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(54) A container for delivery and/or collection of a liquid.

(57) A container for delivery and/or collection of a fluid, in particular a liquid. The container comprises an observation marking (9) which is adapted so as to show up in accordance with variations in the fluid level (10) in the container (1) for rapid indication of the quantity of fluid present at any given instant of observation.

The observation marking (9) preferably comprises a first pattern (4) arranged on one side (3) of the container and a second pattern (6) arranged on the other side (7) of the container, the said first and second patterns being adapted so that by combined action with one another they give rise to a third clearly discernible pattern (9) in a direction of observation from the said other side (7) of the container on observation levels above the liquid level (10) in the container.

The container (1) is manufactured appropriately from a flexible material, for example plastics, in the shape of a bag with at least one inlet (2) communicating with the interior of the bag. As a result of this the material properties of the bag can be utilized for a clearer showing up of the third pattern (9), since the two sides (6, 7) of the bag will be sucked towards each other owing to the vacuum which is produced in the empty space above the falling liquid level (10).

A reading scale (14) adapted to the quantity of enclosed liquid may be arranged, for example, in association with the observation marking (9), so that the observation marking can be made use of also as a means for facilitating the accurate reading of this scale in that the observation marking clearly indicates the intersection between the liquid level (10) and the reading scale (14).

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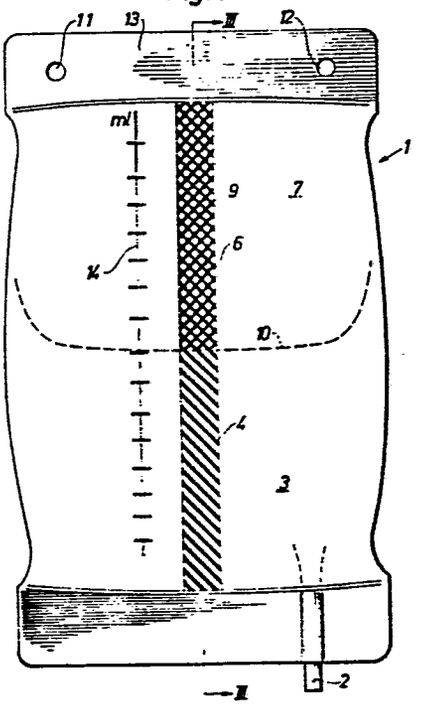
Fig. 1



TITLE

A CONTAINER FOR DELIVERY AND/OR COLLECTION OF A LIQUID

TECHNICAL FIELD

The present invention relates to a container for delivery and/or collection of a fluid, in particular a liquid.

BACKGROUND ART

Under conditions where a container is used, for example for the delivery of a liquid, it may be desirable or even necessary rapidly to obtain an indication of the quantity of liquid which at a given instant still remains in the container in order to make preparations for a possible replacement of the container or for topping it up with liquid before the container becomes completely empty. This may be particularly desirable for example in a hospital where often several patients may be lying at the same time attached to such containers, so that the prescribed supply of sometimes vital liquid to the patients can be maintained without break.

Similar needs occur also in other connections, for example in conjunction with analyses or measurements where such a container may be used for the supply of the required reagent solution.

In known containers for delivery and/or collection of a liquid the only way of obtaining knowledge of the quantity of liquid remaining in the container at a given instant frequently consists in the direct observation of the liquid level in the container.

One disadvantage of such known containers, in particular transparent plastic bags intended to contain or containing essentially colourless liquids, is that it is often very difficult to discern the liquid level in the container other than at very close range. This renders particularly complicated and time-consuming therefore any superintending in cases where a number of such containers are to be observed simultaneously, for example in a hospital, as mentioned above.

It is an object of the present invention, therefore, to provide a container of the above-mentioned type where the liquid level present can be indicated rapidly and simply, regardless of whether

the container is made of transparent material and contains clear or colourless liquid.

This object is achieved in accordance with the invention by a container comprising an observation marking which is especially adapted so as to show up clearly in accordance with variations in the level of the fluid present in the container for a rapid indication of the quantity of fluid present at a given instant of observation.

DISCLOSURE OF INVENTION

In accordance with the invention a container is provided for delivery and/or collection of a fluid, in particular a liquid. The container is characterized in that it comprises an observation marking which is especially adapted so as to show up clearly in accordance with variations in the level of the fluid present in the container, for a rapid indication of the quantity of fluid present at a given instant of observation.

A simple observation marking on the container in accordance with the invention is achieved by a first pattern arranged on the back of the container, that is to say on the container side remote from the observer, so that it becomes readily discernible from the front of the container in time with the falling of the liquid level in the container.

Analogously it is of course so that the same pattern disappears in the direction of observation in time with the rising of the liquid level, as the container is used for example for the collection of a liquid.

Such a first pattern on the back of the container can be particularly suitable in cases where the container is intended to contain or does contain a clear or substantially colourless liquid, whose optical refractive properties are such that this pattern is almost invisible from the front of the container on observation levels below the liquid level in the container, whilst showing up clearly on levels above this liquid level.

In a preferred embodiment a second pattern is also provided on the front of the container in a straight line in front of the said

first pattern on the back of the container, these two patterns being adapted so that by combined action with one another they provide a third clearly discernible pattern on observation levels above the liquid level in the container.

In accordance with a practical embodiment the said first pattern may consist, for example, of a vertical bar marking comprising for example transverse bars which show up or disappear respectively in the direction of observation from the front of the container in time with the falling or rising respectively of the liquid level in the container. At each instant of observation the liquid level is thus indicated by the point of the bar marking where the same changes from being discernible (above the liquid level) to becoming invisible (below the liquid level). Alternatively this bar marking may be printed or stamped onto a separate narrow strip which is cemented or attached in some other manner to the back of the container.

In a preferred embodiment the said second pattern may also consist of a similar bar marking printed or stamped onto the front of the container, for example mirror-symmetrically transverse bars in respect of the bar marking on the back of the container, these two patterns together giving rise to a diamond pattern showing up in the direction of observation which can be observed easily even at a great distance from the container. The lastmentioned bar marking too may be printed onto a separate narrow strip which is cemented or attached in some other manner in a straight line in front of the strip on the back of the container.

In accordance with a second practical embodiment of the invention the said first pattern may consist of a narrow strip with broad horizontal bars spaced equidistantly, the said second pattern on the front of the container in this case preferably consisting of similar strip onto which are printed horizontal bars similarly spaced equidistantly which is vertically displaced in relation to the strip on the back of the container so that the third pattern appears as a continuous line in the direction of observation. In this example the liquid level is thus indicated by the point on the container where the continuous line changes into a broken line below

the liquid level.

In accordance with a specially preferred embodiment the container in accordance with the invention is manufactured from a flexible material, for example plastics, as a result of which the material properties of the container may be utilized for the making evident of the observation marking. If for example the container is filled with liquid and used for delivery through an outlet provided in the container bottom, the front and the back of the container will thus be sucked towards each other owing to the vacuum which is produced in the container above the falling liquid level. In consequence the first and the second pattern will be pressed close to one another, so that the third pattern will show up even more clearly. Even in the event of the observation marking comprising only a first pattern arranged on the back of the container, this pattern will appear more clearly owing to the back and the front of the container being sucked towards one another above the falling liquid level, since any optical refractive phenomena will thereby be minimized.

The observation marking on the container in accordance with the invention is arranged preferably to show up in association with a reading scale provided on the container adapted to the quantity of liquid present. This has the advantage, among other things, that the said observation marking may be utilized as a means for facilitating the accurate reading on this scale, since the observation marking clearly indicates the intersection between the liquid level and the reading scale.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be described in the following in more detail with reference to the enclosed drawings, wherein

fig. 1 is a schematic view of a preferred container according to the invention,

fig. 2a-2c show examples of practical embodiments of an observation marking on the bag according to the invention, and

fig. 3 is a section along line III-III in fig. 1 for a schematic illustration of the function of the container shown in fig. 1.

BEST MODE OF CARRYING OUT THE INVENTION

As can be seen in fig. 1 and fig. 3, the container in accordance with the invention is manufactured preferably from a flexible material, for example plastics, in the shape of a bag provided with at least one inlet 2 communicating with the interior of the bag. In the embodiment shown the bag 1 comprises a bar coding 4 in the form of transverse bars along a substantially vertical zone of the bag arranged on the one side 3 of the bag (corresponding to the side remote from the observer in connection with the use of the bag).

The bar marking 4 is preferably produced in connection with the manufacture of the bag by means of pattern printing or similar stamping directly onto the side 3 of the bag. Alternatively the bar marking 4 may be arranged on a separate narrow strip 5 (fig. 2a) which subsequently is cemented or attached in some other manner to the bag.

As indicated in fig. 1, the bag 1 preferably also comprises a similar bar marking 6 arranged on the other side 7 of the bag in the form of mirror-symmetrically transverse lines in respect of the lines of the bar marking 4 on the said one side 3 of the bag. These mirror-symmetrically transverse lines too may be produced in connection with the manufacture of the bag by pattern printing or similar stamping directly onto the other side 7 of the bag or they may be provided on a separate narrow strip 8 (fig. 2a) which subsequently is cemented or attached in some other manner onto the said other side 7 in a straight line in front of the bar marking on the said one side 3 of the bag.

By the combined action of these two bar markings 4 and 6 a clear diamond pattern 9 is produced on observation levels above the liquid level indicated by a broken line 10 in fig. 1 in time with the falling of the liquid level 10 as liquid is discharged through the outlet 2. The diamond pattern 9 shows up particularly clearly owing to the two sides 3 and 7 of the bag being pressed close to one another above the liquid level 10 because of the vacuum which is produced in the empty space above the falling liquid level 10.

As made evident in fig. 1, the bag 1 may also comprise holes 11 and 12 arranged in the sealing zone 13 on top of the bag 1 for

the suspension of the bag on corresponding suspension hooks (not shown) in connection with the use of the bag.

As can be seen in fig. 2a the bar marking 4 may be provided on a separate narrow strip 5, whilst the bar marking 6 may be provided on a corresponding separate narrow strip 8 to be attached to the two sides 3 and 7 respectively of the bag, as indicated in fig. 1.

In the example shown in fig. 2b the bar marking 4a may comprise a narrow strip 5a patterned with broad horizontal bars spaced equidistantly to be attached to the one side 3 of the bag. In a corresponding manner the bar marking 6a may be provided on a similar strip 8a printed with broad horizontal bars similarly spaced equidistantly to be attached to the other side 7 of the bag. In this case the two strips 5a and 8a are vertically displaced in relation to one another so that a third pattern 9a (at the bottom in fig. 2b) appears in the form of a continuous line in the direction of observation on levels above the liquid level in the container indicated by the broken horizontal line 10a. In this example the liquid level 10 is thus indicated by the points on the container where the continuous line 9a changes into a broken line below the liquid level.

In fig. 2c is shown a further example of an observation marking in accordance with the invention. In this example the observation marking only comprises one of the strips 5a and 8a shown in fig. 2b, for example the strip 4b with broad horizontal bars spaced equidistantly. The pattern 9b appearing above the liquid level 10b, indicated by a broken line in fig. 2c, in this example corresponds to the broad horizontal continuous lines on the strip 5b. In this example the liquid level 10b is indicated by the point on the strip 5b where the pattern 9b ceases to be visible in the direction of observation below the liquid level 10b.

As shown in fig. 1, the bag 1 preferably comprises a reading scale 14 adapted to the quantity of liquid present. The reading scale 14 is arranged in association with the observation marking 9, so that the observation marking clearly indicates the intersection between the liquid level 10 and the reading scale 14 in order to

facilitate the accurate reading of the amount of liquid in the bag 1.

INDUSTRIAL APPLICABILITY

The container in accordance with the invention is intended for delivery and/or collection of a fluid, in particular a liquid under conditions where it may be desirable to obtain a rapid indication of the quantity of liquid which at a given instant still remains in the container.

The container is applicable especially in connection with medical treatment, for example the supply of liquid to a patient who is connected to the container, where it is often necessary to obtain in good time an indication as to how much liquid still remains in the container at a given instant in order to make preparations for a possible replacement of the container or for topping it up with more liquid before the container becomes completely empty.

The container may also be used in other connections, for example in conjunction with analyses or measurements where such a container may be used for the supply of the required reagent solution.

CLAIMS

1. A container for delivery and/or collection of a fluid, in particular a liquid, c h a r a c t e r i z e d in that the container (1) comprises an observation marking (9; 9a; 9b) which is adapted so as to show up clearly in accordance with variations in the level (10; 10a; 10b) of the fluid present in the container, for the rapid indication of the quantity of fluid present at any given instant of observation.

2. A container in accordance with claim 1, c h a r a c t e r i z e d in that the said observation marking (9; 9a; 9b) comprises a first pattern (4; 4a; 4b) arranged on the one side (3) of the container which is adapted so as to show up in a direction of observation from the other side (7) of the container on observation levels above the fluid level (10; 10a; 10b) in the container.

3. A container in accordance with claim 2, c h a r a c t e r i z e d in that the said first pattern (4; 4a; 4b) is printed or stamped in some other manner onto a narrow strip (5; 5a; 5b) which is attached to the said one side (3) of the container.

4. A container in accordance with claim 2 or 3, c h a r a c t e r i z e d in that the observation marking (9; 9a) comprises a second pattern (6; 6a) arranged on the other side (7) of the container, the said first and second pattern (4; 4a and 6; 6a respectively) being adapted so as to provide by combined action with one another a third clearly discernible pattern (9; 9a) on observation levels above the fluid level (10; 10a) in the container.

5. A container in accordance with claim 4, c h a r a c t e r i z e d in that the said second pattern (6; 6a) is printed or stamped in some other manner onto a narrow strip (8; 8a) which is attached to the said other side (7) of the container in a straight line in front of the said first pattern (4; 4a).

6. A container in accordance with anyone of the preceding claims, c h a r a c t e r i z e d in that the container (1) is manufactured from a flexible material, for example plastics, in the form of a bag provided with at least one inlet (2) communicating with the interior of the bag.

7. A container in accordance with claim 6, c h a r a c - t e r i z e d in that the said observation marking (9; 9a; 9b) is arranged in association with a reading scale (14) arranged on the said other side (7) of the container adapted to the quantity of fluid present in the container.

8. A container in accordance with claim 7, c h a r a c - t e r i z e d in that the container (1) comprises holes (11, 12) arranged in sealing zone (13) on top of the container for the suspension of the container on corresponding suspension hooks.

9. A container in accordance with claim 8, c h a r a c - t e r i z e d in that the said inlet (2) is arranged in a corresponding sealing zone at the bottom of the container for delivery of fluid.

10. A container in accordance with claim 8, c h a r a c - t e r i z e d in that the said inlet (2) is arranged in the sealing zone (13) at the top of the container for collection of fluid.

Fig. 1

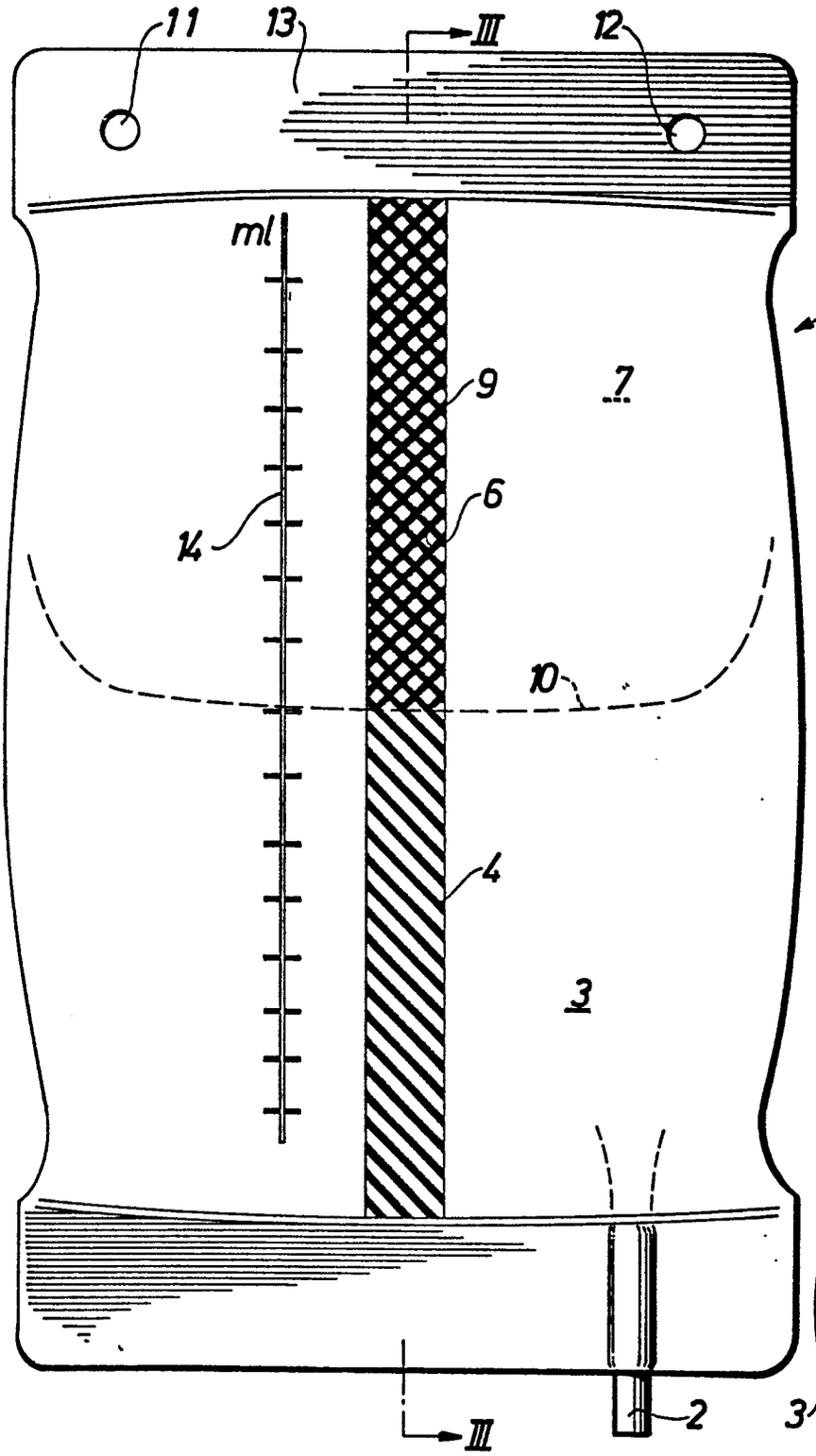


Fig. 3

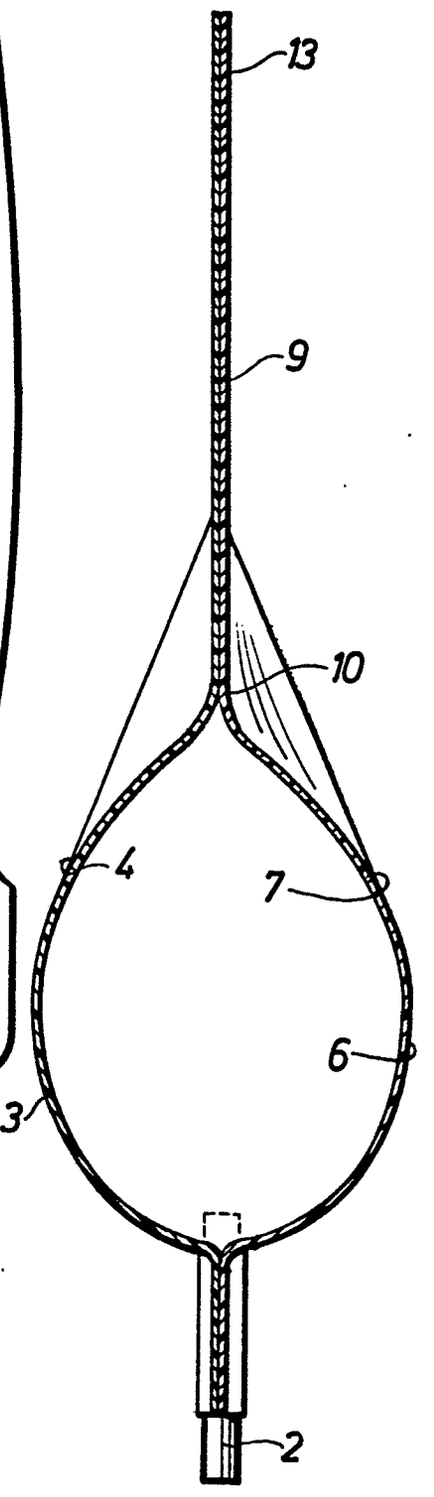


Fig.2A

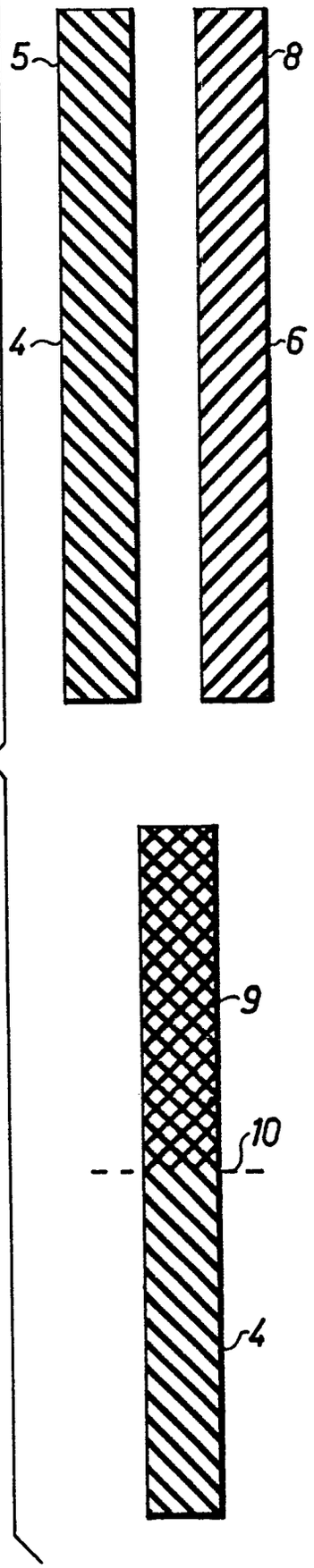


Fig.2B

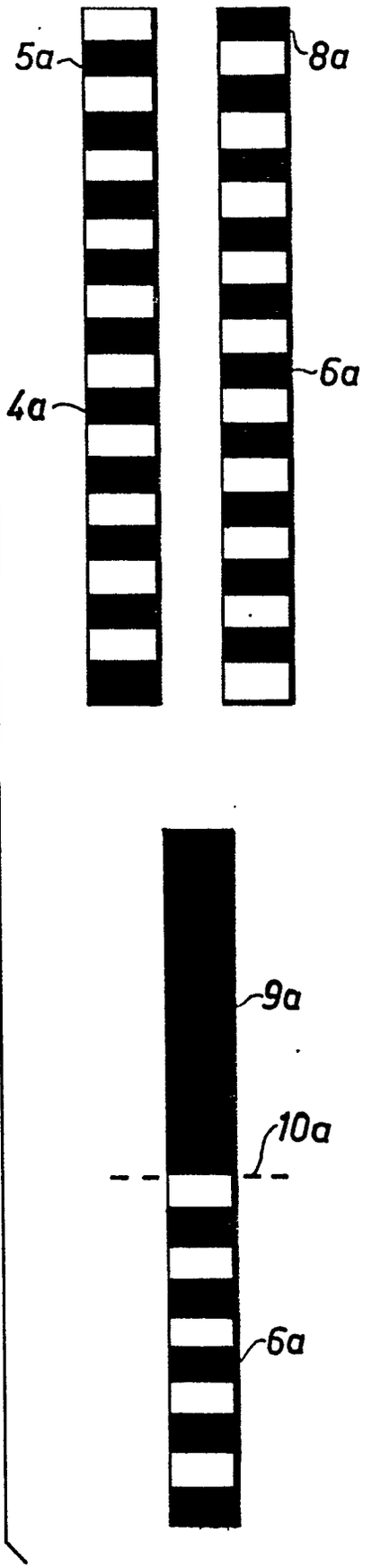


Fig.2C