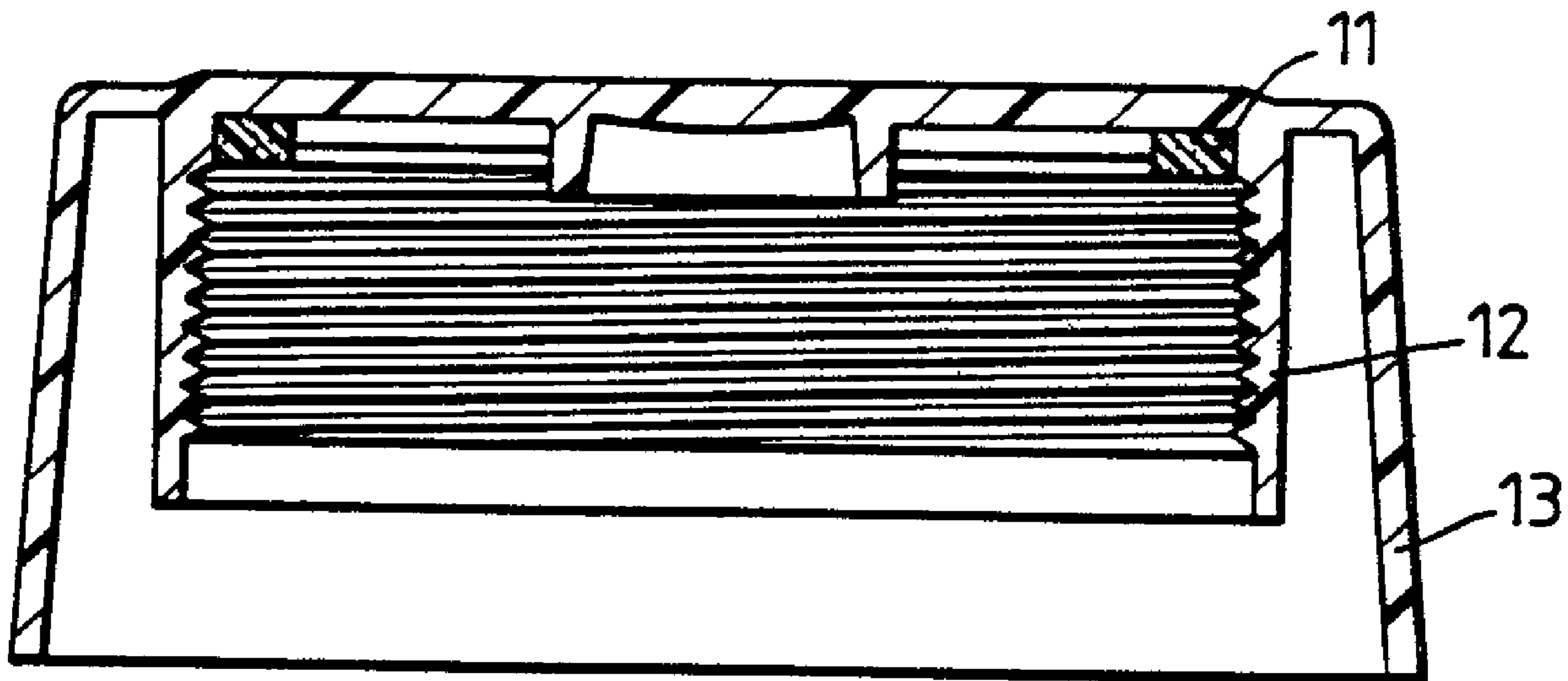




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(57) Abrégé/Abstract:

A closure (4) for an opening of a container (1) includes headspace perfuming means (8) comprising a perfume-impregnated body (9) of compressible, absorbent material, e.g. polyurethane foam, the body (9) preferably being faced with layers of polyethylene (10), wherein at least a portion of the body (8) forms a seal for the closure (4) against the container opening and is thereby shielded from product (36) to be placed in the container (1) while the closure (4) is in place. The sealing action of the perfume-impregnated liner (8) causes excretion of a dose of perfume each time the closure (4) is fitted onto the container mouth, whilst the liner (8) is protected from product (36) within the container (1) while the closure (4) is in place.

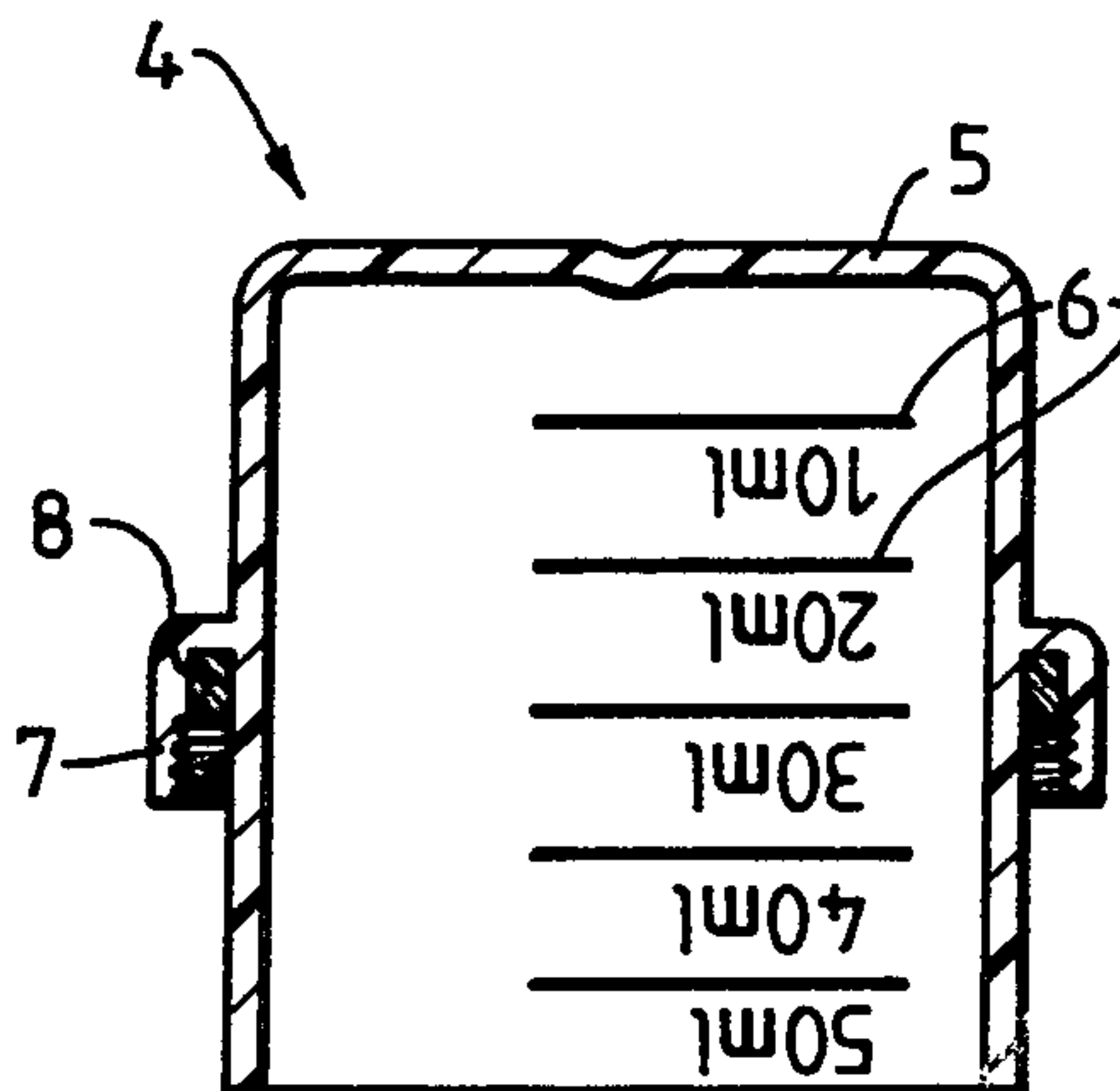




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(57) Abstract

A closure (4) for an opening of a container (1) includes headspace perfuming means (8) comprising a perfume-impregnated body (9) of compressible, absorbent material, e.g. polyurethane foam, the body (9) preferably being faced with layers of polyethylene (10), wherein at least a portion of the body (8) forms a seal for the closure (4) against the container opening and is thereby shielded from product (36) to be placed in the container (1) while the closure (4) is in place. The sealing action of the perfume-impregnated liner (8) causes excretion of a dose of perfume each time the closure (4) is fitted onto the container mouth, whilst the liner (8) is protected from product (36) within the container (1) while the closure (4) is in place.

CONTAINER AND CLOSURE THEREFORFIELD OF THE INVENTION

This invention relates to containers and in particular to containers with a cap closure and headspace perfuming means. Such containers are particularly suitable for housing and delivering liquid detergent compositions.

BACKGROUND OF THE INVENTION AND PRIOR ART

A problem with heavy duty liquid detergent compositions or concentrated liquid detergent compositions is that the structured nature of the liquid tends to trap perfume within it. Thus, although the perfume can be delivered to fabric during the washing process, it is not discernible simply by smelling the container. This is a disadvantage because this technique is the one normally used by consumers to choose their detergent or to be assured that it will deliver an acceptable fragrance.

Another problem occurs when the use of the contents of the container dictates that the perfume level should be kept to a minimum. This can result in the contents having an undesirable smell due to insufficient masking by the perfume, which can be off-putting to a consumer and defeats the object of including the perfume in the first place.

There have been several previous attempts to perfume the headspace of a detergent container. For example, EP-A-0004463 describes a cardboard box for granular solid detergent, in which the cardboard is impregnated with a perfume to provide fragrance to the headspace. The use of cardboard is clearly unsuitable for liquid products and the incorporation of perfume into a plastics container material would tend to trap the more volatile components of the perfume and may damage other components of the perfume.

An alternative proposal is made in US-A-4475663. In this case the perfume is impregnated in an absorbent carrier disc

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which is mounted on the inner wall of the container at a position such that it does not come into direct contact with product placed in the container. A similar proposal to this is seen in US-A-3955706, wherein a sponge-like carrier has embedded in it a block of solid vapourisable air-freshening material and the carrier is adhered to the inner wall of a container, e.g. a bucket or bin, near its top, away from any contents of the container. These techniques are unsuitable for use with bottled liquids that destroy or modify the activity of the perfume. Furthermore, an attempt to place such a perfume-soaked wad away from the liquid by locating it in a cap of the container would be incompatible with caps used for measuring out the contents of the container, the liquid once again coming into contact with the perfume and potentially destroying its action.

A major problem with the above prior art proposals therefore is that the perfume may interact with the contents of the container and no precautions are taken to prevent this occurring.

US-A-4540721 describes the use of oil-based perfumes to create an aqueous emulsion with a water-emulsifiable or water-soluble polymer. The emulsion is dried to trap the perfume within the matrix of the polymer and the matrix is then coated inside the top of a container to fragrance the headspace as the perfume diffuses out of its protective matrix. This is an expensive and complicated technique and also damages the perfume activity.

EP-A-0258991 addresses the above problem for granular contents such as solid bleach compositions and proposes the use of a container cap having a perfumed disc or liner formed by co-melting the fragrance oil with the polymer from which the disc is fabricated. The perfumed disc is protected from coming into contact with bleach granules by means of a perforated cover. The perforations are small enough to prevent ingress of bleach particles to the perfumed disc. This solution to the problem is again expensive and complicated, it is not suitable for application to liquid products and the formation of the disc is

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likely to degrade the perfume activity.

A similar construction of container cap to that of EP-A-0258991 is shown in US-A-4287995, but here the cap is for use on a container for storing air-degradable food products, the object being to remove oxygen from the headspace in the container once the closure cap is in place. To achieve this, the cap incorporates a body of oxygen-absorbent material shielded from the interior of the container by a gas-permeable, water-impermeable membrane. The cap also includes an air-tight seal surrounding the oxygen-absorbing wad, in order to completely isolate the container interior from the atmosphere when the cap is in place. Once again, this proposal is complicated and expensive and it addresses a problem entirely opposite from that of actually promoting the presence of a vapour material within the headspace of the container.

Furthermore, a problem associated with all of the above prior art proposals is that they all rely upon simple diffusion of perfume vapour from whatever means is used to retain the perfume material isolated from the contents of the container. Reliance upon such diffusion is disadvantageous, because it means that replenishment of perfume vapour in the container headspace can be slow to establish itself, which is no good for containers which are required to be perfumed upon repeated, especially rapidly repeated, opening. It also means that the degree of perfuming of the container headspace may be inadequate in the case of necessarily low perfume levels.

A primary object of the present invention therefore is to provide a container closure comprising headspace perfuming means of which at least a portion is adequately isolated from the product to be placed in the container and is constructed and arranged to release perfume into the headspace sufficiently rapidly and to an adequate degree upon closure of the container.

SUMMARY OF THE INVENTION

Accordingly, in a first aspect the present invention

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provides a closure for an opening of a container, the closure including headspace perfuming means comprising a body of compressible, absorbent material for containing perfume to be delivered into the headspace, characterised in that at least a portion of the compressible, absorbent body is constructed and arranged for forming a seal for the closure against the container opening and is thereby prevented from coming into contact with product to be placed in the container while the closure is in place on the container opening.

In a second aspect, the present invention provides a container having an opening fitted with a closure as defined above.

As used herein, the term "closure" is intended to include any form of closure for an opening of a container, especially various kinds of caps which include screw caps, push-on caps, composite caps having a retractable pouring spout and the like. Also, the invention is applicable to any type of container, though containers having mouth-like openings, e.g. bottles, are particularly applicable. Other types of container however, for example drums or cartons, are also within the ambit of applicability of the present invention. The invention is not limited in its application to containers for liquids, although these may be preferred. Solid products as well as liquid products are applicable to utilisation of the present invention.

Also as used herein, the term "headspace" generally means that region of the interior of the container above the level of any product contained therein. It is to be understood, however, that this term also encompasses the situation where what is defined as the "headspace" is a closed void formed beneath the closure cap, for example by means of a labyrinth or baffle, which does not necessarily extend as far into the container as the level of a product within it.

In accordance with the invention, at least part of the perfuming means of the closure is prevented from contacting the product in the container whilst the closure is in place, by

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virtue of that at least part of the perfuming means constituting a sealing member which seals the container opening and thus prevents leakage of perfume into the atmosphere. This means that the perfume will survive at least until the container is opened for the first time, which may, in some instances, be after a period of storage.

A principal advantage of the invention, in using as the sealing member at least part of the body of compressible, absorbent material in which the perfume is impregnated, is that as the closure is put in place on the container opening such as to seal it, the absorbent body is compressed, thereby excreting a small quantity of the absorbed perfume therefrom into the container headspace. This mini-pumping action occurs every time the container is sealed with the closure and, as a consequence, after every such closing operation, the headspace in the container is rapidly given a dose of perfume which is sufficient to provide the desired aesthetic results when the container is next opened, even if it is within a short space of time. Because of the positive dosing through the mini-pumping action, instead of mere diffusion out of the perfume impregnated absorbent body, sufficient perfume content within the headspace is achieved, even if the overall level of perfume in the perfuming means is required to be low.

Advantageously, the body of compressible, absorbent material is in the form of a resilient absorbent liner which is positioned in that part of the closure which abuts the container mouth when the closure is in place. The liner is preferably shaped to match the container opening, so that it fulfils its sealing function when the closure is in place. Since many containers, particularly bottles, have circular mouths, the liner preferably takes the form of a circular or annular disc.

Where the liner is in the form of a circular disc, it will generally be positioned in the base of the closure cap and preferably held in place by a suitable retaining means, for example by means of adhesive or by means of one or more retention lugs, shoulders or the like.

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Where the liner is in the form of an annulus, this is particularly useful for closure caps which themselves act as dosing or measuring means for product to be dispensed from the container. Such closure caps may comprise, for example, a cup-like main body, the open end of which protrudes into the container interior when the closure is fitted on the opening thereof, and extending outwardly and towards the open end of the cap intermediate its closed and open ends is a flare or flange which includes the necessary securing means such as screw threads or push- or snap- fit features, the resilient liner impregnated with the perfume being positioned within this flare or flange and thereby sealingly abutting the walls of the mouth of the container when the closure is secured thereon.

In preferred embodiments, the liner is formed from an open cell plastic foam, preferably polyurethane foam, into which perfume has been loaded by impregnation. The method of impregnation may be entirely conventional, e.g. the perfume may be incorporated during the foaming stage of the liner manufacture, or it may be post-impregnated by simply soaking the liner in the perfume. The compressible, preferably resiliently compressible, nature of the foam liner enables a small dose of perfume to be delivered to the container headspace each time the liner is compressed upon closure of the container. This ensures some fresh release of perfume into the headspace each time the closure is secured which can be detected readily by the consumer when the container is next opened.

In particularly preferred embodiments of the invention, the compressible, absorbent liner body is faced with a membrane which is impermeable to the product to be placed in the container and is preferably water-impermeable. Desirably, however, the membrane is permeable to the perfume vapour. It is preferred that any face, edge or side of the liner which is exposed to the container interior when the closure is in place on the container opening is so faced, in order to avoid or minimise degradation of the perfume by product within the container. Advantageously, and especially in the case of liners in the form of circular or annular discs, at least that face of the disc which faces towards

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the interior of the container is provided with such a membrane. Most preferably, both faces of such liners are so covered, as this provides a most efficient barrier between the contents of the container and the perfume-impregnated foam.

The use of a foam matrix as at least a major part of the compressible, absorbent body solves the problem of stably loading the perfume into the headspace perfuming means, which many prior art proposals have suffered from. In particular, it obviates the use of high-temperature melting processes or the need for special perfume formulations to take account of the modified release from a polymer lattice. The perfume used can therefore contain heat-sensitive or volatile components, thereby widening the choice of perfumes available for use with the present invention. By way of example, the possibility is therefore created of using a different perfume in the headspace of the container from that in the product itself. This allows the headspace to be scented in a manner which is particularly pleasing to the consumer, whilst masking any odours emanating from the product, and the product can contain less volatile perfumes which may make the product more suitable for its intended purpose. For example, the perfume may be substantive to fabric in the case of fabric washing liquids. The use of a perfumed liner also allows lower levels of more volatile perfume components to be used, because the perfume is delivered directly and immediately to the area where it is needed.

Preferred embodiments of the invention will now be described in detail, by way of example only, with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG 1

Figure 1 shows a typical container fitted with a cap closure, which is applicable to preferred embodiments of the invention;

Figure 2 is a cross-sectional view through a cap closure of a first embodiment of the invention;

Figure 3 is a cross-sectional view through a cap

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closure of a second embodiment of the invention;

Figure 4 is an enlarged cross-sectional view of a liner according to the invention;

Figure 5 is a gas-chromatograph showing an analysis of vapour in the headspace of a conventional closed container of a commercially available detergent liquid; and

Figure 6 is a gas-chromatograph showing an analysis of vapour in the headspace of a container of the same detergent liquid, fitted with a closure cap with a perfume-carrying liner in accordance with the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring firstly to Figure 1, a detergent container 1 is in the form of a bottle which is fabricated from a water-impermeable plastics material such as polyethylene. A handle 2 is molded into the container 1 and it is closed by means of a screw-threaded cap 4.

Figure 2 shows a cross-section through a screw-cap 4 of a first embodiment of the invention, which cap also serves as a dosing/measuring means for the purpose of dispensing a desired volume of liquid detergent which is poured out of the container. The cap 4 takes the form of a cup 5 with graduated markings 6. Disposed annularly around the cup 5 is a threaded flare 7 which contains an annular liner 8 which constitutes the perfuming means for delivering perfume to the headspace 3a above product 3b (see Figure 1) in the container.

The liner 8 is shown enlarged in Figure 4. It comprises an inner layer of open cell polyurethane foam 9, which is sandwiched between two layers of polyethylene 10. The polyurethane foam 9 is loaded with perfume oil which has been absorbed into the foam structure, for example by post-foaming impregnation. The amount of perfume oil loaded into the foam layer 9 may depend upon various parameters, such as the potency of the perfume itself, the volatility of the perfume oil, the level of perfume vapour which it is desired to establish within the container headspace and the temperature at which typical

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storage and/or use of the container will occur. A suitable amount of the perfume will therefore generally be set by experience and/or trial and error on the part of the manufacturer.

Figure 3 shows an alternative design of cap which is not designed for use as a measuring aid. In this embodiment, an annular liner 11 (which, in this embodiment, could even be circular) is situated adjacent a threaded skirt 12 and extending outwardly and downwardly from the skirt 12 is a shroud 13 which is designed to be aesthetically pleasing and may, for example, be provided with grip formations on its outer surface. The liner 11 in this embodiment can be structurally the same as the liner 8 of the embodiment of Figure 2, but is not necessarily so, as already mentioned.

In use, when the closure is fitted on the container mouth, as the liner is compressed when brought into sealing abutment with the container mouth walls, the small degree of compression releases a dose of perfume into the container headspace. At the same time, once the closure is in place, because at least part of the liner (and at least substantially all of it) constitutes a sealing member against the container mouth walls, the perfume within the porous foam structure of the liner is effectively isolated from the container headspace and from product within the container. This shielding of the perfume-laden foam is assisted or optimised by the polyethylene facings on the foam layer of the liner.

This sealing action is particularly important in preventing escape of more volatile components of the perfume. This effect can be readily seen from a comparison of Figures 5 and 6, which show gas-chromatography plots of analyses of the perfume concentration in the headspace, with respect to time, of respectively, a conventionally sealed container and a container sealed in accordance with the present invention, both containers containing the same commercially available perfumed, concentrated detergent liquid available under the trade mark SKIP MICRO. The peaks numbered 1 to 8 in Figures 5 and 6 correspond to the

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different individual major components of the perfume.

It can be seen from a comparison of the two chromatographs that the perfume intensity in the container headspace is much greater in the case of the present invention, particularly at longer times.

This shows that use of a liner according to the invention provides the desired benefits as discussed hereinabove.

CLAIMS

1. A closure for a container having a mouth defining an opening, the closure including headspace perfuming means comprising a body of compressible, absorbent material for containing perfume to be delivered into a headspace of the container upon closure of the container, wherein at least a portion of the compressible, absorbent body is constructed and arranged to form a seal for the closure against the container mouth, so that said portion is shielded from product placed in the container while the closure is in place on the container.

2. A closure according to claim 1, wherein the compressible, absorbent body is in the form of a resilient absorbent liner which is positioned in the closure so as to abut the container mouth when the closure is in place on the container.

3. A closure according to claim 1, wherein the compressible, absorbent body is formed of open cell plastics foam impregnated with the perfume.

4. A closure according to claim 3, wherein the foam is polyurethane foam.

5. A closure according to claim 1, wherein at least a face of the compressible, absorbent body which is exposed to the container interior is covered with a product-impermeable membrane.

6. A closure according to claim 5, wherein the body is in the form of a disc having opposite side faces, and wherein one face of the disc comprises said membrane.

7. A closure according to claim 6, wherein both faces of the disc are covered with said membrane.

8. A closure according to claim 5, wherein the membrane is made of polyethylene.

9. A closure according to claim 1, wherein the compressible, absorbent body is in the form of a circular or annular disc.

10. A closure according to claim 9, wherein the body is annular and surrounds a portion of the closure which forms a measuring cap for product to be dispensed from the container.

11. The combination of a container having a mouth defining an opening, and a closure according to claim 1, fitted to the container and closing said mouth.

12. A method of perfuming a headspace within a container having a mouth, the method comprising fitting the container with a closure which includes a perfume-impregnated body of compressible, absorbent material, wherein at least a portion of the compressible absorbent body forms a seal for the closure against the container mouth, the action of fitting the closure onto the container mouth causing excretion of a dose of perfume from the absorbent body into the headspace and the said portion of the absorbent body being shielded from product placed in the container while the closure is in place on the container.

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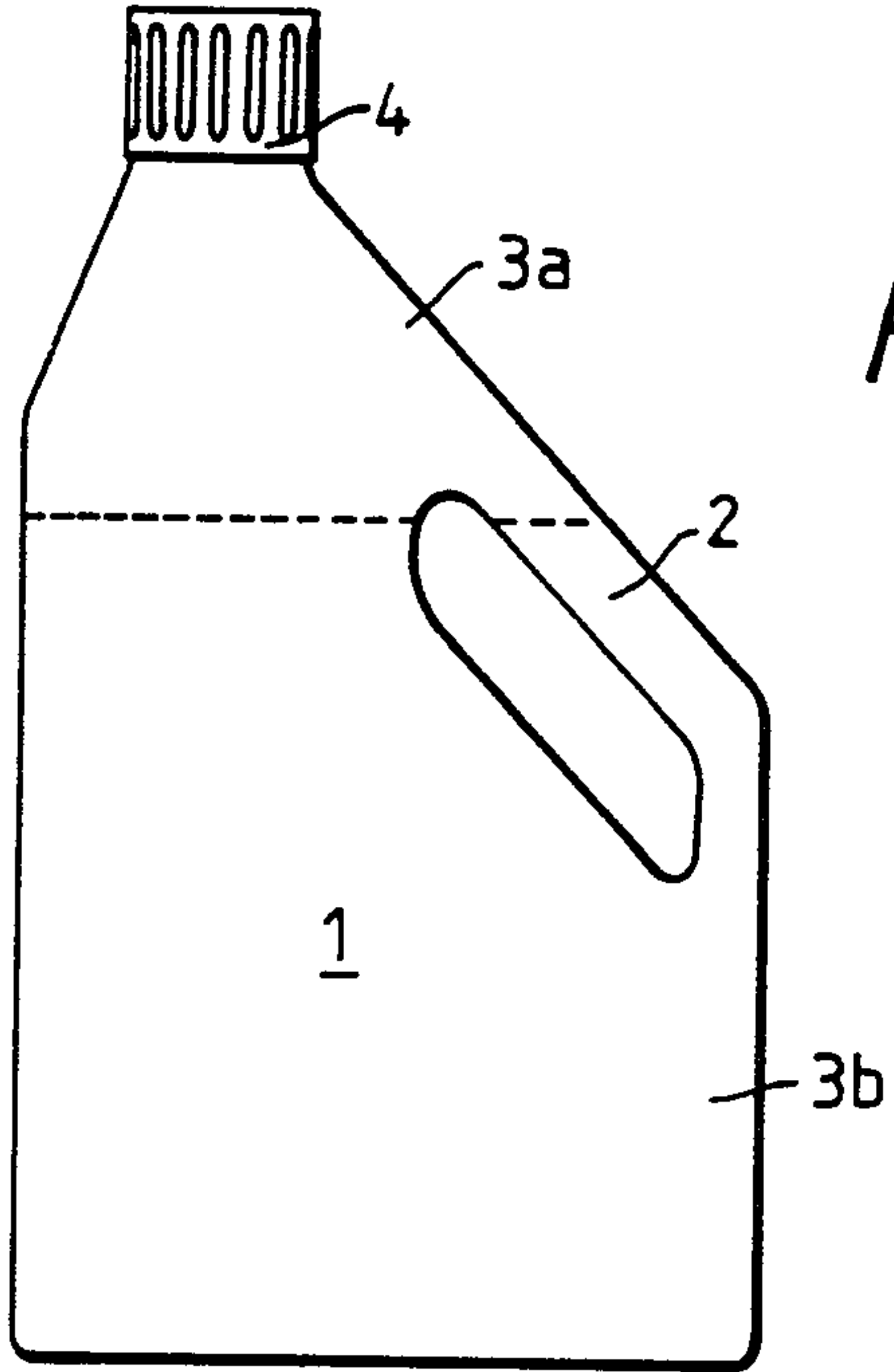


Fig. 1

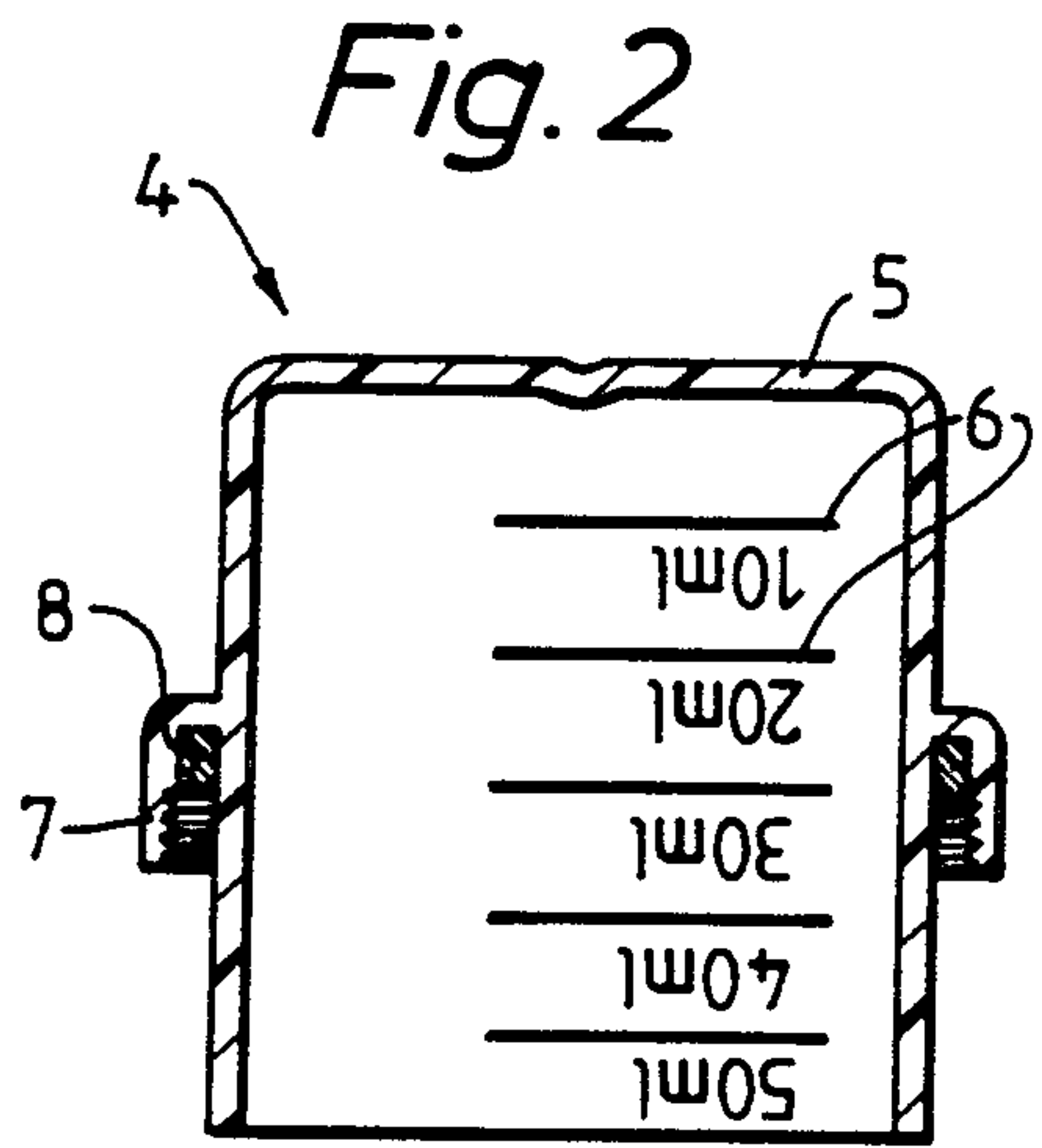


Fig. 2

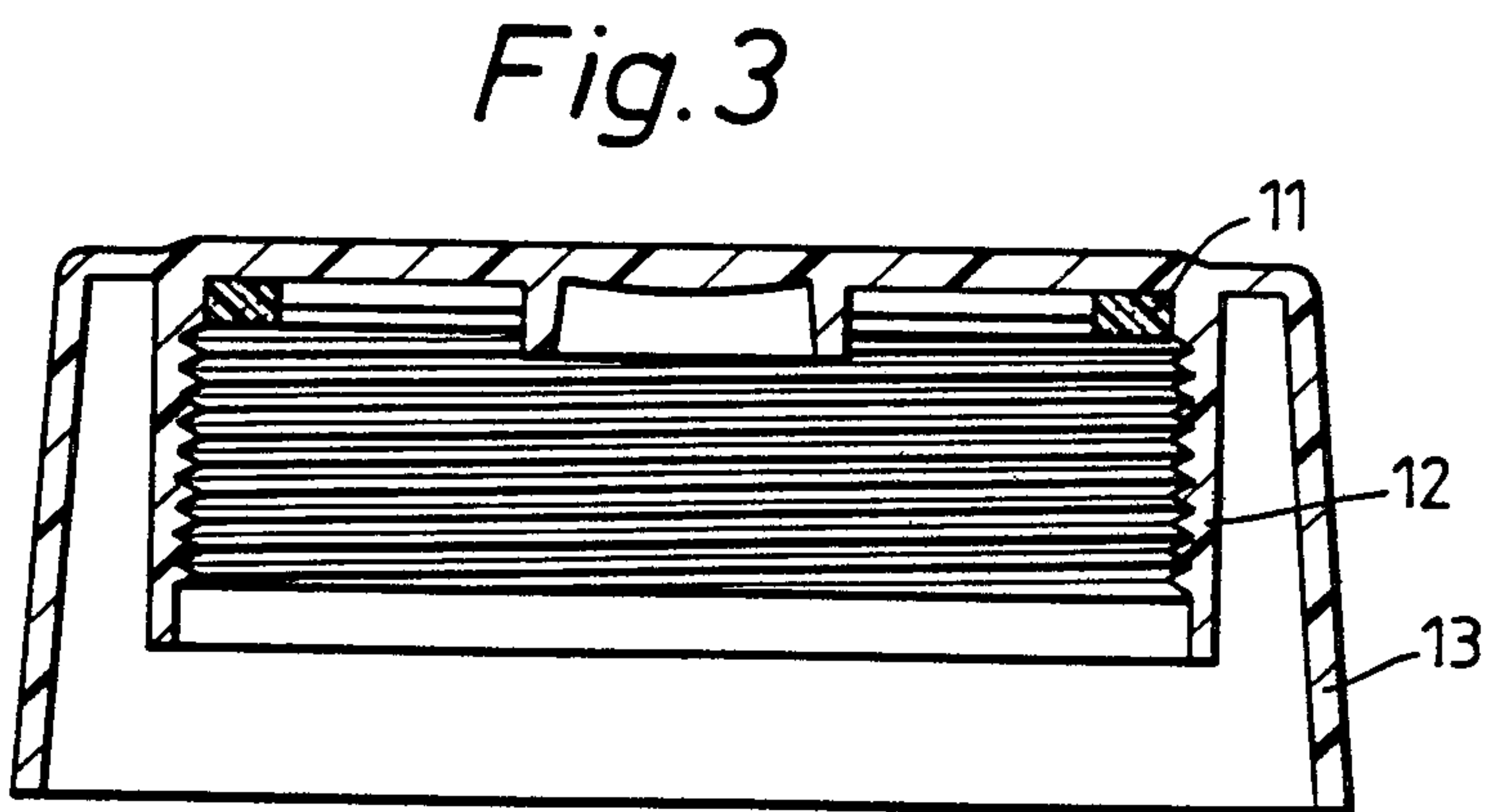


Fig. 3

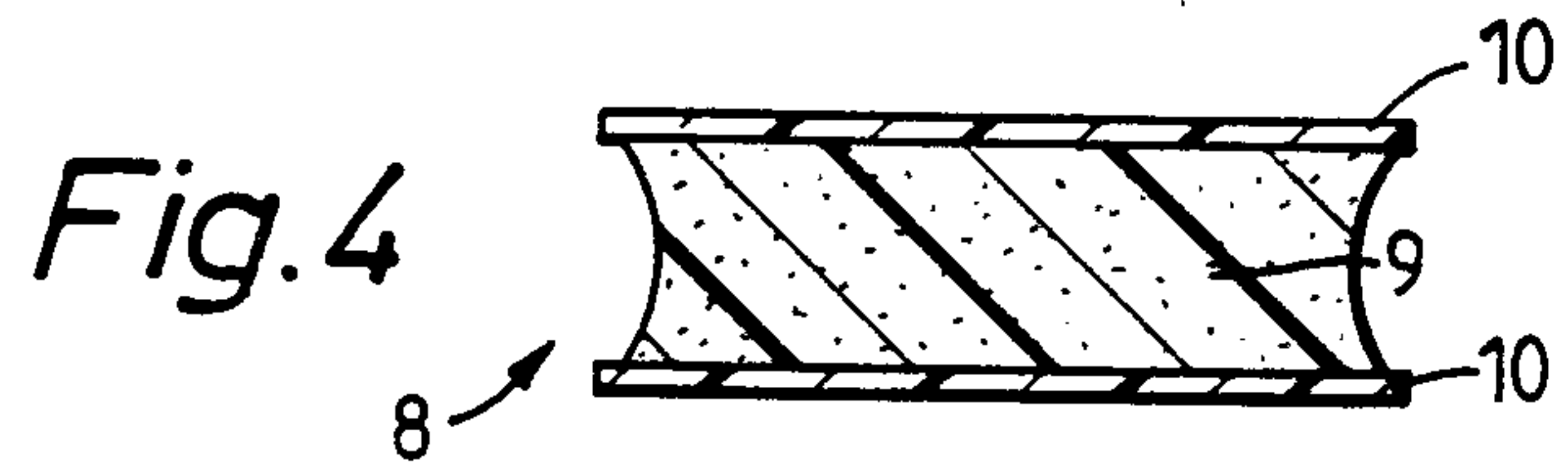
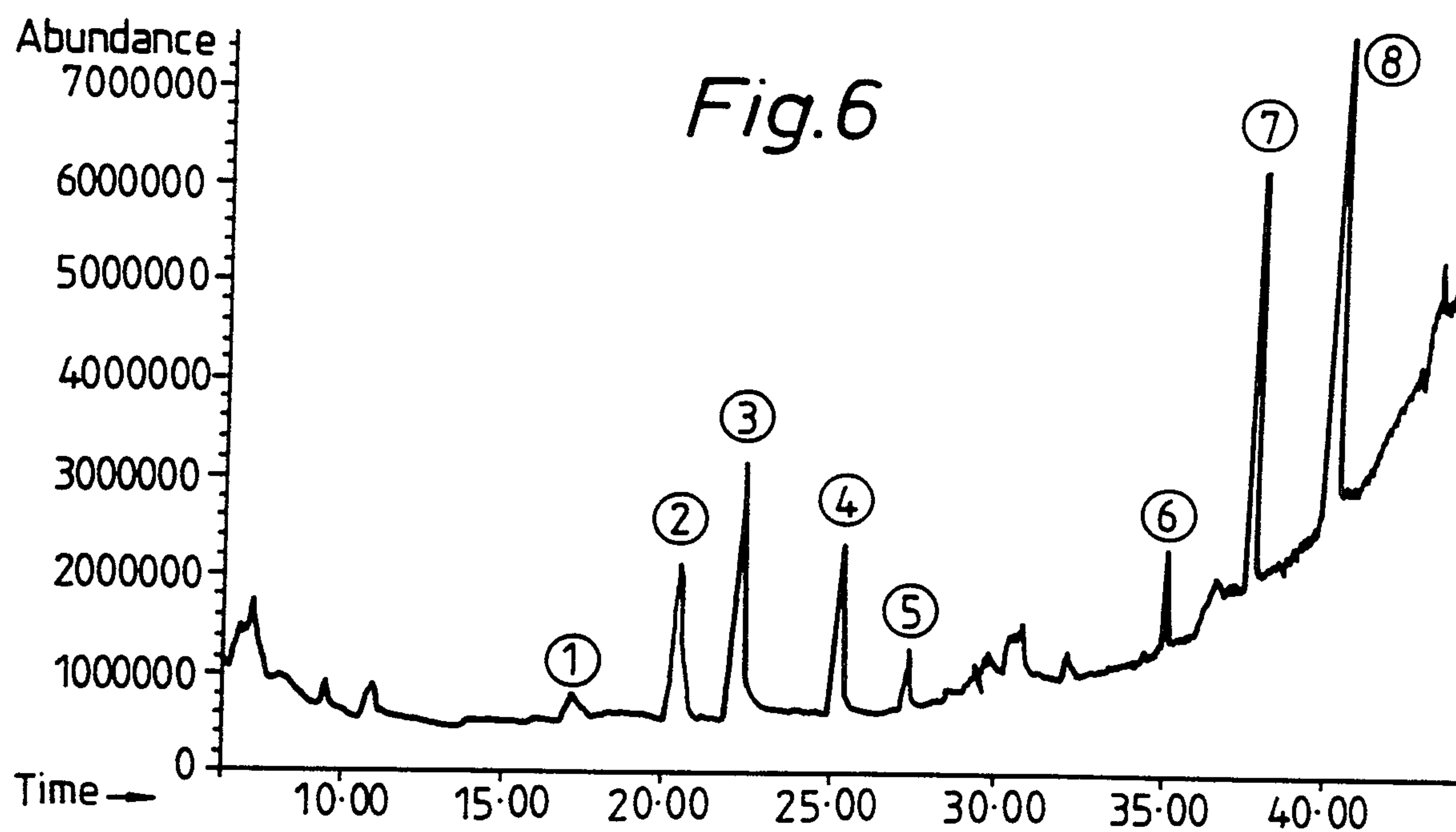
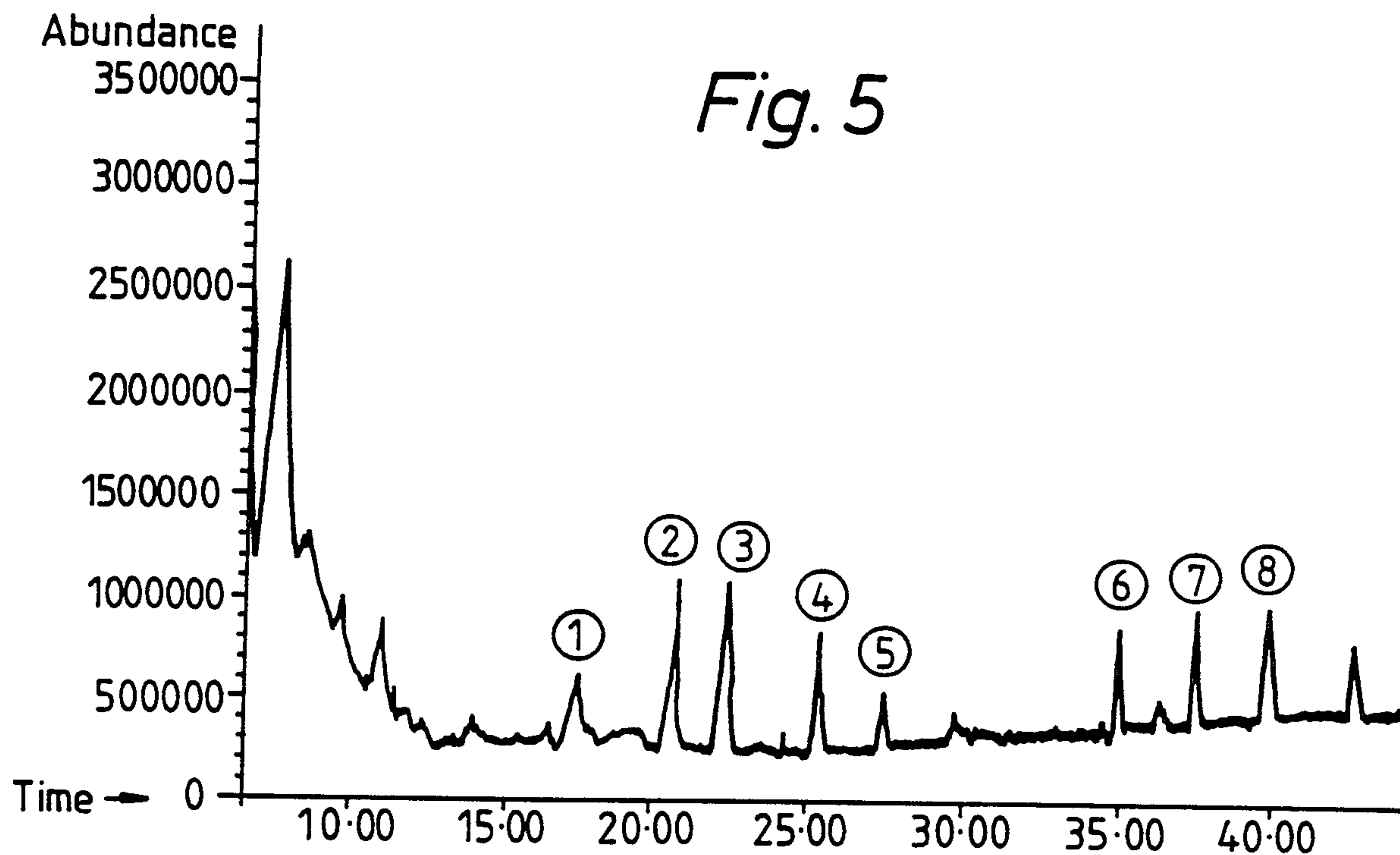


Fig. 4

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