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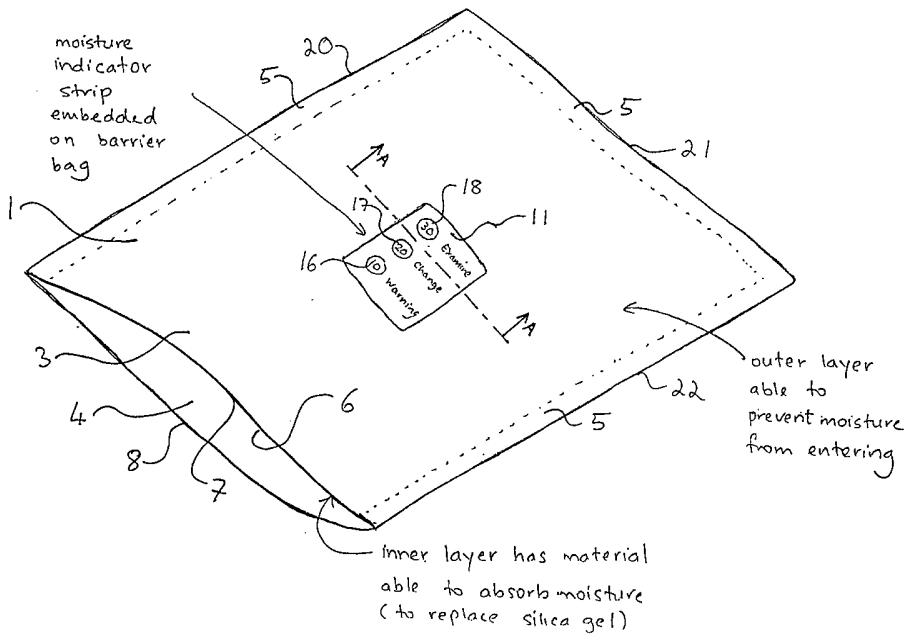
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A BAG



(57) Abstract: A bag (1) has side walls (3, 4) that are substantially impervious to moisture. The bag has an opening (6) at one end that is adapted to be sealed. A portion (11) of a side wall includes a substantially transparent material (12) which is substantially impervious to moisture. A moisture indicating material (13) is mounted within the bag adjacent to the transparent material (12) to enable the moisture indicating material (13) to be viewed through the transparent material, and at least a portion of the moisture indicator material (13) is exposed to air within the bag (1).

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A Bag

The invention relates to a bag, and especially a bag for an electronics device which is substantially impervious to moisture.

Semiconductor devices are conventionally stored and transported in bags that are impervious to moisture. Typically, the bag material includes a metal foil layer which is normally opaque. In addition to the semiconductor device, the bags usually also contain a desiccant to ensure that the air within the bag remains as dry as possible, and a moisture indicator to enable a user to confirm that the moisture within the bag is below a pre-defined level when the bag is opened.

However, one of the problems with this conventional system is that it is necessary to have two additional components (the desiccant and the moisture indicator), which need to be inserted into the bag with the semiconductor device prior to sealing of the bag. In addition, it is not possible to view the moisture indicator without first opening the bag.

In accordance with the present invention, there is provided a bag comprising side walls which are substantially impervious to moisture and having an opening at one end which is adapted to be sealed, a portion of a side wall comprising a substantially transparent material which is substantially impervious to moisture and a moisture indicating material mounted within the bag adjacent to the transparent material to enable the moisture indicating material to be viewed

through the transparent material, and at least a portion of the moisture indicator material being exposed to air within the bag.

Preferably, the side walls of the bag further comprise a desiccant material which defines at least a portion of an inside wall of the bag.

Typically, the desiccant material may be a silica gel.

Preferably, the side walls of the bag comprise a laminated material which may comprise a metal foil.

Preferably, the substantially transparent material may be a transparent moisture barrier film, such as DY3008-NM-792-260 moisture barrier film manufactured by Dou Yee Enterprises (S) Pte Ltd.

Typically, the bag is for containing an electronics device, such as a packaged semiconductor device.

An example of a bag in accordance with the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 shows a bag for a semiconductor device; and

Figure 2 is a cross-sectional view along the line AA in Figure 1.

Figures 1 and 2 show a bag 1. The bag 1 is fabricated from two rectangular sheets 3, 4 of flexible material that are joined together by a weld 5 along three edges 20, 21, 22 so that the each sheet 3, 4 defines a side wall of the bag 1. The sheets 3, 4 each have a respective fourth edge 7, 8 that defines an opening 6 into which a packaged semiconductor device (not shown) may be inserted prior to sealing the opening 6 by sealing together the edges 7, 8, for example by a thermoplastic welding process.

The sheets 3, 4 each include a laminated aluminium foil material 9 on the outside and a layer of a desiccant material 10, such as silica gel, on the inside. Typically, the desiccant material 10 may be located within a porous inner bag 15 that is attached to the inner wall of the foil material 9. The sheet 3 includes a window portion 11 which is formed from a substantially transparent material 12 which is also substantially impervious to moisture. For example, a suitable material may be DY3008-NM-792-260 moisture barrier film produced by Dou Yee Enterprises (S) Pte Ltd. Located adjacent to the transparent material 12 is a moisture indicating material 13, which is located on the inside of the transparent material 12.

In use, a packaged semiconductor device is placed within the bag 1 and the ends 7, 8 of the sheets 3, 4 are sealed together to seal the semiconductor device within the bag 1. The desiccant 10 on the inside of the side walls 3, 4 absorbs any moisture within the bag 1 after it has been sealed. In addition, after the bag has been sealed, a user can view the moisture indicator 13 through the transparent material 12 to ensure that the moisture within the bag 1

is below a predetermined level. As shown in Figure 1, the moisture indicator 13 may comprise three separate moisture level indicators 16, 17, 18. For example, the indicator 16 may be a first warning that the moisture in the bag 1 is approaching a danger level, the indicator 17 may provide an intermediate warning that indicates to a user to put the semiconductor device into a new bag, and the indicator 18 may be provide a warning that the moisture levels have exceeded the recommended maximum level and that the electronic device within the bag should be inspected before use.

CLAIMS

1. A bag comprising side walls which are substantially impervious to moisture and having an opening at one end which is adapted to be sealed, a portion of a side wall comprising a substantially transparent material which is substantially impervious to moisture and a moisture indicating material mounted within the bag adjacent to the transparent material to enable the moisture indicating material to be viewed through the transparent material, and at least a portion of the moisture indicator material being exposed to air within the bag.

2. A bag according to claim 1, wherein a side wall of the bag further comprises a desiccant material which defines at least a portion of an inner surface of the side wall.

3. A bag according to claim 2, wherein the desiccant material comprises a silica gel.

4. A bag according to any of the preceding claims, wherein the side walls of the bag comprise a laminated material.

5. A bag according to claim 4, wherein the laminated material comprises a metal foil.

6. A bag according to any of the preceding claims, wherein the substantially transparent material comprises a transparent moisture barrier film.

7. A bag for an electronics device, the bag being in accordance with any of the preceding claims.

8. A bag for a packaged semiconductor device, the bag being in accordance with any of the preceding claims.

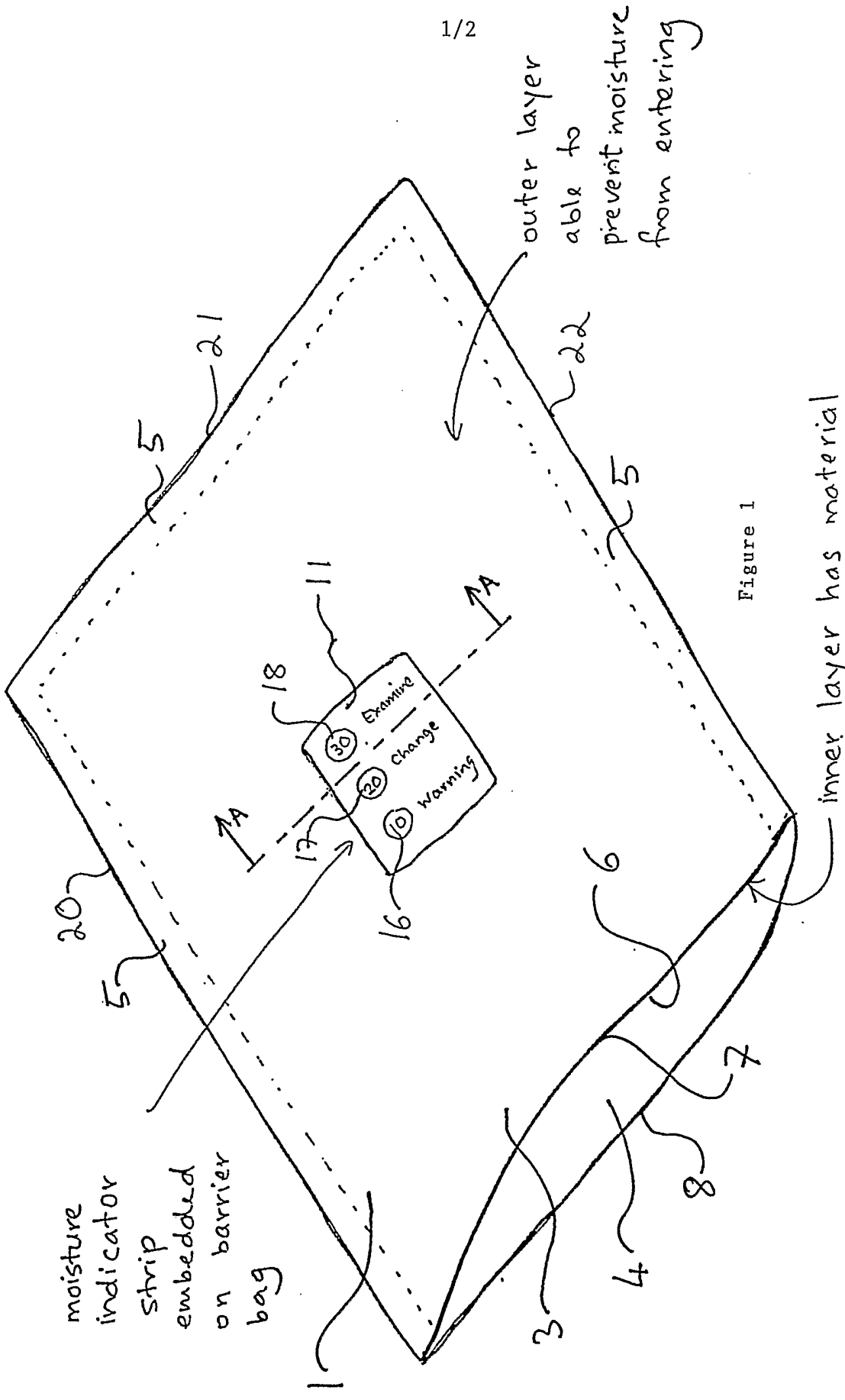
outer layer
able to
prevent moisture
from entering
inner layer has material
able to absorb moisture
(to replace silica gel)
moisture
indicator
strip
embedded
on barrier
bag
Examine
Change
Warning
A
A
1
2
3
4
5
6
7
8
10
11
16
17
18
20
21
22
30

Figure 1

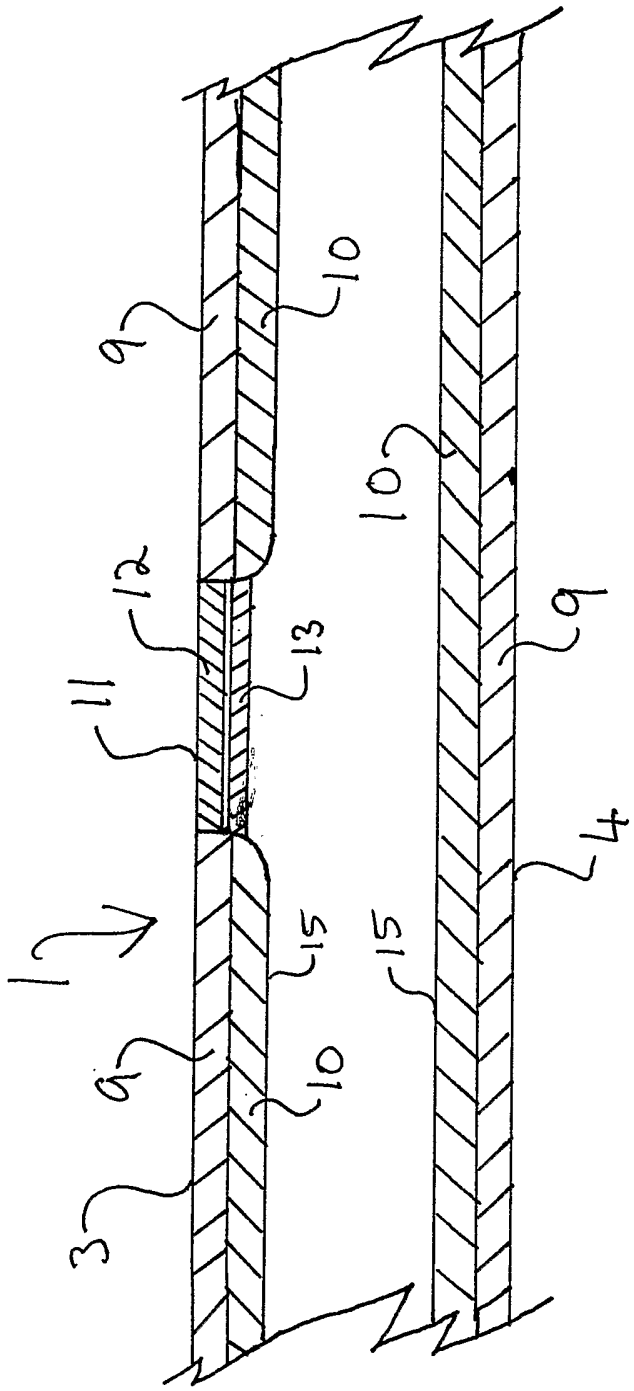

Figure 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG 01/00223

CLASSIFICATION OF SUBJECT MATTER

IPC[7]: B65D 85/90, B65D 81/26, H01L 21/00, H05K 13/00, G01N 13/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC[7]: B65D, G01N, H01L, H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5875892 A (MARTIN) 2 March 1999 (02.03.99) *espec. column 3, line 29.*	1-8
X	US 5293996 A (DUNCAN) 15 March 1994 (15.03.94) *the whole document.*	1,2,4-8
A	US 4971196 A (KITAMURA) 20 November 1990 (20.11.90) *figs. 6,8.*	1,4-8
A	US 5224373 A (WILLIAMS) 6 July 1993 (06.07.93) *the whole document.*	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
„A" document defining the general state of the art which is not considered to be of particular relevance
„E" earlier application or patent but published on or after the international filing date
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„P" document published prior to the international filing date but later than the priority date claimed

„T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
„X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
„Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
„&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 May 2002 (08.05.2002)	10 June 2002 (10.06.2002)
Name and mailing adress of the ISA/AT Austrian Patent Office Kohlmarkt 8-10; A-1014 Vienna Facsimile No. 1/53424/535	Authorized officer MELZER F. Telephone No. 1/53424/355

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/SG 01/00223

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