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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A45C 11/04, B65D 25/10

A1

(11) International Publication Number: WO 93/00027

(43) International Publication Date: 7 January 1993 (07.01.93)

(21) International Application Number: PCT/NL92/00107

(22) International Filing Date: 18 June 1992 (18.06.92)

(30) Priority data:
9101083 24 June 1991 (24.06.91) NL

(71) Applicant *(for all designated States except US):* PROCORNEA HOLDING B.V. [NL/NL]; Kollergang 9, NL-6961 LZ Eerbeek (NL).

(72) Inventor; and
(75) Inventor/Applicant *(for US only) :* WANDERS, Bernardus, Franciscus, Maria [NL/NL]; Villa Bertha 12, NL-6986 AH Angerlo (NL).

(74) Agent: SEERDEN, A., M.; Octrooibureau Vriesendorp & Gaade, P.O. Box 266, NL-2501 AW The Hague (NL).

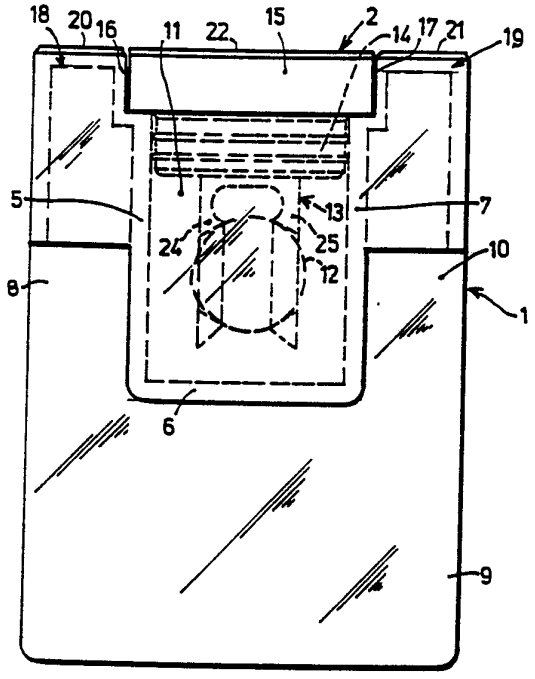
(81) Designated States: AT, AU, BB, BG, BR, CA, CH, CS, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, PL, RO, RU, SD, SE, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
In English translation (filed in Dutch).

(54) Title: CONTAINER FOR STORING AT LEAST ONE CONTACT LENS

(57) Abstract

A container for storing at least one contact lens (12) comprises at least one receiving means (1), one sidewall of which is provided with an opening providing access to a receiving space (11) within the receiving means the contact lens is to be received in, a closing means (2) for closing the opening, and a supporting means (13) being integral with said closing means and serving to support the contact lens. The receiving means (1) comprises two at least substantially flat wall parts (3, 4) and wall joint parts (5, 6, 7) joining said wall parts, while a space defined by said wall parts constitutes the receiving space. Additionally, a contact lens storage apparatus designed for storing a plurality of containers according to the invention is provided.



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Container for storing at least one contact lens

The invention relates to a container for storing at least one contact lens, comprising at least one receiving means, one side wall of which is provided with an opening providing access to a receiving space within the receiving means the contact lens is to be received in, a closing means for closing the opening, and a supporting means being integral with said closing means and serving to support the contact lens.

The receiving means of a state-of-the-art container for storing contact lenses comprises a cylindrical body that is closed at one end and open at the other end, where, that is on the periphery of the cylinder barrel, it is provided with helical thread to mate with internal helical thread arranged in a helical cap for closing the cylindrical receiving means. From the cap a supporting means for supporting the contact lens projects into the receiving means. The receiving means may be of a transparent design and is suitable for containing a conditioning solution.

This state-of-the-art apparatus has a number of drawbacks. It is of considerable dimensions due to the diameter of the cylindrical receiving means being defined by the dimensions of the contact lens and the related support means, which is, for example, particularly disadvantageous when forwarding a plurality of these containers, e.g. from the place of manufacture to customers, such as opticians, training institutes, hospitals, etc., but also in storing relatively large numbers of these containers or during transport of the containers, for example, by customers or contact lens specialists.

Another state-of-the-art container for storing contact lenses also comprises a cylindrical receiving means, yet its cap abuts on the cylindrical receiving means as a snap fastening device, so as to close it. The lens is not supported by a supporting means yet is submerged or floats in the conditioning solution. This presents the problem that when removing the lens from the container a finger tip will contact the conditioning solution, so that the receiving means of the container gets easily soiled.

As for both known types of containers, the receiving means, which is designed to contain a conditioning solution, is to be closed on the periphery by means of the cap abutting on the receiving means. Practice showed that when the lens has to stay for a relatively longer period of time in the container some of the solution evaporates, so that therefore the remaining part of the solution thickens. For this reason, these known containers are not suitable for storing the lens for several days, weeks or months. Besides, it appears that after frequent use leaks may occur, as might take place, for example, when the container is transported in such a manner that the solution is near the opening of the receiving space. Moreover, refraction at the container's cylindrical surface makes it hard to catch any sight of the lens, or, if any, it would be distorted, the visibility being hindered even more when the container is provided with a data-carrying label.

The present invention aims to eliminate the above-described drawbacks, and to this end a container of the type mentioned in the preamble is provided, characterized in that the receiving means comprises two, at least substantially flat wall parts and wall joint parts joining said wall parts, a space

being defined by said wall parts and said wall joint parts constituting the receiving space.

Thanks to such a design the container can be extremely compact, while the geometrical shape is such that also dispatch or storage of a plurality of such containers can be efficient in practice.

Preferably, the wall parts are mutually substantially parallel, the distance between the two wall parts being considerably smaller than an average length covered by each of the wall parts. Thus, on the one hand a receiving space is defined which is related to and closely corresponds to the dimensions of a contact lens, so that a relatively small amount of solution will suffice, while on the other hand the selected design of the container optimizes storage, dispatch, or transport to an even greater extent, particularly in the case of a plurality of containers.

The closing means may comprise an inner part designed to be inserted into the opening, as well as an outer part which is connected to said inner part and which is positioned, in closed position, outside the receiving space. As in this way a portion of the closing means is inserted right into the opening, a proper closure of the container's receiving space can be obtained, while the outer part allows the closing means to be easily removed.

It is preferred that the closing means is made of a resilient material, preferably kraton, and that at least two sealing edges are provided on the periphery of the inner part of the closing means. Thus, the second sealing edge constitutes an additional seal for the receiving means.

It is also preferred that, in a direction at least perpendicular to the wall parts, the outer part of the closing means is of a dimension that is at least virtually equal to the distance between the opposed sides of the wall parts near the outer part of the closing means. As a result, the closing means fits the receiving means perfectly, thus preventing an accidental loosening of the closing means from the receiving means. As part of the safeguard, the receiving means may be provided, at least near the outer part of the closing means, with edge parts which surround the outer part of the closing means, at least partly. Each of these edge parts may include an end face being, in closed position, coplanar with the side of the outer part of the closing means facing away from the receiving space, thus resulting in a perfect alignment.

When considering the invention in detail, it shows that a locking means is provided, comprising securing means for cooperation with related securing means being integral with each of the end faces of the edge parts, so as to lock the closing means in closed position. Moreover, on the side of the outer part of the closing means facing away from the receiving space a recess may be arranged which serves to receive the locking means, at least partly.

According to a preferred embodiment of the apparatus of the invention, one of the wall parts covers a considerably larger surface than the other wall part, while the wall joint parts extend substantially perpendicular to the wall parts. This results in the feature that the one wall part includes a projecting portion extending at least from the wall joint part opposite the closing means, said projecting portion being provided with a data carrier. In this way, the container for

storing a contact lens may be provided with data, such as information as to the contact lens itself, without affecting the good visibility due to the flat wall parts - in the case of a transparent container.

To seal the container a sealing means may be provided which covers at least the closing means and at least one of the two wall parts. As the wall parts are substantially flat, they provide a good bonding surface for the sealing means.

Moreover, the invention provides an apparatus for storing contact lenses which comprises a carrying means comprising two opposed vertical walls as well as wall joint means joining the walls, while recesses are provided on the sides of the walls facing one another, a repeated arrangement of pairs of recesses being suitable for receiving a plurality of containers according to the invention.

This carrying means may be rectangular, especially when it is designed to store contact lenses for a larger period of time, while connecting means may be provided on its periphery so as to connect it to a similar carrying means. This design enables a plurality of containers to be kept in a very efficient and orderly manner, for example, in a chest of drawers.

If the carrying means is used as a unit to which similar carrying means are to be connected, it is preferably torus-shaped, while a cap is provided which may be removably arranged over said carrying means. The torus shape allows on the one hand a plurality of containers according to the invention to be stored efficiently and on the other hand the front wall parts of each container to remain clearly visible, which is

mainly of significant relevance when the latter's projecting portion is provided with a data carrier.

Additional features and merits of the container according to the present invention will be clearly revealed in the following description with reference to the drawing, in which:

figure 1 is a front view of a preferred embodiment of the container for storing contact lenses according to the invention;

figure 2 is a side view of the container according to figure 1;

figure 3 provides a front view as well as a side view of the closing means according to figure 1;

figure 4 is a longitudinal view of a variant embodiment of the container according to figure 1;

figure 5 is a side view of the container according to figure 4;

figure 6 shows a data carrier which is suited to being applied to the container according to figure 1 or 4;

figure 7 shows a sealing means which is suited to being applied to the container according to figure 1 or 4;

figure 8 is a top view of a first embodiment of the apparatus for storing contact lenses according to the invention;

figure 9 is a longitudinal view of the apparatus along line IX-IX of the apparatus according to figure 8;

figure 10 is a, partly cut-away, top view of a second embodiment of the apparatus for storing contact lenses according to the invention; and

figure 11 is a schematic, partly cross-sectional, side view of the apparatus according to figure 10.

Corresponding components are consistently indicated in the figures by identical reference characters.

Figure 1 shows a preferred embodiment of a container according to the invention, which is particularly suitable for storing hard, gas permeable contact lenses. The container comprises a receiving means 1 as well as a closing means in the form of a cap 2. The receiving means 1 comprises two parallel, flat wall parts 3 and 4 (see also figure 2), as well as wall joint parts 5, 6, and 7 joining said wall parts, said wall joint parts extending perpendicular to the wall parts 3 and 4. The wall part 4 covers a considerably larger surface than the wall part 3 due to the projecting parts 8, 9, and 10 extending from their respective wall joint parts 5, 6, and 7. The wall parts 3 and 4 combined with the wall joint parts define a space 11 constituting a receiving space for a contact lens 12. Moreover, the space 11 is suitable for containing a solution, e.g. a conditioning solution. In the receiving space the contact lens 12 is supported by a supporting means 13 being integral with the cap 2 covering said receiving space 11. The cap 2 is represented as a separating part in figure 3.

As figures 1 and 2 show, the distance a between the inner sides of the wall parts 3 and 4 is considerably smaller than the smallest length or width of each of the wall parts 3 and 4, in this case by a factor of four.

The cap 2 comprises an inner part 14 which is designed to be inserted through the opening into the receiving space 11, as well as an outer part 15 which is to remain outside the receiving space 11. The cap is made of a resilient material, such as kraton. The dimension b of the outer part of the cap, that is its thickness as measured in the direction perpendicular to the wall parts 3 and 4 (see figure 5) is equal to the distance between the outer sides of the wall parts 3 and 4. The outer part 15 of the cap 2 is surrounded at its side faces 16 and 17 by edge parts 18 and 19 of the receiving means 1. Edge parts 18 and 19 include end faces 20 and 21 which are coplanar with the outer side 22 of the cap 2, thus the cap 2 being countersunk in the receiving means 1.

The supporting means 13 comprises two legs 24 and 25 provided with conical recesses 22. The supporting means 13 is integral with the closing means 2, and therefore it is made of the same resilient material. The lens 12 can be fitted into the supporting means by spreading the legs 24 and 25 slightly apart. In a similar manner the lens may be removed from the supporting means.

A secure seal of the receiving space is due to the cap 2 which is provided with two sealing edges 26 and 27 on the periphery of the inner part 14.

Figure 4 shows a longitudinal view of a variant embodiment of the apparatus according to figure 1, comprising a locking means including a strip 28 provided with fastening means in the form of pins 29 mating as a snap fastening device with the openings 30 arranged in the end surfaces 20 and 21. In this way, the cap 2 may be locked by the strip 28. Figure 5 shows that in the cap's outer side 22 a recess 31 is provided so as to receive the strip 28.

Figure 6 shows an example of a data carrier 32 being provided at the rear with a self-adhesive material and having dimensions corresponding to those of the projecting parts 8, 9, and 10 of the wall part 4 (see also figure 4). On the data carrier 32, the design of which allows any recognizable colour, data may be printed which reveal the features of the contact lens 12 to be stored.

Figure 7 shows a sealing means 33 which is provided at the rear with an adhesive material just like the data carrier 32 and which has the right dimensions to fit over the cap 2 and each of the wall parts 3 and 4, as is indicated in figure 5 by dashed lines. On the sealing means 33 data concerning the lens, such as diameter, dioptre, asphericality, eccentricity, and prism may be printed, combined with a bar code 34 for the sake of identification. In order to break the sealing in a simple, clearly visible and irreversible manner, the sealing means 33 is provided with microperforations, at least at the section corresponding to the position of the cap 3 which is indicated by a section line 35.

To store a plurality of containers according to the invention, the invention provides a device for storing contact lenses,

two embodiments of which are represented in figures 8 and 9 and figures 10 and 11, respectively.

Figure 8 shows an elongated supporting means 40 comprising two opposed vertical walls 42 and 43 as well as wall joint means 44. On the opposed sides 45 and 46 of the walls 42 and 43 slots 47 are provided in such a manner that a pair of opposed slots is suitable for receiving a container according to the invention at its projecting parts 8, 9, and 10, as is indicated by the chain lines in figures 8 and 9.

On the periphery of the carrying means 40 a connecting means 48, 49 is provided, so as to connect it to a similar carrying means.

Preferably, the outside dimensions of the carrying means 40 are selected so as to meet the DIN-requirements for desk drawers, thus making the carrying means 40 particularly suitable for a durable storage of contact lenses.

Figure 10 shows a second embodiment of the apparatus for storing contact lenses, comprising a carrying means 50 which is torus-shaped and which can be covered by a tailor-made, removable cap 51. In the centre a plate-shaped part 52 is provided which serves as an occasional place for the removed caps 2 when trying a contact lens that fits the eye.

It will be obvious to those skilled in the art that several alternatives to the above-described embodiments are feasible within the scope of the invention. The container may, for example, also be provided with two receiving means for storing a pair of contact lenses.

C L A I M S

1. Container for storing at least one contact lens, comprising at least one receiving means (1), one side wall of which is provided with an opening providing access to a receiving space (11) within the receiving means the contact lens is to be received in, a closing means (2) for closing the opening, and a supporting means (13) being integral with said closing means and serving to support the contact lens (12), **characterized in that** the receiving means comprises two, at least substantially flat wall parts (3, 4) and wall joint parts (5, 6, 7) joining said wall parts, a space defined by said wall parts (3, 4) and said wall joint parts (5, 6, 7) constituting the receiving space.

2. Container according to claim 2, **characterized in that** the wall parts (3, 4) are mutually substantially parallel.

3. Container according to claim 2, **characterized in that** the distance (a) between the two wall parts is considerably smaller than an average length covered by each of the wall parts (3, 4).

4. Container according to any one of claims 1-3, **characterized in that** the closing means (2) comprises an inner part (14) designed to be inserted into the opening and an outer part (15) which is connected to the inner part (14) and is positioned, in closed position, outside the receiving space (11).

5. Container according to claim 4, **characterized in that** in a direction at least perpendicular to the wall parts (3, 4), the outer part (15) of the closing means (2) is of a dimension (b)

being at least virtually equal to the distance between the opposed sides of the wall parts (3, 4) near the outer part (15) of the closing means (2).

6. Container according to either of claim 4 or 5, **characterized in that**, at least near the outer part (15) of the closing means (2), the receiving means (1) is provided with edge parts (18, 19) which at least partly surround the outer part (15) of the closing means (2).

7. Container according to claim 6, **characterized in that** each of the edge parts (18, 19) includes an end face (20, 21), said end faces being coplanar, in closed position, with the side of the outer part of the closing means (2) facing away from the receiving space (11).

8. Container according to claim 7, **characterized in that** a locking means (28) is provided, comprising securing means (29) for co-operation with related securing means being integral with each of the end faces of the edge parts, so as to lock the closing means in closed position.

9. Container according to claim 8, **characterized in that** on the side of the outer part of the closing means facing away from the receiving space a recess (31) is arranged which serves to receive the locking means (28), at least partly.

10. Container according to any one of the preceding claims, **characterized in that** one of the wall parts (4) covers a considerably larger surface than the other wall part (3), the wall joint parts extending substantially perpendicular to the wall parts.

11. Container according to claim 10, **characterized in that** the one wall part (4) includes a projecting portion (8, 9, 10) extending at least from the wall joint part (6) opposite the closing means (2).

12. Container according to claim 11, **characterized in that** the projecting portion is provided with a data carrier (32).

13. Container according to any one of the preceding claims, **characterized in that** a sealing means (33) is provided which covers at least the closing means (2) as well as one of the two wall parts (3, 4).

14. Container according to any one of the preceding claims, **characterized in that** the closing means (2) is made of a resilient material, preferably kraton.

15. Container according to any one of claims 4-14, **characterized in that** at least two sealing edges (26, 27) are provided on the periphery of the inner part (14) of the closing means (2).

16. Apparatus for storing contact lenses, **characterized in that** it comprises a carrying means (40) comprising two opposed vertical walls (42, 43) as well as wall joint means (44) joining the walls, while recesses (47) are provided on the sides of the walls facing one another, a pattern of pairs of recesses being designed for receiving a plurality of containers according to any one of claims 1-15.

17. Apparatus according to claim 16, **characterized in that** the carrying means (40) is rectangular, connecting means (48, 49)

being provided on the periphery of said carrying means, so as to connect it to a similar carrying means.

18. Apparatus according to claim 16, **characterized in that** the carrying means (40) is substantially torus-shaped.

19. Apparatus according to claim 16 or 18, **characterized in that** it comprises a cap (51) being removably arranged over the carrying means (40).

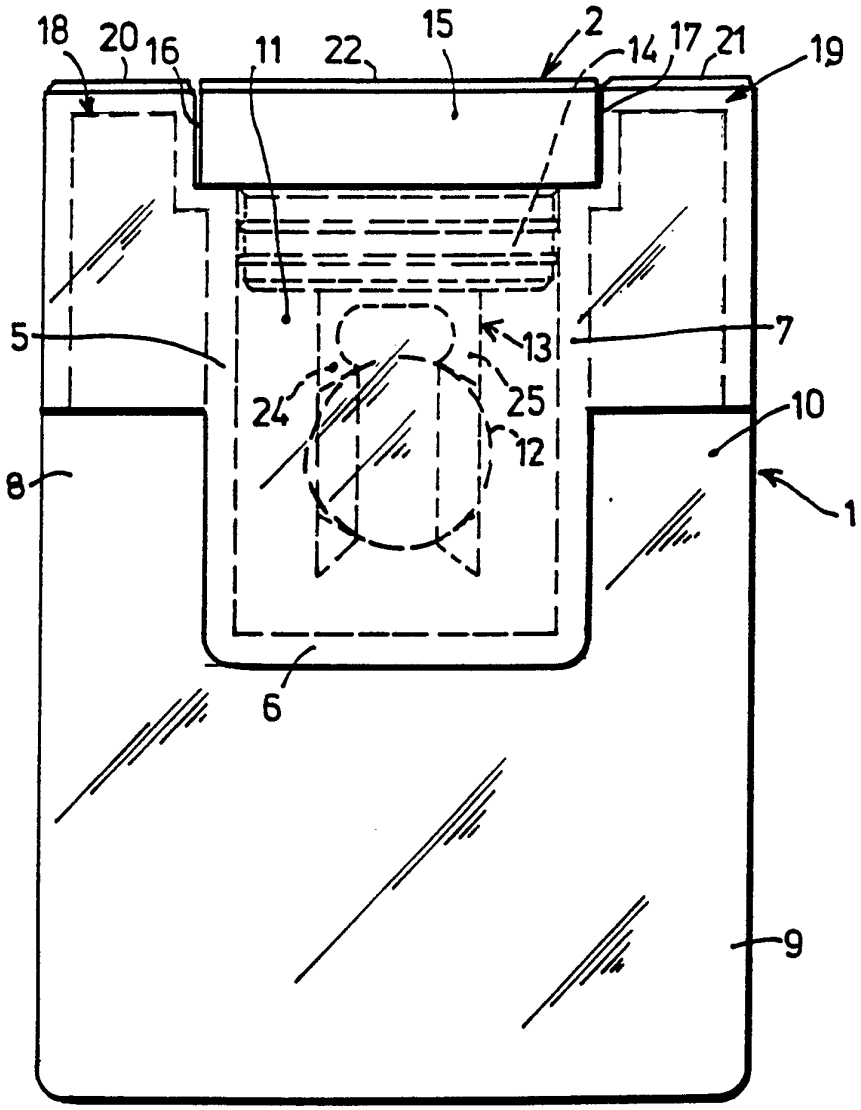


FIG. 1

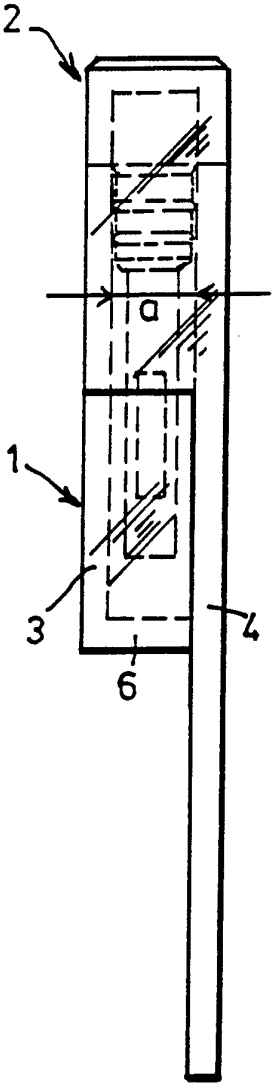
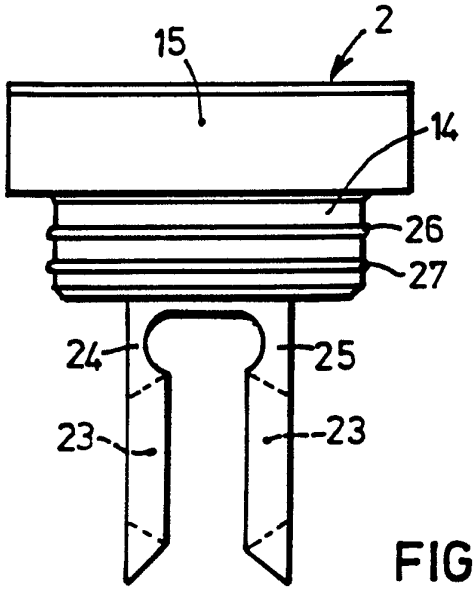


FIG. 2



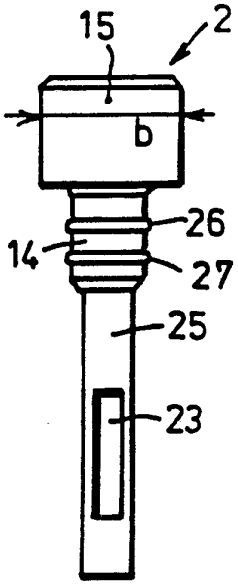


FIG. 3

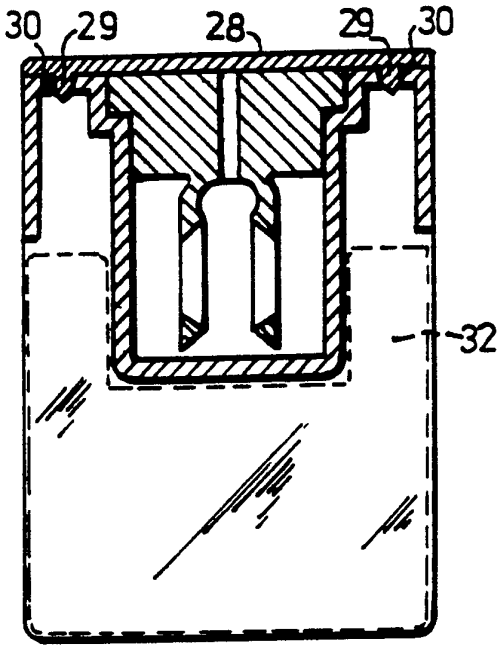


FIG.4

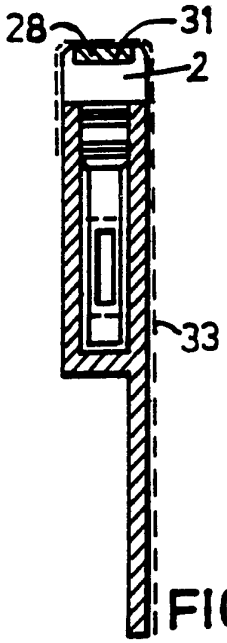


FIG.5

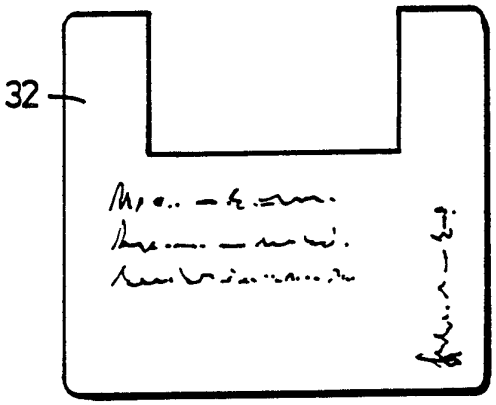


FIG.6

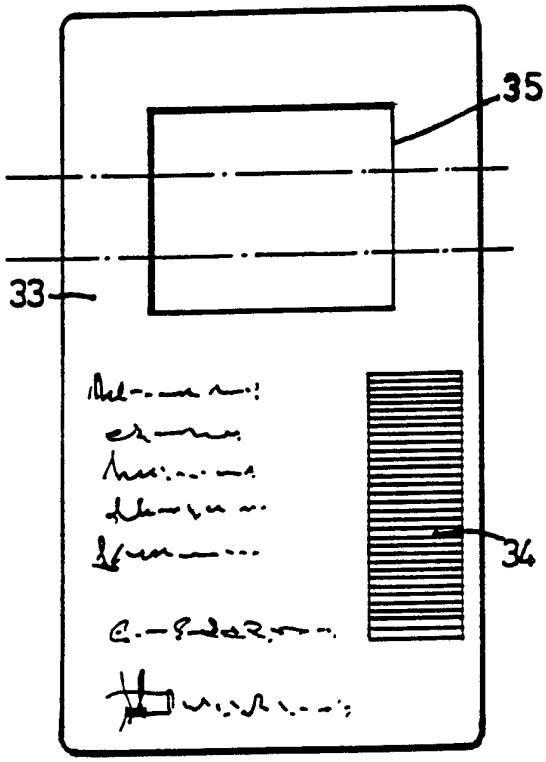


FIG.7

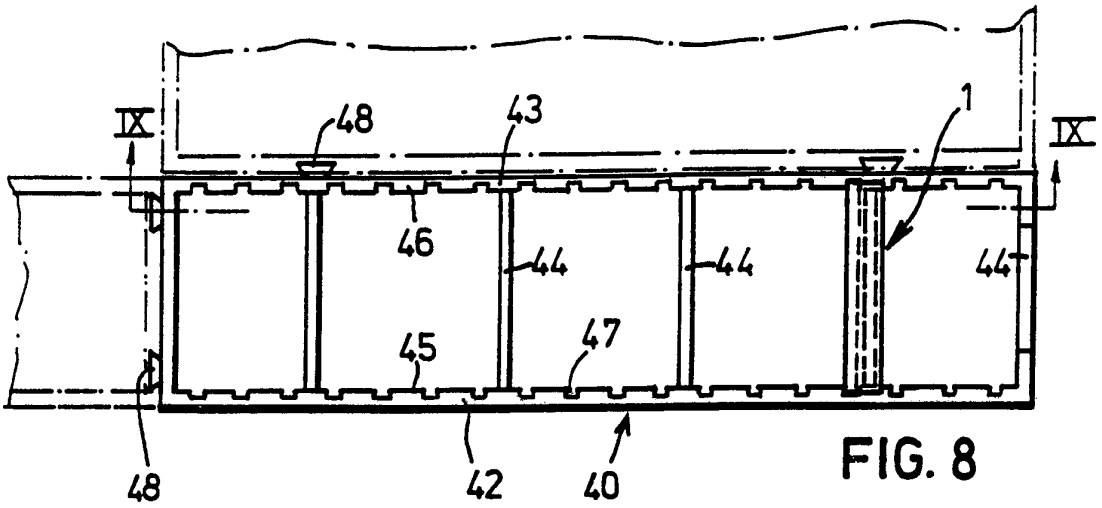


FIG. 8

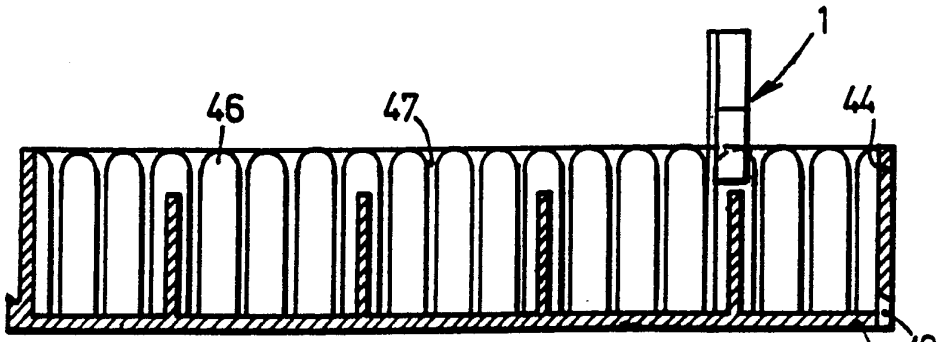


FIG. 9

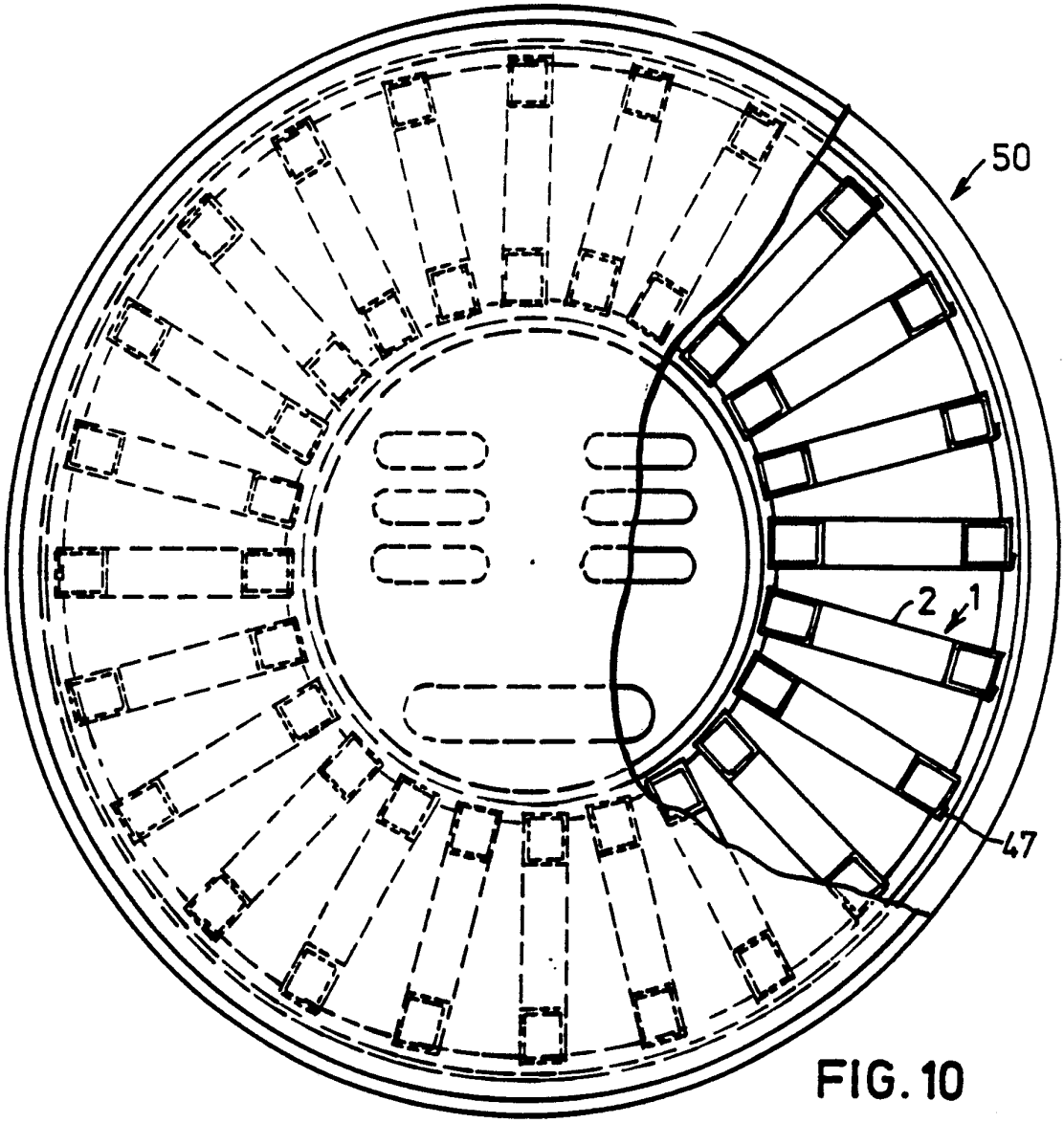


FIG. 10

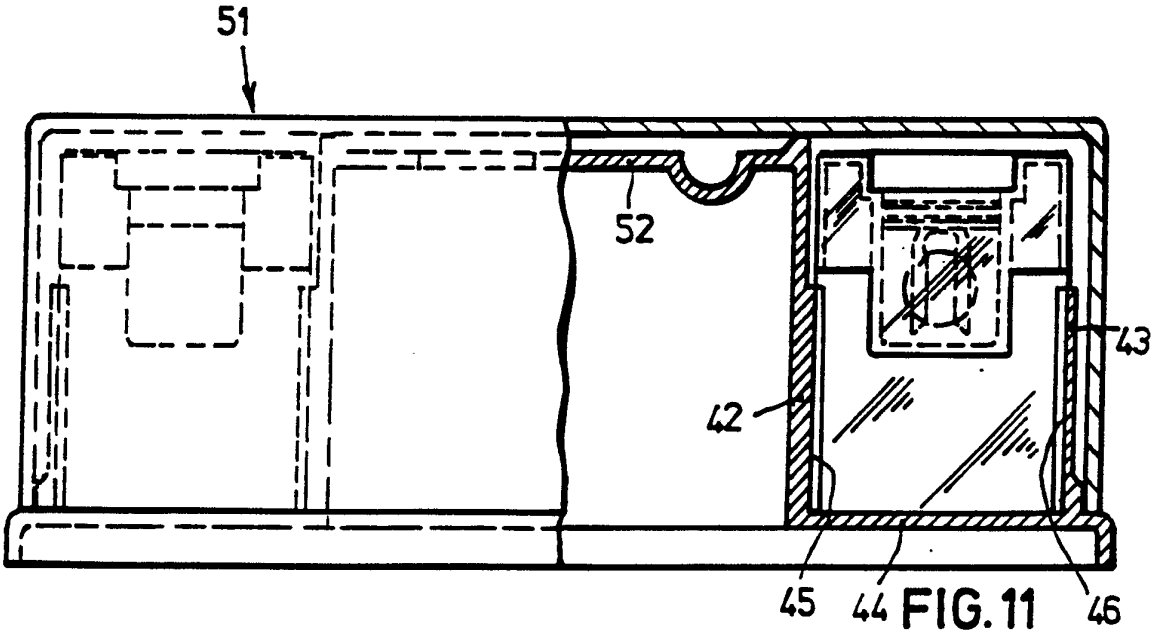


FIG. 11

INTERNATIONAL SEARCH REPORT

PCT/NL 92/00107

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 A45C11/04; B65D25/10

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	A45C ; B65D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X	US,A,3 113 579 (R.M. WILLIS) 10 December 1963 see column 3, line 18 - line 31; figures 1-4	1-6
Y		10-12

X	EP,A,0 351 202 (VISTAKON, INC.) 17 January 1990 see column 5, line 53 - column 6, line 13; figures 5,6	16
Y		17,19

Y	FR,A,2 310 940 (ESSILOR INTERNATIONAL, COMPAGNIE GENERALE D'OPTIQUE) 10 December 1976 see page 7, line 9 - line 20; figures	10-12

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° Special categories of cited documents :[10]

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IV. CERTIFICATION

2

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
16 OCTOBER 1992	26. 10. 92
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	MARANGONI G.

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	US,A,3 880 278 (F.E. BROWN) 29 April 1975 see column 2, line 60 - line 63 see column 3, line 15 - line 24; figures 3,4	14,15
Y	FR,A,2 595 667 (LABORATOIRES SUPPO-STERIL, S.R.L.) 18 September 1987 see abstract; figure 6	17
Y	US,A,3 976 193 (A. DOGLIOTTI) 24 August 1976 see the whole document	19
A	US,A,3 741 377 (N.L. KRELLEN) 26 June 1973 see column 3, line 36 - line 56	16
A	US,A,3 367 481 (K. TANAKA) 6 February 1968	

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. NL 9200107 SA 62650

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 16/10/92
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-3113579		None	
EP-A-0351202	17-01-90	US-A- 4986414	22-01-91
		AU-B- 622919	30-04-92
		AU-A- 3804789	18-01-90
		JP-A- 2142562	31-05-90
FR-A-2310940	10-12-76	None	
US-A-3880278	29-04-75	None	
FR-A-2595667	18-09-87	None	
US-A-3976193	24-08-76	None	
US-A-3741377	26-06-73	None	
US-A-3367481		None	