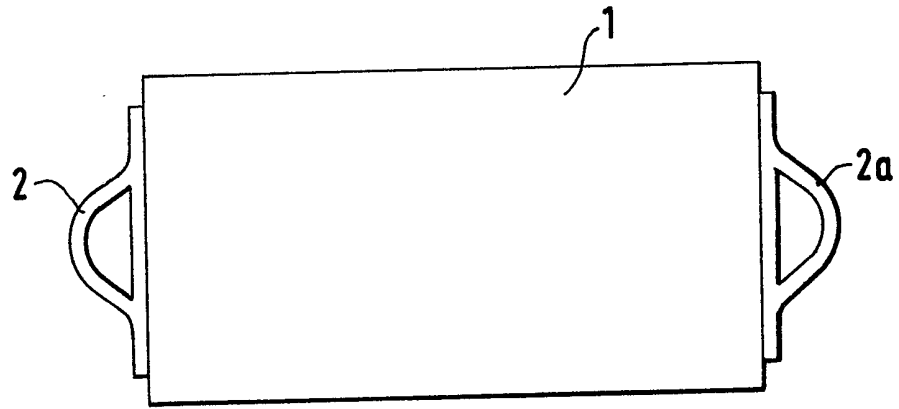
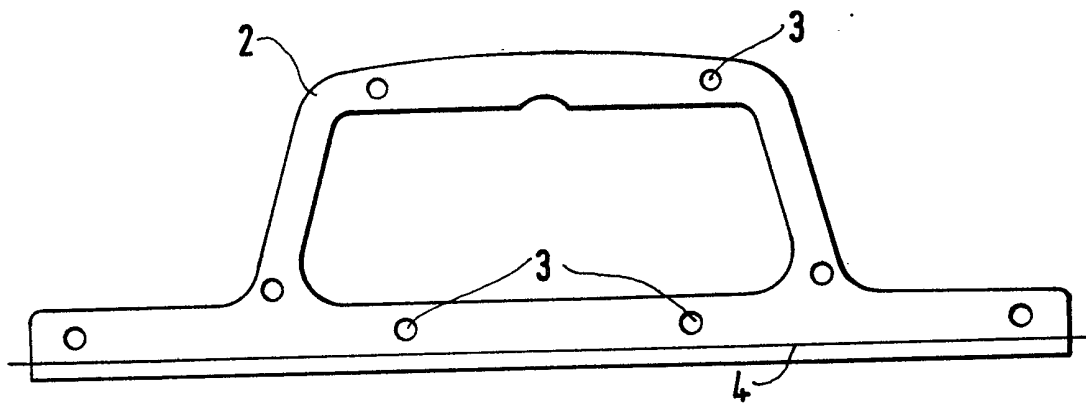


FIG. 2.



2/3

FIG. 3.

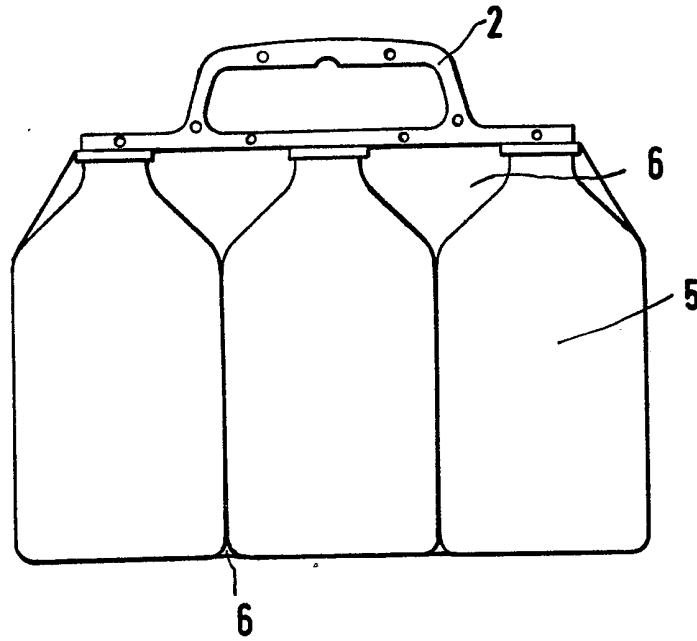
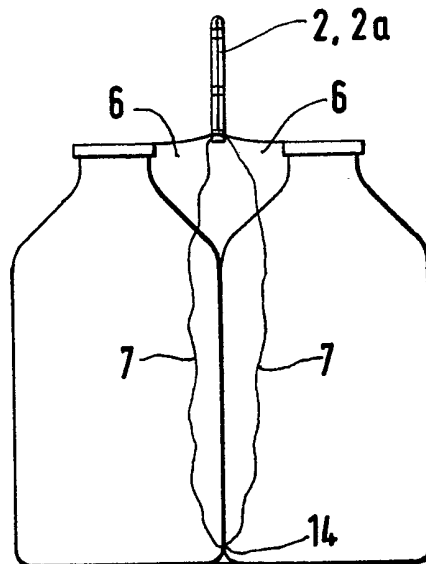
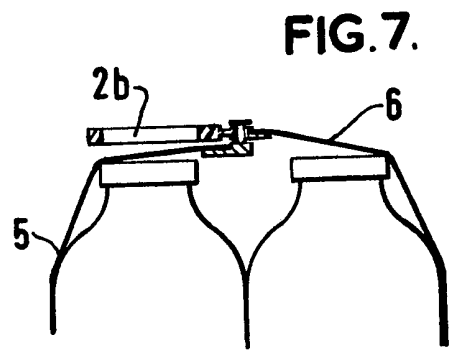
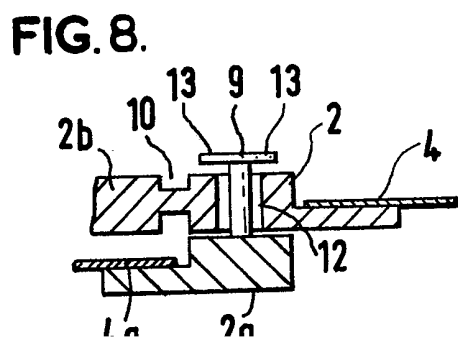
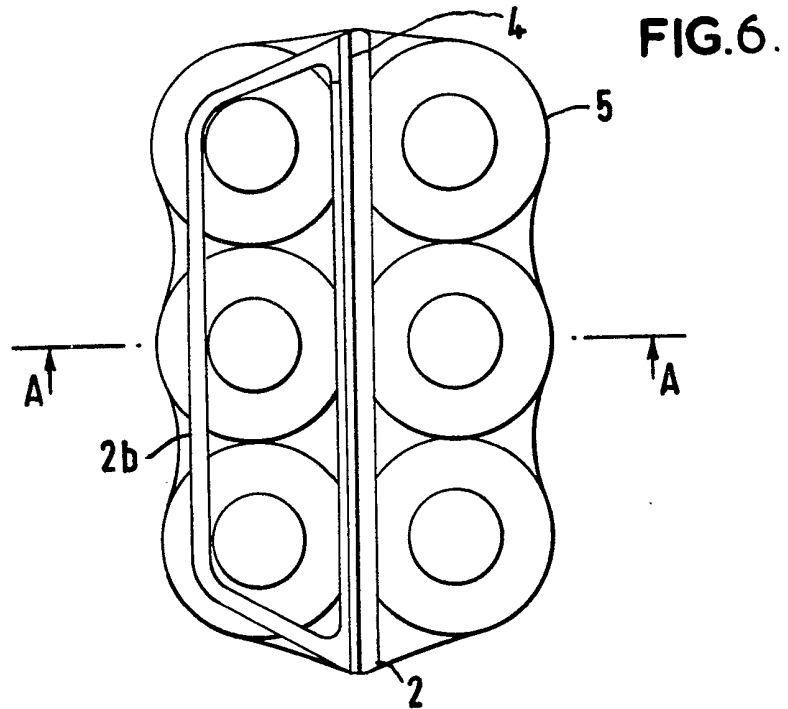
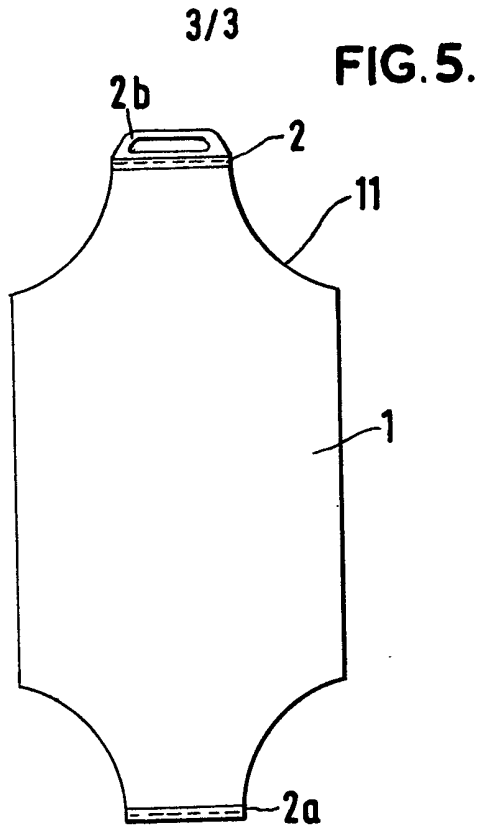


FIG. 4.





## SPECIFICATION

**Re-usable shrink wrapping**

5 The present invention relates to heat shrinkable wrapper blanks and to methods of using heat shrinkable film to form a re-usable wrapping for an article or articles.

Heat shrinkable films are widely used for packaging various articles. In particular, bottles or cans sometimes have their tops supported in a cardboard or plastics member before being completely covered in heat shrinkable film which is then shrunk to tightly compress the bottles or cans to form a "carry home" pack.

Such previously used packs must be torn or cut open to gain access to the contents and are therefore not re-usable. The packaging material must be discarded as refuse. It is substantially impossible to repack the bottles or cans when empty to carry them away for disposal.

The invention provides a process of wrapping one or more articles, which process comprises encircling the article or articles with a heat-shrinkable film having attached to spaced areas thereof releasably joined parts of a fastener, and applying heat to shrink the film taut over the article or articles, to form a re-usable wrapping around the article or articles. The invention also provides a wrapping blank suitable for use in such a process. One embodiment of a suitable blank comprises a heat shrinkable film having releasably joinable parts of a fastener attached to spaced areas thereof. Such a blank may be used for forming a re-usable wrapping in a process of wrapping one or more articles, by engaging together the two parts of the fastener in such a manner as to encircle the article or articles with the film, and applying heat to shrink the film taut over the articles or articles.

10 In an alternative embodiment of a suitable blank a generally similar releasable fastener may be provided, having a heat shrinkable film attached to a part thereof, the parts of the fastener being releasably joined i.e. as they will be in the finished closed wrapping. To form a re-usable wrapping, the film is passed around the article or articles and an area of it at or close to the free end is attached to a second part of the fastener (for example by means of projections on the second part of the fastener as discussed below). The film is then heat-shrunk as before.

The packs so formed can be opened by releasing the fastener and peeling back the shrunk film from the contents. Once the contents are removed, the pack may be re-used for packaging articles of a similar size and shape or the original articles may be replaced in the packaging for further transport.

It should generally be ensured that the areas of the film to which the two parts of the fastener are attached do not come into contact with each other during the heat shrinking, since this will normally result in them becoming welded together so that the pack is liable to be damaged when it is opened and cannot easily be re-used. To this end, it should be ensured that the blank is not of excessive width.

15 Preferably the parts of the fastener are attached to

opposite ends of a sheet of the heat shrinkable film. In this case the parts of the fastener are preferably attached to the middle region of the ends, and the corners of the sheet are cut away, to avoid the problem of welding during heat shrinking, mentioned above.

20 It is preferred that at least one part of the fastener bear a handle, by means of which the pack may be transported. Preferably the handle is hinged on the part of the fastener which bears it. The hinge may suitably be such as to allow the handle to lie flat on the pack once it is formed to facilitate the stacking of such packs.

The fastener, and, when present the handle preferably comprise a thermoplastic material to which the film may be heat-welded. When the film is of polyethylene, the fastener, and when present, the handle, are preferably of injection-moulded polyethylene. If the parts of the fastener, and, when present, the handle, are to be exposed to heat during heat-shrinking of the film, they are preferably of sufficient mass as not to be deformed during the heat shrinking. The fastener may be attached to the film blank by welding, e.g. by impulse welding. The film will usually be welded to an outside surface of the fastener.

In one embodiment of the invention, the film may be attached to at least one part of the fastener, by the use of locating means, for example in the form of small peg or hook-like projections provided on the parts of the fastener. The film is attached to the respective part by locating it on the projections generally loosely. During the subsequent heat-shrinking, the film shrinks around the articles so as to engage the projections tightly. If the holes are of a suitable size the shrinkage of the film may also cause it to grip the projections, and it may also become welded to the parts of the fastener by the heat applied.

25 In this embodiment, although the film may be a continuous sheet, which is pierced by the projections during formation of the blank, it may alternatively have the form of a perforated sheet or net. It should be understood that the term "film" as used herein includes such perforated sheets and nets. A perforated sheet having elliptical perforations approximately 6mm x 9mm has been found suitable for this purpose.

Heat shrinkable film in the form of a perforated sheet or net may also be used in other embodiments of this invention.

The heat shrinkable film may be any heat-shrinkable thermoplastics film, for example, a heat-shrinkable film of low, medium or high-density polyethylene, polyvinyl-chloride, polypropylene, ethylene-vinyl acetate copolymer or polyvinylidene chloride. The film and the parts of the fastener to which it is attached should preferably be suitably chosen to facilitate heat-welding of the film to the parts of the fastener. The film is preferably of the kind having a shrinkage capacity of greater than 60% in a principal shrinkage direction. It preferably also has a shrinkage capacity of from 10-20% transverse to the principal shrinkage direction. Suitably therefore, and particularly when the fastener and, when

present, the handle are of polyethylene, the film may be a polyethylene film of the type designated SBZ in PFMS 4/68 as amended in August 1970 (issued by the Packaging Films Manufacturers Association).

5 The film is preferably of an extra low slip type normally designated "EL" to make stacking of packs formed from the material safer.

Preferably the complementary parts of the fastener are spaced along the principal shrinkage direction of the film.

Heat shrinkable blanks according to the invention may be used to wrap very different kinds of articles but in particular they may be used to wrap bottles, e.g. wide necked bottles.

15 It is preferred that each blank should be separate, and that blanks should be supplied for use in stacks. However, a plurality of fasteners may be attached to a film taken from a reel, the complementary parts of each fastener preferably being attached to the opposite side edges of the film. For use, the film may be cut up to form a plurality of separate blanks before use, or alternatively the film may be heat shrunk around the articles with the blanks still joined, and subsequently cut up to form separate packs.

It is to be understood that the invention includes within its scope a pack comprising one or more packed articles tautly encircled by a band of heat shrunk film closed by a releasable fastener.

30 After heat shrinkage, the film forms a tray-like structure about the base of a group of articles in the pack inhibiting lateral movement of items of the contents in the pack.

The formation of an upturn of film around the base of the article or articles may be assisted by suitably placed jets of air during shrinkage, in a manner known *per se*. Other means for inhibiting lateral movement, for example a cardboard tray or yoke as conventionally used in shrink wrapping, may also be incorporated in the pack.

The parts of the fastener should be releasably joinable but sufficiently secure, when joined, to withstand the lateral force exerted by the shrinking of the film. The fastener may comprise for instance one or more T-shaped projections on one part of the fastener co-operating with slots or holes in the other part of the fastener, or a conventional snap-fastener.

A number of specific embodiments of the invention will now be described with reference to the accompanying drawings in which:

*Figure 1* is a plan view of a heat shrinkable wrapper blank according to the invention,

*Figure 2* is an enlarged view of the part of the fastener at one end of the blank of *Figure 1*,

55 *Figure 3* is a schematic elevation of a six bottle pack made from a blank of *Figure 1*,

*Figure 4* is an end elevation of the pack shown in *Figure 3*,

*Figure 5* is a plan view of an alternative heat shrinkable wrapper blank according to the invention,

*Figure 6* is a top view of a six bottle pack made from the heat shrinkable wrapper blank of *Figure 5*, on a larger scale.

*Figure 7* is a section on A-A of *Figure 6*, and,

65 *Figure 8* is a larger scale sectional view of the

fastener as shown in *Figure 7*.

The blank shown in *Figure 1* comprises a sheet of heat shrinkable polyethylene film 1. The sheet is rectangular and is welded at each of its narrow ends to a part 2, 2a of a releasable fastener of injection moulded polyethylene. Each part of the releasable fastener extends across most of the width of the film.

70 As can be seen from *Figure 2*, the fastener part 2 is provided with eight press stud halves 3 for co-operating with corresponding press stud halves on the other fastener part 2a. The film is welded to the fastener part 2 over the area indicated by the numeral 4.

80 In use, a number of articles e.g. six bottles, may be stood in the centre of the blank 1 and the fastener parts 2, 2a may be joined over the tops of the articles. The assembly is then heat treated to shrink the film taut over the articles to produce a pack of the kind shown in *Figure 3* in which the articles concerned are six identical bottles 5. The heat shrunk film is indicated by the numeral 6.

As best seen in *Figure 4*, the film 6 does not continuously cover the packed articles but leaves a gap defined by the margins 7 of the film down each end of the pack. The centre part 14 of the margin forms an upturn to retain the bottles in the pack. When the fastener 2, 2a is released, therefore, the film may be peeled away from the articles enclosed and the pack may subsequently be reclosed using the fastener. The upturn 14 may be of any height, provided that it does not undesirably interfere with the opening of the pack, and may extend, for example to half the height of the bottles.

90 In the blank shown in *Figure 5*, only the part 2 of the fastener bears a handle portion. The film 1 is generally rectangular but has cut away shoulders 11 extending in a concave arc from the margin of the fastener parts 2, 2a to the long sides of the film 1. The cut-away shoulders help to ensure that the two areas of the film to which the parts 2, 2a of the fasteners are attached do not become welded together during heat-shrinking. The handle portion 2b is hinged to the fastener part 2 by means of the necked portion 10 so that the handle can lie flat on the top of the pack to aid stacking as shown in *Figures 6* and *Figure 7*.

As best seen in *Figure 8*, the parts 2 and 2a of the fastener are provided with positive interlock means comprising T shaped projections 9 on the part 2a and corresponding holes 12 in the part 2. During closure of the fastener, the lugs 13 of projection 9 are deformed to allow passage of the T-shaped projections 9 through the hole 12. They then spring back to the position shown in *Figure 8* to lock the two parts of the fastener together.

120 In an example of preparing a pack in accordance with the invention, a blank measuring 14" by 31" was cut from SBZ polyethylene film, 100 microns thick. The long direction of the blank corresponded with the machine direction (and hence the direction of maximum shrink capability) of the film. A pair of conventional moulded polyethylene handles with integral press stud fasteners were welded to the short edges of the blank so that the handle centres

lay on the centre line of the blank.

The corners of the film were cut away from the edge of the handle to a point 6" down each of the long sides of the film to provide easy opening of the pack. Six bottles each of approximately 500 ml capacity were placed upon the blank, the end portions of which were then brought up each side of the bottles and closed above them by means of fasteners moulded into the handles. The assembled pack was passed through a shrink tunnel, type 30/15 ST (supplied by Engineering Developments (Farnborough) Limited), set at 190°C air temperature with a belt speed of 9.76 feet per minute, to form a re-usable pack.

#### CLAIMS

1. A heat shrinkable wrapper blank comprising a heat shrinkable film having releasably joinable parts of a fastener attached to spaced areas thereof.
2. A heat shrinkable wrapper blank, comprising a heat shrinkable film having releasably joined parts of a fastener attached thereto.
3. A blank as claimed in claim 1 or claim 2 wherein the parts of the fastener are attached to opposite ends of a sheet of the heat shrinkable film.
4. A blank as claimed in any one of the preceding claims wherein at least one part of the fastener bears a handle.
5. A blank as claimed in claim 4 wherein the or each handle is hinged to the part of the fastener which bears it.
6. A blank as claimed in any one of the preceding claims wherein the film is a polypropylene, polyvinylchloride, polyvinylidene chloride or ethylene-vinyl acetate copolymer film.
7. A blank as claimed in any one of claims 1 to 5 wherein the film is polyethylene film.
8. A blank as claimed in any one of the preceding claims wherein the parts of the fastener are heat-welded to the film.
9. A blank as claimed in any one of the preceding claims wherein the film has a shrinkage capacity of greater than 60% in a principal shrinkage direction.
10. A blank as claimed in claim 9 wherein the film has a shrinkage capacity of from 10 to 20% transverse to the principal shrinkage direction.
11. A blank as claimed in claim 9 or claim 10 wherein the parts of the fastener are spaced along the principal shrinkage direction.
12. A blank as claimed in any one of the preceding claims wherein at least one part of the fastener has a plurality of projections for attaching the film to the part.
13. A blank as claimed in any one of the preceding claims wherein the heat-shrinkable film is a perforated sheet or net.
14. A heat-shrinkable wrapper blank substantially as hereinbefore described with reference to and as illustrated in Figure 1 or Figure 5 of the accompanying drawings.
15. A process of wrapping one or more articles which process comprises encircling the article or articles with a heat-shrinkable film having attached to spaced areas thereof releasably joined parts of a

fastener, and applying heat to shrink the film taut over the article or articles, to form a re-usable wrapping around the article or articles.

16. A process of wrapping one or more articles which process comprises engaging together releasably joinable parts of a fastener attached to spaced areas of a heat-shrinkable film in such a manner as to encircle the article or articles with the film, and applying heat to shrink the film taut over the article or articles to form a re-usable wrapping around the article or articles.

17. A process as claimed in claim 15 or claim 16 wherein the article or articles are wrapped using a blank as claimed in any one of claims 1 to 14.
18. A process as claimed in any one of claims 15 to 17 wherein the blank is as claimed in claim 12 and the film becomes welded to at least one part of the fastener during the heat shrinking.
19. A process as claimed in any one of claims 15 to 18 wherein the or each article wrapped is a bottle.
20. A process of wrapping articles substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 4 or 5 to 8 of the accompanying drawings.
21. A wrapped article obtained by a process as claimed in any one of claims 15 to 20.
22. A re-usable pack comprising one or more packed articles tautly encircled by a band of heat shrunk film closed by a releasable fastening.
23. A pack substantially as hereinbefore described with reference to and as illustrated in Figures 2 to 4 or 6 to 8 of the accompanying drawings.