

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 1 510 490 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:

**02.03.2005 Bulletin 2005/09**

(51) Int Cl.7: **B65H 31/10, B65H 31/36**

(21) Application number: **04255120.0**

(22) Date of filing: **25.08.2004**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**

Designated Extension States:

**AL HR LT LV MK**

(30) Priority: **27.08.2003 US 649146**

(71) Applicant: **Hewlett-Packard Development  
Company, L.P.**

**Houston, TX 77070 (US)**

(72) Inventors:

- **Buibas, Marius  
Chula Vista, CA 91911 (US)**
- **Lee, Ted T.  
San Diego, CA 92131 (US)**
- **Zhang, Erik Y.  
San Marcos, CA 92078 (US)**

(74) Representative: **Jackson, Richard Eric et al**

**Carpmaels & Ransford,  
43-45 Bloomsbury Square  
London WC1A 2RA (GB)**

(54) **Object catch bin**

(57) A system for stacking objects (6) has a tray (4), bias means (12), and conveying means (16). The tray (4) is pivotal about one of its edges (10). The bias means (12) is disposed to resist pivoting of the tray (4) upon conveying of an object into the tray (4).

**EP 1 510 490 A1**

## Description

### FIELD OF THE INVENTION

**[0001]** This invention relates in general to an object catch bin and, more particularly, to an object catch bin that pivots.

### BACKGROUND OF THE INVENTION

**[0002]** Object catch bins are used to stack objects. Often, catch bins are used to catch compact discs after the discs have been printed. In many standard object catch bins, newly printed discs are dropped directly on top of one another. This direct impact may scratch or nick newly printed discs or objects already in the bin. Additionally, the conventional direct impact object catch bin usually leaves the stacked objects or discs in a non-uniform stack.

**[0003]** Other object catch bins attempt to address the shortcomings of the direct impact catch bin through a variety of costly modifications. The upstacker or automated stacker utilizes a robot, which carefully places printed objects or discs on a designated stack after processing. The main drawbacks to this variety of catch bin are that it is very costly and large.

**[0004]** Another type of catch bin rests entirely on springs. Although this type of catch bin may effectively cushion the impact of objects dropping directly on one another, this type of catch bin utilizes a significant amount of space and is expensive to manufacture.

### SUMMARY OF THE INVENTION

**[0005]** According to principles of the present invention, an object catch bin has a tray disposed to catch objects. The tray is pivotal about an edge. Bias means resist pivoting of the tray.

### DESCRIPTION OF THE DRAWINGS

**[0006]** Figures 1-3 are illustrations of one embodiment of the object catch bin of the present invention in operation.

**[0007]** Figure 4 illustrates another embodiment of the object catch bin of the present invention.

**[0008]** Figure 5 is a flow chart illustrating one embodiment of the method for stacking objects of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

**[0009]** Illustrated in Figures 1 through 3 is one embodiment of an object catch bin 2. Object catch bin 2 includes a tray 4. Tray 4 is disposed to catch objects 6. Tray 4 is made of any material and has any shape suitable for holding object 6. Object 6 is any object that is stackable. Examples of object 6 include compact discs,

disc cases, cassettes, and boxes.

**[0010]** Back stop 8 is any structure capable of catching object 6 in tray 4. In one embodiment, back stop 8 is integral with tray 4. In another embodiment, back stop 8 is not integral with tray 4. Back stop 8 is attached to tray 4 in one embodiment and not attached to tray 4 in another embodiment. Optionally, tray 4 rests on a base member 14. Base member 14 can have any shape or configuration suitable for supporting or holding tray 4. In one embodiment, base member 14 is attached to back stop 8. In another embodiment, base member 14 is detached from back stop 8.

**[0011]** Tray 4 has an edge 10. In one embodiment of tray 4, edge 10 is located at the vertex of tray 4 and back stop 8. Tray 4 is pivotal about edge 10 of tray 4.

**[0012]** Bias means 12 is any structure that causes tray 4 to resist pivoting about edge 10 of tray 4. Examples of bias means 12 are springs, hydraulics, and magnetic bias means. In one embodiment, bias means 12 is attached only to tray 4. In another embodiment, bias means 12 is disposed between tray 4 and base member 14.

**[0013]** Conveyor means 16 is any device for projecting objects 6 into tray 4. Examples of conveyor means 16 include conveyor belts, rollers, and slides.

**[0014]** Pivoting of tray 4 about edge 10 of tray 4 serves to cushion the impact of object 6 on tray 4 after object 6 is projected into tray 4 by conveyor means 16. Tray 4 optionally pivots using a hinge. Pivoting of tray 4 also optionally results in rotation of tray 4 to a desired location depending on the weight and contents of tray 4. For example, as illustrated in figures 1 through 3, as the number or weight of objects 6 on tray 4 increase, tray 4 pivots from an angled position (figure 1) to a mostly horizontal position (figure 3) when full.

**[0015]** Figure 4 illustrates pivoting in another embodiment of the configuration of tray 4 and back stop 8. In this embodiment, tray 4 and back stop 8 are attached to each other at edge 10. Both tray 4 and back stop 8 pivot about edge 10 of tray 4. As the number or weight of objects 6 on tray 4 increases, tray 4 pivots from an angled position to a mostly horizontal position and back stop 8 pivots from an angled position to a mostly vertical position. The mostly vertical position of back stop 8 facilitates straight stacking of objects 6.

**[0016]** Figure 5 is a flow chart representing steps of one embodiment of the present invention. Although the steps represented in Figure 5 are presented in a specific order, the present invention encompasses variations in the order of steps. Furthermore, additional steps may be executed between the steps illustrated in Figure 5 without departing from the scope of the present invention.

**[0017]** Object 6 is conveyed 18 into tray 4. Tray 4 catches 20 object 6. Catching 20 includes receiving the object 6 after it is conveyed 18 into the tray 4. Tray 4 pivots 22 about the edge 10 of tray 4. Bias means 12 bias 24 tray 4 to resist pivoting about edge 10 of tray 4.

Optionally, bias means 12 may be selected to resist pivoting regardless of the weight and contents of tray 4. Alternatively, bias means 12 may be selected to modify the degree of resistance based upon the weight and contents of tray 4. Modification of the degree of resistance of the bias means 12 allows tray 4 to pivot 22 to a desired location. For example, bias means 12 allows tray 4 to pivot 22 from angled when empty to horizontal when full.

**[0018]** The foregoing description is only illustrative of the invention. Various alternatives and modifications can be devised by those skilled in the art without departing from the invention. Accordingly, the present invention embraces all such alternatives, modifications, and variances that fall within the scope of the appended claims.

## Claims

1. An object catch bin (2) comprising:

- (a) a back stop (8);
- (b) a tray (4) angularly disposed to the back stop (8), the tray (4) pivotal about the vertex of the tray (4) and the back stop (8); and
- (c) bias means (12) for resisting pivoting of the tray (4).

2. The object catch bin (2) of claim 1 wherein the tray (4) and the back stop (8) are fixed relative to each other.

3. The object catch bin (2) of claim 1 wherein the back stop (8) is pivotal about the vertex of the tray (4) and back stop (8).

4. The object catch bin (2) of claim 1 further comprising a base member (14) for holding the tray (4).

5. The object catch bin (2) of claim 1 further including a hinge attached to the tray (4) for pivoting the tray (4) about the vertex of the tray (4) and the back stop (8).

6. The object catch bin (2) of claim 1 further including conveyor means (16) for projecting an object into the tray (4).

7. A method for stacking objects (6), the method comprising:

- (a) Conveying (18) objects (6);
- (b) catching (20) the objects (6) with a tray (4);
- (c) pivoting (22) the tray (4);
- (d) biasing (24) the tray (4) to resist pivoting.

8. The method of claim 7 wherein biasing (24) the tray

(4) includes springably resisting pivoting.

9. The method of claim 7 wherein biasing (24) the tray (4) includes hydraulically resisting pivoting.

10. The method of claim 7 wherein biasing (24) the tray (4) includes magnetically resisting pivoting.

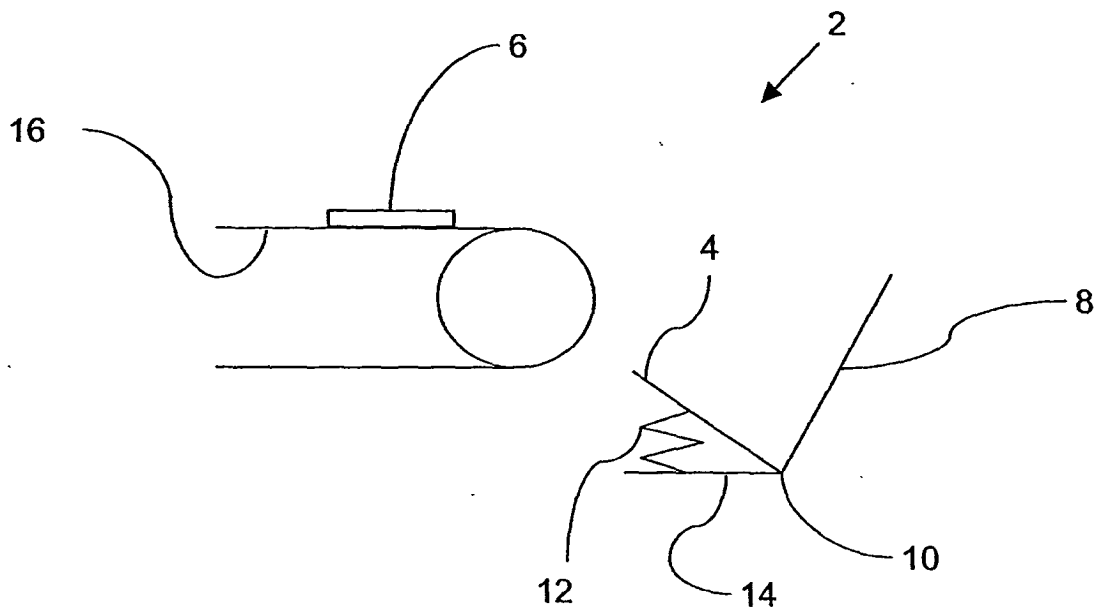


FIG. 1

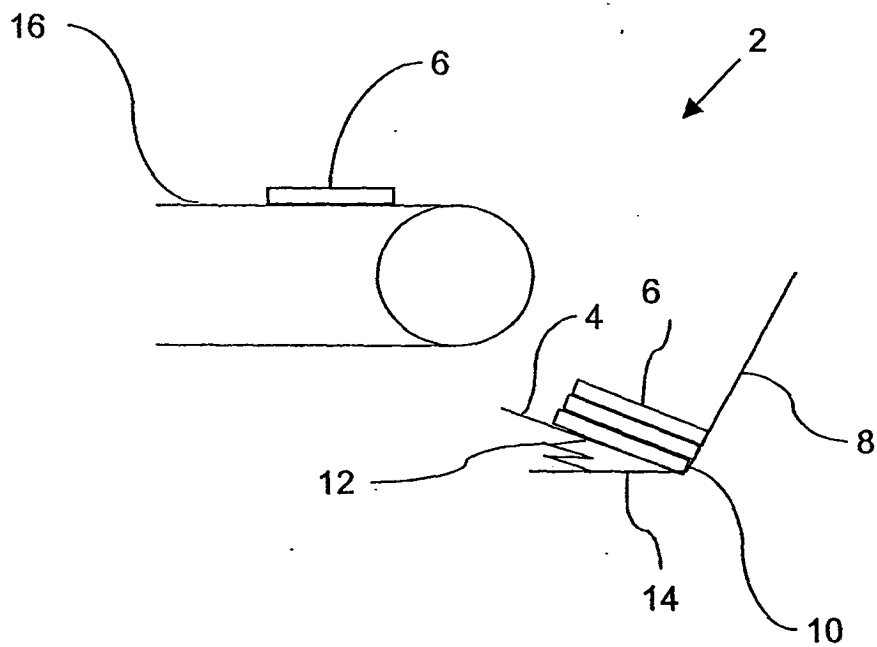


FIG. 2

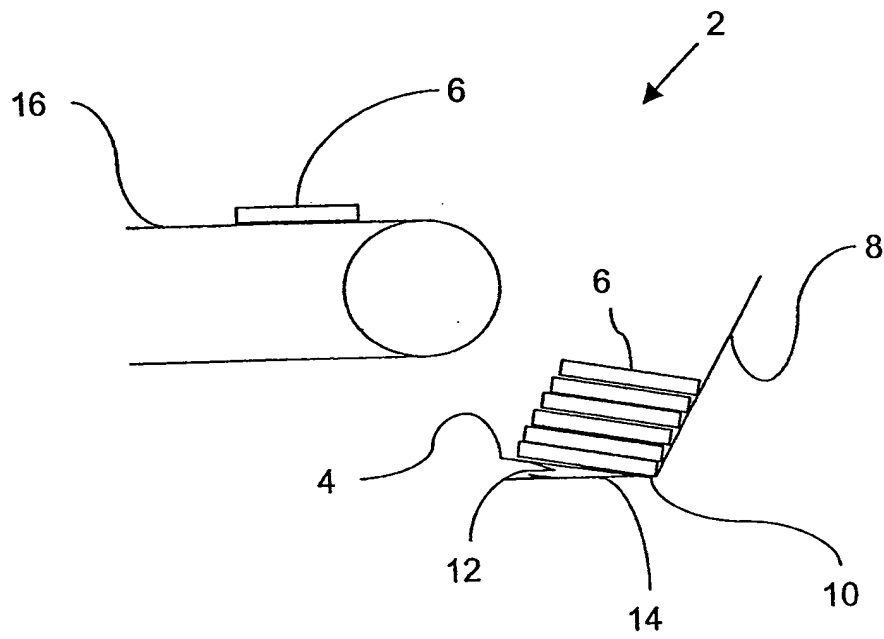


FIG. 3

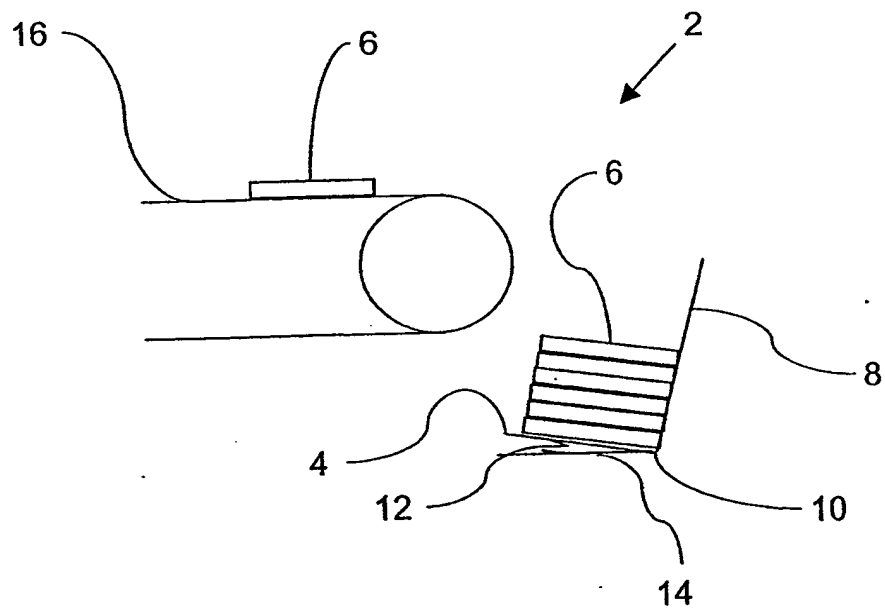


FIG. 4

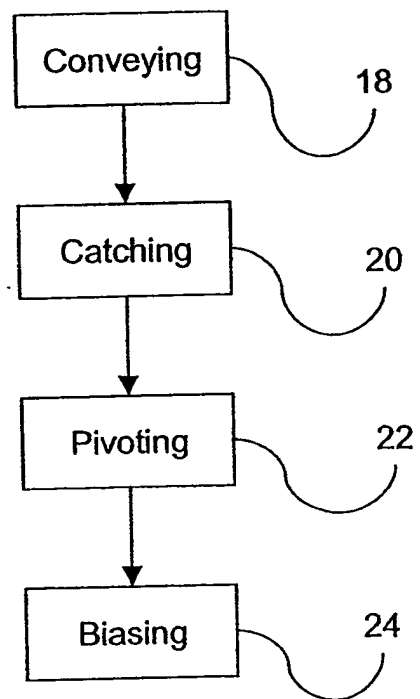


FIG. 5



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 04 25 5120

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                      |                                                      |                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document with indication, where appropriate, of relevant passages                                                                                        | Relevant to claim                                    | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GB 939 288 A (EUREKA SPECIALT PRINTING COMPA) 9 October 1963 (1963-10-09)<br>* figures 1,3 *                                                                         | 1,7                                                  | B65H31/10<br>B65H31/36                       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | US 6 364 309 B1 (TOMATSU YOSHIYA)<br>2 April 2002 (2002-04-02)<br>* figure 6 *                                                                                       | 1,7                                                  |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | PATENT ABSTRACTS OF JAPAN<br>vol. 2003, no. 01,<br>14 January 2003 (2003-01-14)<br>& JP 2002 255431 A (CANON INC),<br>11 September 2002 (2002-09-11)<br>* abstract * | 1,7                                                  |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                      |                                                      | TECHNICAL FIELDS SEARCHED (Int.Cl.7)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                      |                                                      | B65H                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                      |                                                      |                                              |
| Place of search<br>Munich                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      | Date of completion of the search<br>18 November 2004 | Examiner<br>Stroppa, G                       |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                                      |                                                      |                                              |

3  
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 25 5120

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-11-2004

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| GB 939288                                 | A  | 09-10-1963          | NONE                       |                     |
| -----                                     |    |                     |                            |                     |
| US 6364309                                | B1 | 02-04-2002          | JP 2001063832 A            | 13-03-2001          |
|                                           |    |                     | JP 2001063831 A            | 13-03-2001          |
|                                           |    |                     | JP 2001063833 A            | 13-03-2001          |
| -----                                     |    |                     |                            |                     |
| JP 2002255431                             | A  | 11-09-2002          | NONE                       |                     |
| -----                                     |    |                     |                            |                     |