

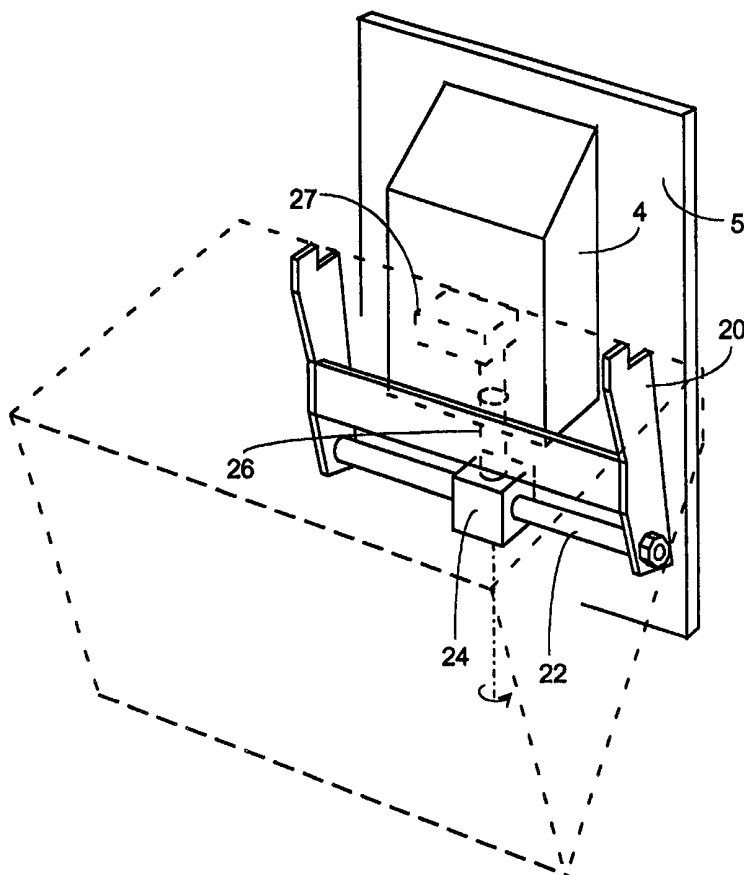


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(21) International Application Number: PCT/DK98/00312 (22) International Filing Date: 6 July 1998 (06.07.98) (30) Priority Data: 0818/97 7 July 1997 (07.07.97) DK (71) Applicant (for all designated States except US): SCANVÆGT INTERNATIONAL A/S [DK/DK]; P.O. Pedersens Vej 18, DK-8200 Århus N (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): KRESS, Robert [DE/DE]; Iserlohnerstrasse 11, D-34497 Korbach (DE). (74) Agent: K. SKØTT-JENSEN PATENTINGENIØRER A/S; Lemmingvej 225, DK-8361 Hasselager (DK).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, GW, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Danish).</i>

(54) Title: WEIGHING-OUT APPARATUS WITH PROJECTING WEIGHING BINS**(57) Abstract**

Weighing-out apparatuses of the type having an annular row of projecting weighing bins with an openable bottom present the problem that operators or servicing persons may inadvertently push on the corners of the bins, whereby the mechanical connections between the weighing bins and their associated weighing cells may be subjected to highly critical twist impacts. It would be possible to arrange for various types of supporting means, but the invention provides for a more suitable solution, viz. in that the weighing bins are suspended in such a manner that they can be resiliently turned out from their normal position. Thus, by appreciable impacts they will yield without transferring critical rotational forcings to their connection with the weighing cell.



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Weighing-out apparatus with projecting weighing bins

The present invention concerns a weighing-out apparatus of the kind which is equipped with an annular row of weighing stations, each with a weighing arrangement with a weighing cell in which a weighing bin with openable bottom is suspended. Typically, what is involved is a so-called combination weighing-out apparatus where over each of the weighing bins there is disposed a receiver-container, in that this ring of receiver-containers receives portions of the items to be weighed from an overlying, radially-extending conveyor system for filling down into the associated weighing bins as soon as these are available. The weighing bins are activated individually for emptying down into an underlying, common receiving funnel, in that control equipment hereby determines which combinations of a small number of weighed part-portions can together provide a final portion of a desired size, so that delivery of said final portion can then be effected from the receiving funnel.

Other criteria for the controlling of the weighed material from the weighing bins can be envisaged, which in the present context is of no importance. The important factor here is the structural configuration of the weighing bins in an outer annular area of the weighing apparatus, where these bins are potentially exposed to external influences, for example by an operator wanting to adjust something or other at a given weighing bin inadvertently pushing on an adjacent corner of a neighbouring weighing bin. When efforts are made to provide a simple and inexpensive suspension of the weighing bins in an individual weighing cell, such lateral influences can be extremely detrimental in maintaining a high degree of weighing accuracy. The problem can naturally be overcome by establishing a fixed guard around the ring of weighing bins, but this is undesirable in that access for manual

intervention, whenever this may be necessary, will be made troublesome, and moreover will increase the total diameter of the apparatus.

5 With the invention, it has been found possible to solve the problem in a fully acceptable manner by letting the weighing bins in the individual weighing stations be connected with the associated weighing cells in such a manner that they are resiliently turnable in a normal plane on their
10 axis connection with the weighing cell. If external pressure is applied on an outer side corner of a weighing bin, the bin will thus merely be resiliently turned out from its normal position without this having any significant effect on the mechanical stability between the weighing cell and the weighing
15 bin. The weighing bins can thus be exposed to quite strong external influences without compromising the weighing accuracy.

 In the following, the invention is explained in more detail with reference to the drawing, in which

20 fig. 1 is a schematic, perspective section view of a weighing-out apparatus according to the invention, while
 fig. 2 is a more detailed view of a weighing bin suspension therein, and
 fig. 3 is a horizontal section through a part of
25 this.

 The apparatus shown in fig. 1 has a number of weighing bins 2 arranged in an annular row and suspended in respective weighing cells in the weighing-cell housings 4 on
30 support plates 5. The bins are provided with an openable bottom flap 6, so that they can be opened to allow the weighed goods to fall down into an underlying common funnel 8 leading to a not-shown emptying area for weighed goods from several of the bins2.

Above each of the bins 2 there is provided a receiving bin 10 which can receive weighed goods from an associated delivery conveyor 14, e.g. a vibratory feeder, which is arranged in a controlled manner to deliver an amount of goods more or less corresponding to the desired part portions to the container 10. When this container's weighing bin is emptied and closed again, the container 10 is emptied into the bin 2 by the opening of a bottom flap 18, after which the conveyor 14 is activated for the re-filling of the container 10. On the basis of accurate weighings of the bins 2, a control unit can thus determine which portions together best constitute a desired measured weight, and on this basis the relevant weighing bins are opened for common delivery to the funnel 8.

As shown in fig. 2, the weighing bins can be suspended on a support frame 20, which via a lower crossbar 22 is fastened to a support block 24 on the lower end of a support pin 26 which extends downwards from the weighing cell housing. Inside the housing 4, this pin is in direct operative connection with a not-shown weighing cell 27.

According to the invention, the support block 24 is arranged on the pin in a pivotable manner and, as shown in fig. 3, in this pivot connection there is inserted a resiliently yielding latching element, e.g. a spring-loaded wedge lock 28 which secures the bar 22 in its normal position, but which, however, allows it to yield if the bin 2 is exposed to an inwardly-directed pressure on one of the outwardly-facing corners, so that it will be only a limited and controlled twisting effect which is transferred to the support pin 26. This will also occur with a side pressure on the outer end of the bin.

As will appear from fig. 1, in the manipulation of one of the bins 2, it can happen relatively easily that a person can push on an adjacent bin, in that the bins lie quite close together, and with the arrangement discussed it will thus be achieved both that the weighing cells are not exposed to cri-

tical rotational forces, and that the bins are made less annoying upon manipulation with or in the adjacent bins.

The invention is not limited to the shown embodiment, in that in principle the desirable resiliency can be established at any point in the relevant transfer system. Moreover, it is not necessary for the bins to be arranged in an annular row, in that it is also known to arrange them in straight rows, and the resiliency can possibly be arranged in other or further directions.

C L A I M S

1. Weighing-out apparatus of the kind which is configured with a mainly annular row of weighing stations, each with a weighing arrangement with a weighing cell in which a weighing bin with an openable bottom is suspended, characterized in that the weighing bins in the individual weighing stations are connected with the associated weighing cells in such a manner that they can be resiliently turned out from their normal planes on their axis connection with the weighing cell.

2. Weighing-out apparatus according to claim 1, whereby each weighing bin is suspended in a support frame which, in behind the weighing bin, is itself supported by a fastening block on a vertical pin part connected with the free end of the weighing cell,

characterized in that the fastening block (24) is pivotably mounted on the vertical pin part (26), and that between these there are spring means which seek to secure the weighing bin in its normal position.

3. Weighing-out apparatus according to claim 1 or 2, characterized in that the weighing bins are stabilised to a limited degree in their normal positions, e.g. by means of wedge locks, in such a way that they can exercise a limited initial resistance against being turned out from their normal positions.

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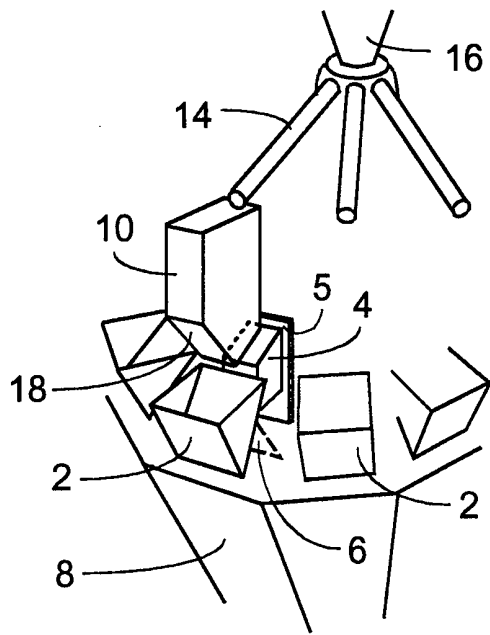


Fig.1

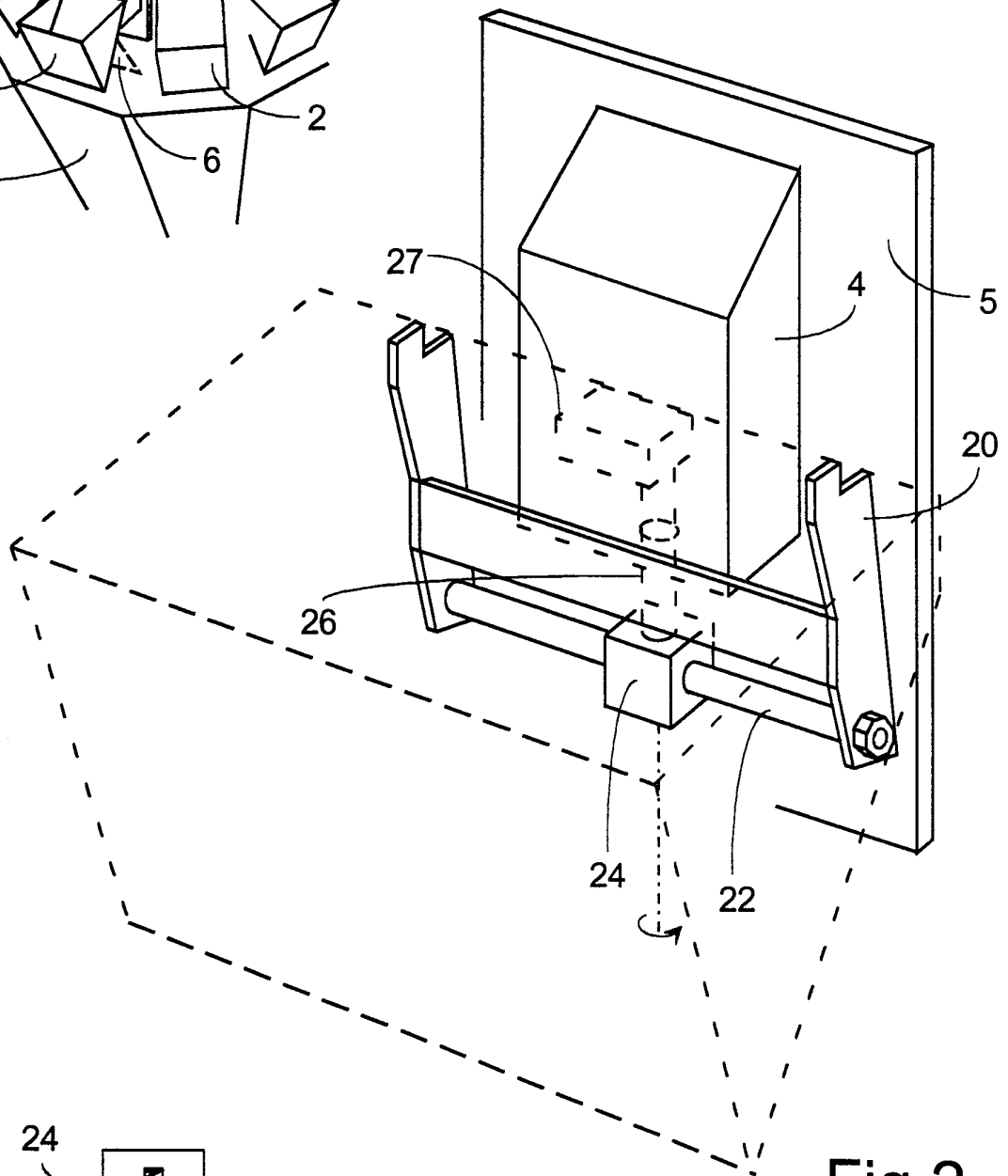


Fig.2

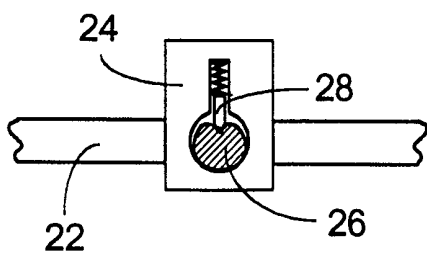


Fig.3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 98/00312

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G01G 19/393, G01G 21/22

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)

IPC6: G01G

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

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4527647 A (K. UEDA), 9 July 1985 (09.07.85), figure 9, abstract --	1-3
A	US 5262598 A (W.D. STOTLER ET AL.), 16 November 1993 (16.11.93), figure 1, abstract --	1-3
A	DE 4407071 A1 (M. TOKIHISA), 7 Sept 1995 (07.09.95), figure 10, abstract --	1-3
A	EP 0261406 A2 (PACKAGE MACHINERY COMPANY), 30 March 1988 (30.03.88), figure 7, abstract --	1-3

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7 December 1998

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0272666 A2 (ROVEMA VERPACKUNGSMASCHINEN GMBH), 29 June 1988 (29.06.88), see the whole document -- -----	1-3

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Information on patent family members

03/11/98

International application No.

PCT/DK 98/00312

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