

(12) **UK Patent Application** (19) **GB** (11) **2 238 974 A** (13)

(43) Date of A publication 19.06.1991

(21) Application No 8928173.7

(22) Date of filing 13.12.1989

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(51) INT CL⁵
B29C 49/76

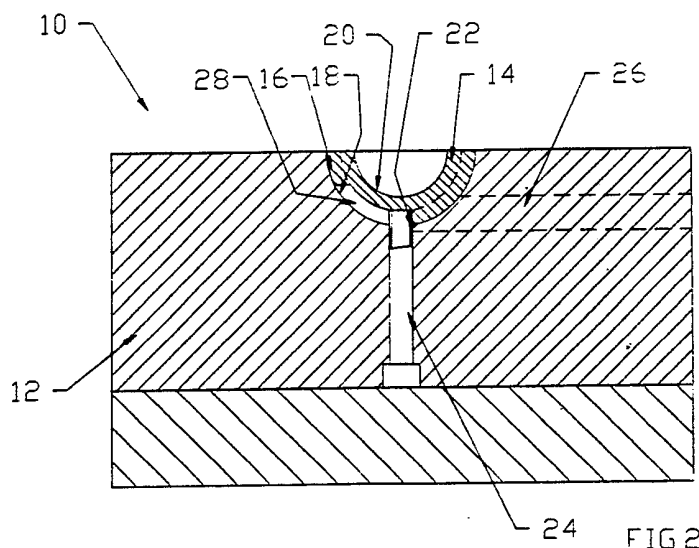
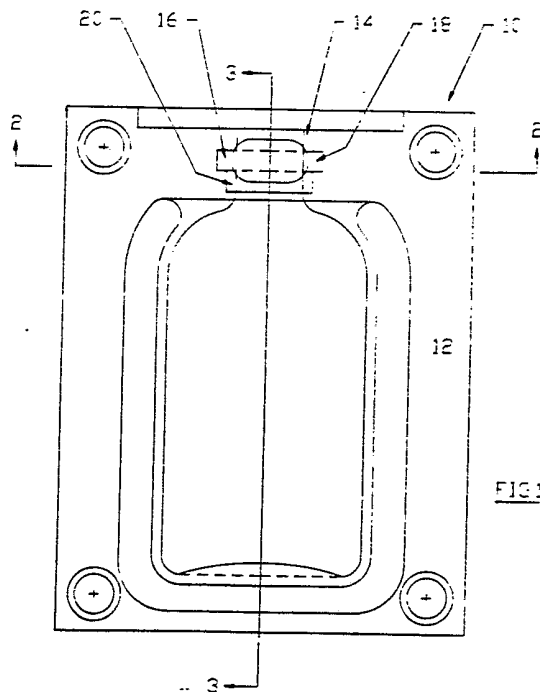
(52) UK CL (Edition K)
**B5A AD25 AT15E A1R420 A1R432 A2A2 A2E12A
A2E6 A2E7A A2E7B**

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(58) Field of search
UK CL (Edition K) **B5A AD24A AD25 AM4 ANA ANX
AT15E AT15F
INT CL⁵ B29C**

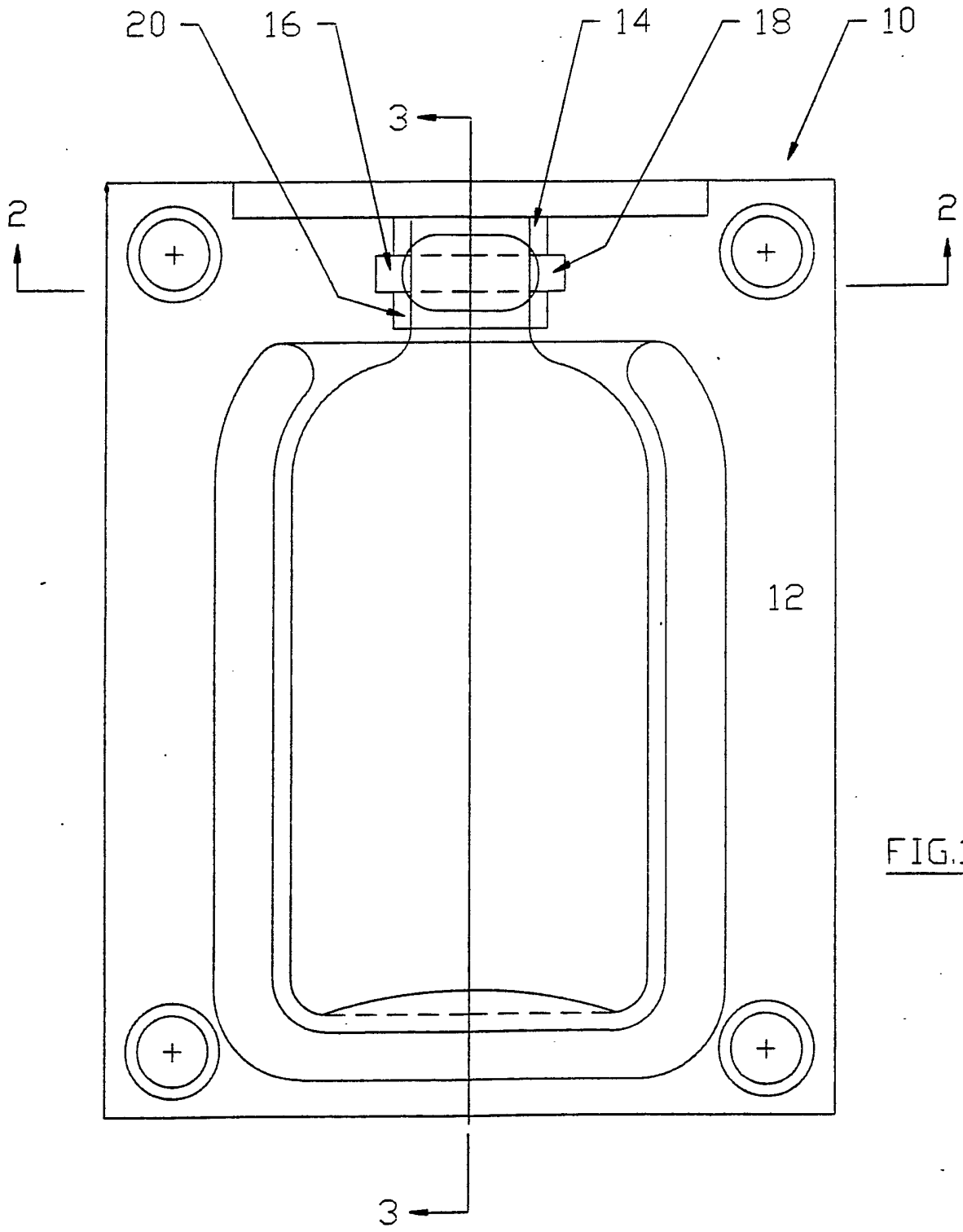
(54) **Securing neck inserts into moulds for plastics bottles**

(57) A bottle mould for a necked plastics bottle, comprises two mould shells (10) which fit together to define a mould cavity having a required bottle shape, each shell (10) each incorporating an insert (14) defining the required neck shape, e.g. a screw thread shape, each insert being fixed and sealed in position in the mould shell by an adhesive, e.g. cyano-acrylate, or epoxy, permitting replacement upon knocking out of the existing insert. Each insert may be located by a screw (24), whilst the adhesive is setting. It may be of aluminium bronze, or of beryllium copper alloy, to provide higher heat conductivity than the shell which may be of steel, or aluminum. The insert may be located in the shell at a respective semi-circular rib (16) and groove (18).



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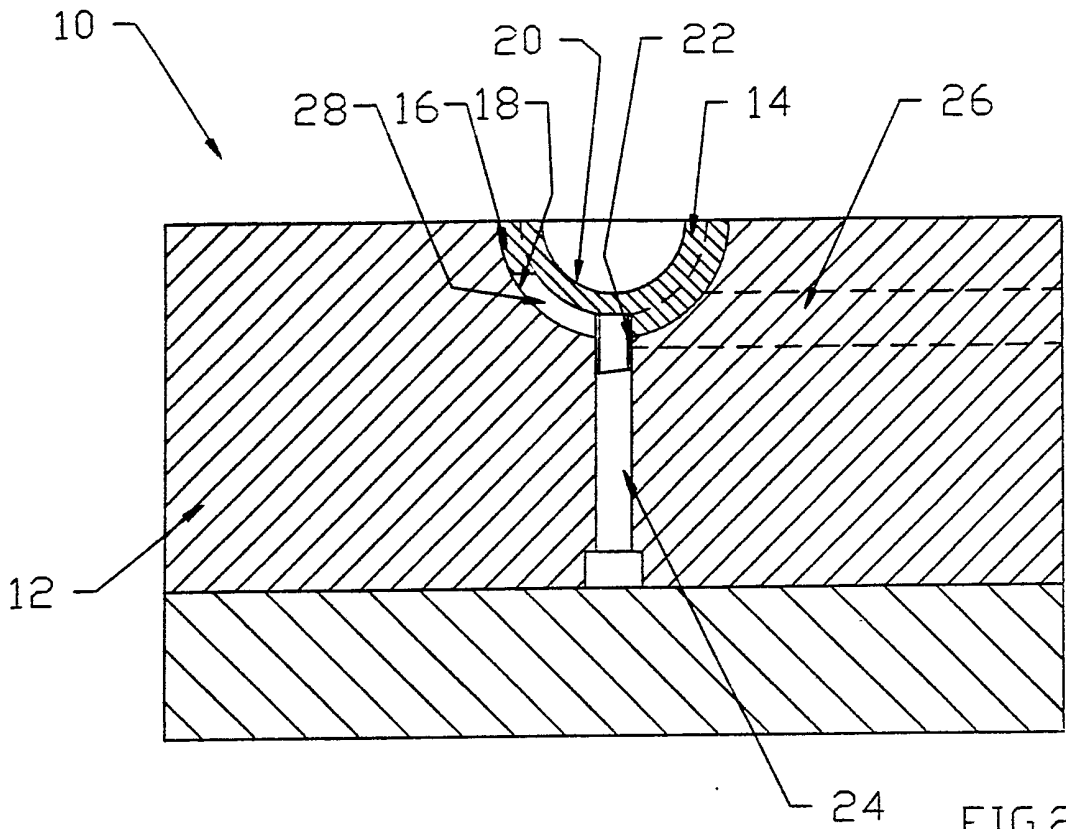


FIG. 2

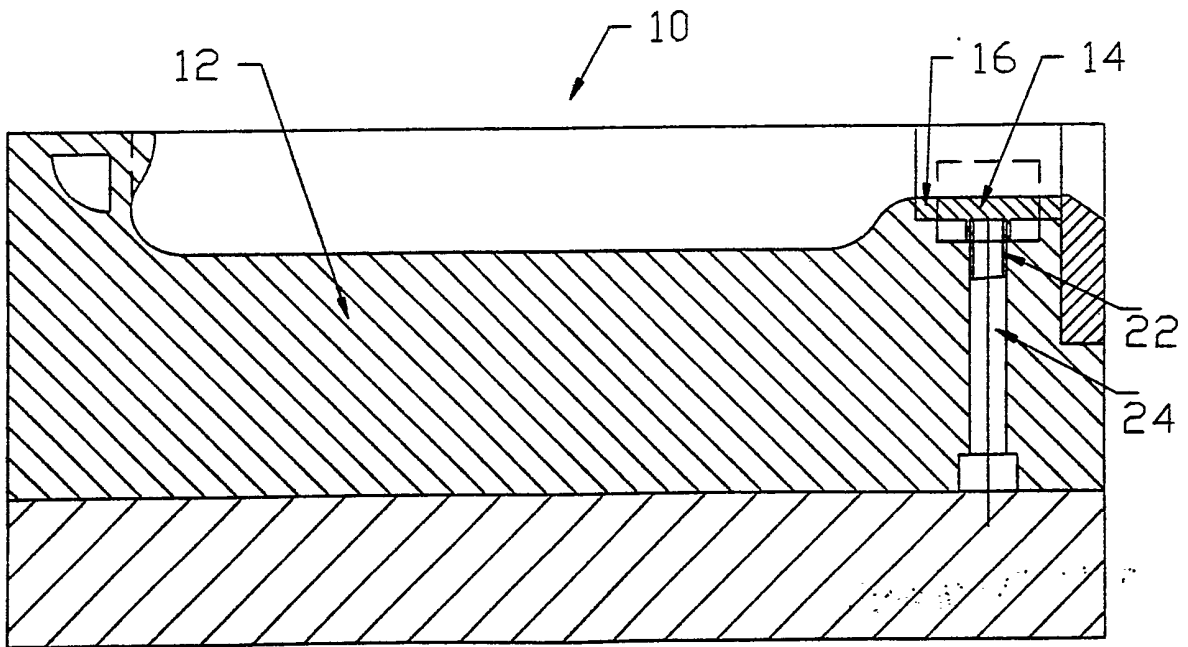


FIG. 3

Improvements in Bottle Moulds

This invention relates to a mould for the production of necked bottles, in particular moulded plastics bottles.

A problem in the moulding of necked bottles lies in the
5 formation of the bottle neck. Typically the mould shells
defining the shape of the bottle each comprise a plurality
of parts, which include a part specifically dedicated to
formation of the bottle neck. The design of this part of
the mould shell is often difficult, partly because during
10 moulding there is a special requirement for a higher rate
of transfer of heat out of the moulding material at this
region of the mould than at the main body of the mould
cavity where the bottle wall is formed. An object of the
invention is to provide assistance in the solution of this
15 problem.

According to the invention, there is provided a bottle mould
for a necked bottle, comprising two mould shells which fit
together to define a mould cavity having the required bottle
20 shape, wherein in the region of the cavity where the neck is
to be formed the mould shells incorporate respective inserts
defining the shape required for the bottle neck, each insert
being fixed to the adjacent part of the mould shell in which
it is incorporated by means of a fixing and sealing adhesive.
25

Preferably, the insert is formed of a metal or alloy of
higher heat conductivity than the main portion of the mould
shell. For example, whereas the main portion of the mould
shell may be made of steel or aluminium, the insert may be
30 made of aluminium-bronze or beryllium-copper alloy.

The insert is preferably generally in the form of a semi-cylindrical member having an external circularly extending rib which locates in a corresponding groove in a semi-cylindrical recess in the adjacent part of the mould shell.

5 Passages in the said mould shell part behind a portion of the length of the groove may provide for passage of cooling fluid, and an adjacent portion of the rib of the insert may be cut away to assist fluid flow.

10 Additionally, a hole in the said mould shell part may provide for insertion, through said part and into the insert, of a holding screw which holds the insert in position while the fixing and sealing adhesive is setting. The screw can be left in place after serving its purpose, but is
15 subsequently removable if desired.

A convenient adhesive is a commercially available adhesive of the cyano-acrylate or epoxy resin type.

20 The insert is usually cut on its interior wall with a formation for production of a screwthread on the bottle neck, or a formation for any other convenient kind of bottle closure such as a push-on cap. One advantage of the invention, amongst others, is that the insert can be knocked
25 out for replacement by another insert having formations for producing a different screwthread. Moreover, replacement of the insert for any other reason is also readily possible, without requiring any redesign of any one or more main parts of the mould shell.

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An embodiment of the invention is illustrated by way of example in the following description, making reference to the accompanying drawings, in which:-

Figure 1 is a plan view of a bottle mould shell; and

Figures 2 and 3 are respectively cross-sectional views on the lines 2-2 and 3-3 of Figure 1.

5

The drawings show one shell 10 of a pair of similar mould shells which are brought together to define the shape of the mould cavity in which the bottle is produced by blow moulding, in a conventional manner.

10

The mould shell 10 has a main body 12, provided with not shown cooling channels, and which in practice may be formed in a plurality of separate but united members or parts, and for production of the bottle neck, an insert 14 which is fixed in position to the adjacent part of the main body by a fixing and sealing adhesive, such as a cyano-acrylate or an epoxy resin adhesive.

The insert 14 comprises a generally semi-cylindrical element or ring having an external rib 16 which fits into a corresponding semi-circular groove 18 in a semi-cylindrical recess 20 in the main body 12 of the shell. The fixing and sealing adhesive is employed at the mating semi-cylindrical surfaces of the recess 20 and the insert 14, although preferably not at the cooperating rib 16 and groove 18.

Behind the insert 14 the main body 12 is formed with a screw hole 22. A holding screw 24 passes through this hole 22 to hold the insert in position while the adhesive is setting.

30

Means are also provided for passage of cooling water for extracting heat from the moulding material in the region of the neck, via the insert 14, which is made of a high heat conductivity alloy such as aluminium-bronze or beryllium-

copper. The main shell body 12 may be formed of steel or aluminium, being a less expensive metal of lower heat conductivity. Thus, a water inlet is indicated at 26; a corresponding water outlet is above the plane of the cross-section of Figure 2. A portion of the rib 16 of the insert 14 is cut away, as indicated at 28, to enable cooling water to flow into the cut away below the plane of Figure 2, upwardly at the cut away and out of the cut away above the plane of Figure 2.

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The insert is machined on its inside surface with a formation (not shown) for a bottle closure, e.g. a screw-thread.

15 Various modifications of the above-described and illustrated arrangement are possible within the scope of the invention hereinbefore defined.

Claims

1. A bottle mould for a necked bottle, comprising two mould shells which fit together to define a mould cavity having the required bottle shape, wherein in the region of the cavity where the neck is to be formed the mould shells
5 incorporate respective inserts defining the shape required for the bottle neck, each insert being fixed to the adjacent part of the mould shell in which it is incorporated by means of a fixing and sealing adhesive.

- 10 2. A bottle mould according to claim 1, wherein, in each mould shell, the insert is formed of a metal or alloy of higher conductivity than the main portion of the shell.

- 15 3. A bottle mould according to claim 2, wherein the main portion of the mould shell is made of steel or aluminium and the insert is made of aluminium-bronze or beryllium-copper alloy.

- 20 4. A bottle mould according to any of claims 1 to 3, wherein, in each mould shell, the insert is in the form of a semi-cylindrical member having an external circularly extending rib which locates in a corresponding groove in a semi-circular recess in the adjacent part of the mould
25 shell.

5. A bottle mould according to claim 4, wherein passages in the mould shell behind a portion of the length of the groove provide for passage of cooling fluid.

- 30 6. A bottle mould according to claim 5, wherein an adjacent portion of the rib of the insert is cut away to provide for passage of the cooling fluid.

7. A bottle mould according to any of claims 1 to 6, wherein, in each mould shell, a hole therein provides for passage of a holding screw which holds the insert in position while the adhesive is setting.
- 5
8. A bottle mould according to any of claims 1 to 7, wherein the adhesive is of the cyano-acrylate or the epoxy resin type.
- 10 9. A bottle mould according to claim 4 or any claim appendant thereto, wherein the adhesive is employed at the mating semi-cylindrical surfaces of each mould shell and insert, but not at the cooperating rib and groove.
- 15 10. A bottle mould according to any of claims 1 to 9, wherein the composite insert is cut on its interior wall with a formation for producing a screwthread or other fitment for a bottle closure.
- 20 11. A bottle mould substantially as hereinbefore described with reference to the accompanying drawings.