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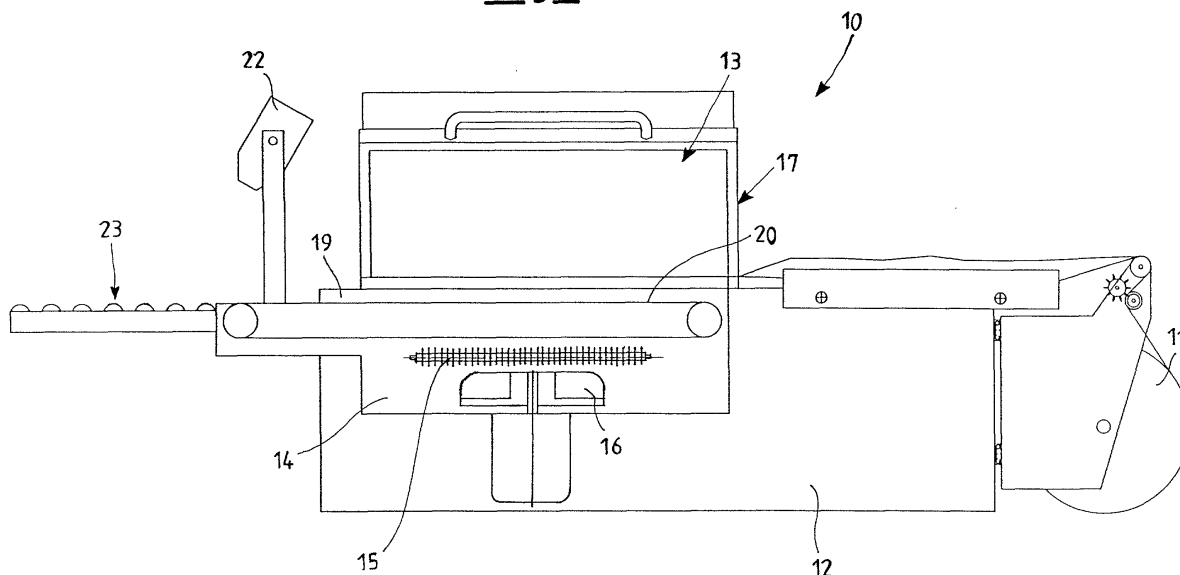
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(54) **Machine with a dome for packaging products in centre-folded heat-shrinking film**

(57) A machine with a dome (10) for packaging products in centre-folded heat-shrinking film (11) comprises a body (12), upon which a mobile dome (13) is applied, where said dome (13) defines a heat-shrinking chamber (14) equipped with at least one heat source (15) and at least one fan (16) for circulating air. A sealing

frame (17) and a transportation and support surface (20) are moreover foreseen. According to the invention, said transportation surface (20) is of the high-friction type, such as to drag the product (21) until it is yanked free from said heat-shrinking film (11) held under sealing rods (18) of said frame (17).

Fig.1



## Description

**[0001]** The present invention refers to a machine with a dome for packaging products in centre-folded heat-shrinking film.

**[0002]** Packaging machines formed from a structure, upon which a mobile dome is hinged, which closes the top of a heat-shrinking chamber, containing a fan for circulating the air and heating means, are known.

**[0003]** The dome is integrated with a cutting and sealing frame, equipped with sealing rods and facing a counterframe, mounted upon the structure.

**[0004]** The chamber is moreover equipped with a support surface of the product in the packaging step.

**[0005]** The product, partially wrapped in the centre-folded film, in other words placed between two flaps of a film folded longitudinally upon itself, is arranged inside the chamber. The dome is lowered so as to activate the sealing blades which close the open sides of the film. At the same time the heated air is made to circulate which causes the shrinking of the film on the product. To pick up the package, the operator lifts the dome to remove the product from the support surface.

**[0006]** Machines with a dome of the known type are mainly used with transparent PVC film, which is easy to seal and to shrink, and does not hold heat. Therefore, the removal of the packaged product from the machine with a dome can be carried out manually by the operator even immediately after the sealing operation. Nevertheless, PVC film has a high cost of purchase, which makes the use of polythene as an alternative, which is substantially more cost-effective, desirable.

**[0007]** However, polythene has the drawback of being more difficult to seal. Indeed, as the dome is lowered the material tends to remain stuck to the sealing rods.

**[0008]** Moreover, polythene accumulates the heat supplied to it in the heat-shrinking step, which tends to last even after exiting the dome. Consequently, the manual removal of the packaged piece, which is still hot, is difficult and above all dangerous for the operator.

**[0009]** The general purpose of the present invention is that of overcoming the aforementioned drawbacks of the prior art in an extremely simple, cost-effective and particularly functional manner.

**[0010]** Another purpose is that of realising a packaging machine which allows greater efficiency in production.

**[0011]** In view of the aforementioned purposes, according to the present invention, it has been thought of to realise a machine with a dome for packaging products in centre-folded heat-shrinking film, having the characteristics outlined in the attached claims.

**[0012]** The structural and functional characteristics of the present invention and its advantages compared to the prior art shall become even clearer from an examination of the following description, referring to the attached drawings, which show a machine with a dome, realised according to the innovative principles of the in-

vention itself.

**[0013]** In the drawings:

- figure 1 is a partial section side elevation view of a machine with a dome of the present invention in a non-operative position;
- figures 2-4 are schematic partial section side elevation views of the machine of figure 1 in three different operating positions;
- figure 5 is a plan view of the machine with a dome of the present invention in the position shown in figure 2.

**[0014]** With reference to the drawings, a machine with a dome for packaging products in centre-folded heat-shrinking film in object is wholly indicated with 10. Only the most useful functional elements for understanding the present invention shall be shown of the structure of the machine, which is per se known and to which a reel of heat-shrinking film 11 is applied.

**[0015]** The machine with a dome 10 comprises a body 12 upon which a mobile dome 13 is hinged which, in lowered position, defines a heat-shrinking chamber 14, equipped with a heat source 15, for example made up of many resistors, and with a fan 16 for forcefully circulating air, schematised in the figures.

**[0016]** The dome 13 carries along the edges a sealing frame 17, equipped with sealing rods 18 and facing a counterframe 19, mounted on the body 12.

**[0017]** The heat-shrinking chamber 14 is, moreover, equipped with a transportation and support surface 20 for a product 21 being treated, or with another equivalent means.

**[0018]** In the embodiment proposed purely as an example the transportation surface 20 consists of a motorised conveyor belt made out of a suitable heat-resistant material of the high-friction type, but it can be replaced by equivalent techniques, for example by motorised rollers. The motorisation, as well as the command device for the transportation surface 20, are not described since they are well known to the man skilled in the art.

**[0019]** The packaging machine 10, object of the present invention, is equipped with a cooling device 22, applied to the body 12 at the exit of the dome 13 and arranged bridging over the transportation surface 20.

**[0020]** At the exit of the dome 13 there is, moreover, a discharge and collection line 23 of the packaged products 21, for example consisting of idle rollers or, alternatively motorised ones should supply be carried out towards subsequent work stations.

**[0021]** The machine with a dome 10, object of the present invention, has specific innovative characteristics for feeding with the reel of heat-shrinking film 11 made out of polythene, without however prejudicing the possibility of using films made of PVC or other.

**[0022]** The operating sequence of the machine is the following: the product 21 is packaged according to sub-

stantially known methods, in other words inserted between the flaps of the centre-folded heat-shrinking film.

[0023] The dome 13 is lowered causing the sealing of the film between the sealing rods 18, of the frame 17 and of the counterframe 19, respectively (figures 2 and 5). In the proposed example the moving of the dome 13 is carried out manually by the operator.

[0024] Nevertheless, the salient characteristics of the machine with a dome 10, object of the present invention, can also be transferred to a machine with automated operation.

[0025] In the machine with a dome 10 according to the invention, after the sealing step, with the dome lowered, the product 21 is made to advance integral with the transportation surface 20 - whether a conveyor belt or another equivalent means of the high-friction type - by a short distance, so as to cause the detachment by yanking of the film held under the sealing rods 18 (figure 3).

[0026] This teaching is indispensable for the use of polythene film which, due to its physical properties, tends to remain applied to the sealing rods 18.

[0027] During this displacement the heat source 15 and the fan for circulating air 16 are activated, which start off the heat-shrinking step.

[0028] Then the dome is opened (figure 4) and the packaged product 21 is removed onto the transportation surface 20. When coming out from the dome 10, the product 21 is conveyed below the bridging cooling device 22, where it is hit by a mass of cold air. Finally, packaged products 21 which are cooled and therefore which can safely be moved by the operator are gathered on the discharge line 23.

[0029] From that which is described above with reference to the figures, it is clear how a machine with a dome for packaging products in centre-folded heat-shrinking film according to the invention is particularly useful and advantageous. The purpose mentioned in the preamble of the description is thus achieved.

[0030] Of course, the shapes of the machine with a dome of the invention can be different to those shown just as a non-limiting example in the drawings, just as the materials can be different.

[0031] The scope of protection of the invention is therefore defined by the attached claims.

(20) is of the high-friction type, such as to drag the product (21) until it is yanked free from said heat-shrinking film (11) held under sealing rods (18) of said frame (17).

2. Machine with a dome according to claim 1, **characterised in that** it is equipped with a cooling device (22) of heat-wrapped products (21) at the exit of said dome (13).
3. Machine with a dome according to claim 2, **characterised in that** said cooling device (22) is arranged bridging over said transportation and support surface (20).
4. Machine with a dome according to claim 1, **characterised in that** it is equipped with a discharge and collection line (23) of products (21).
5. Machine with a dome according to claim 4, **characterised in that** said discharge and collection line (23) is a roller table.
6. Machine with a dome according to claim 1, **characterised in that** said heat-shrinking film (11) is polythene.

## Claims

1. Machine with a dome (10) for packaging products in centre-folded heat-shrinking film (11) comprising a body (12), upon which a mobile dome (13) is applied, where said dome (13) defines a heat-shrinking chamber (14) equipped with at least one heat source (15) and at least one fan (16) for circulating air, with a sealing frame (17) and a transportation and support surface (20) being moreover foreseen, **characterised in that** said transportation surface

Fig.1

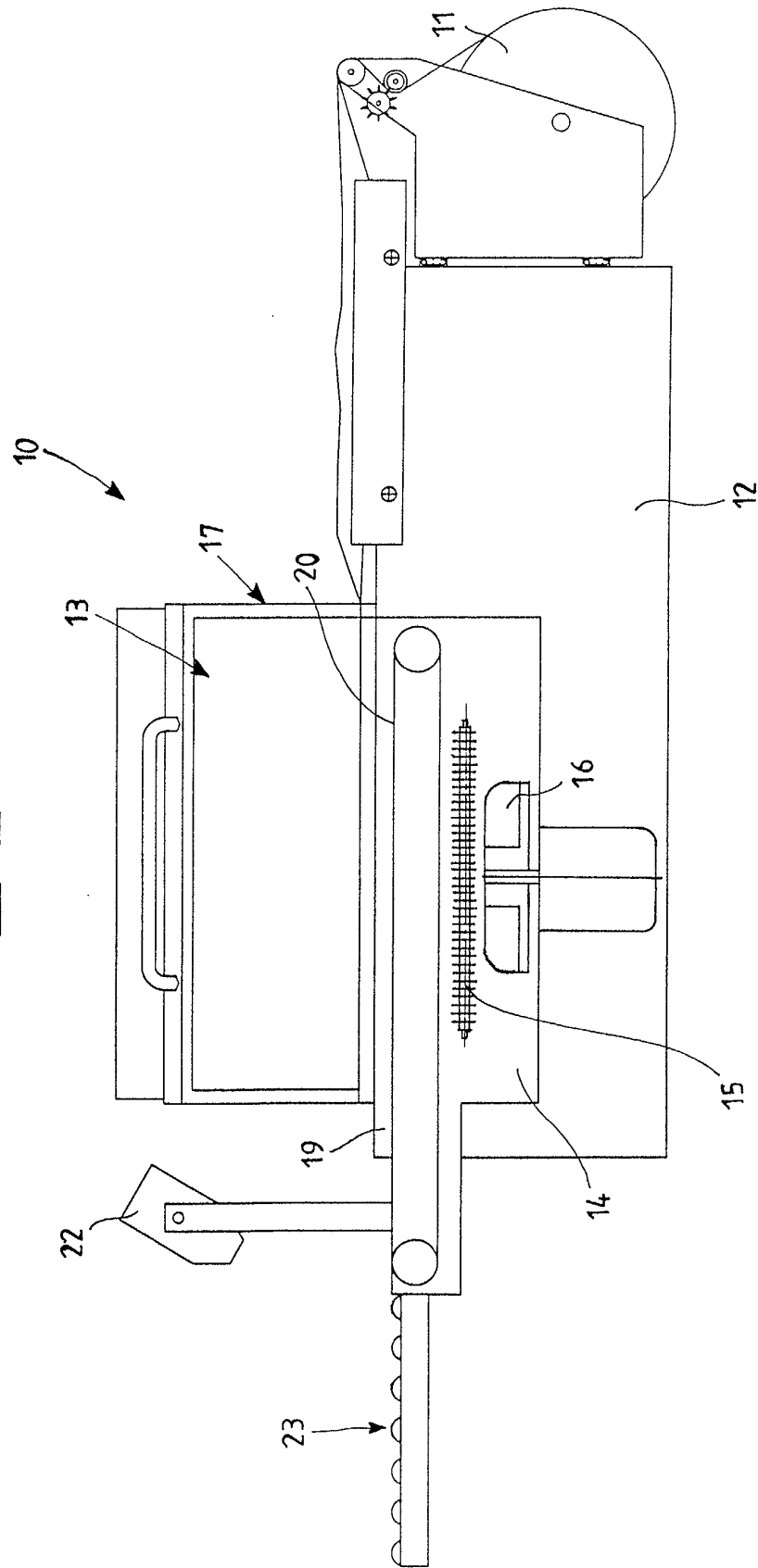


Fig.2

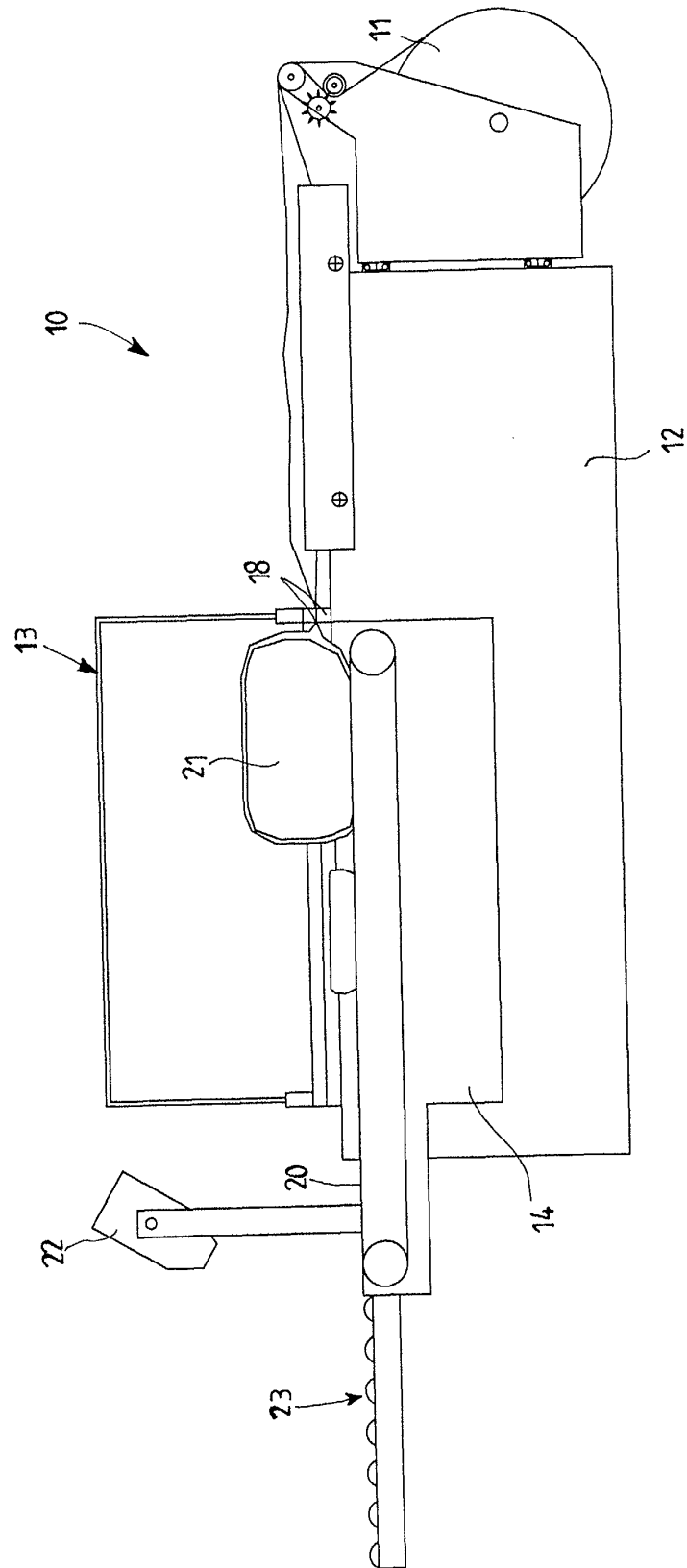


Fig. 3

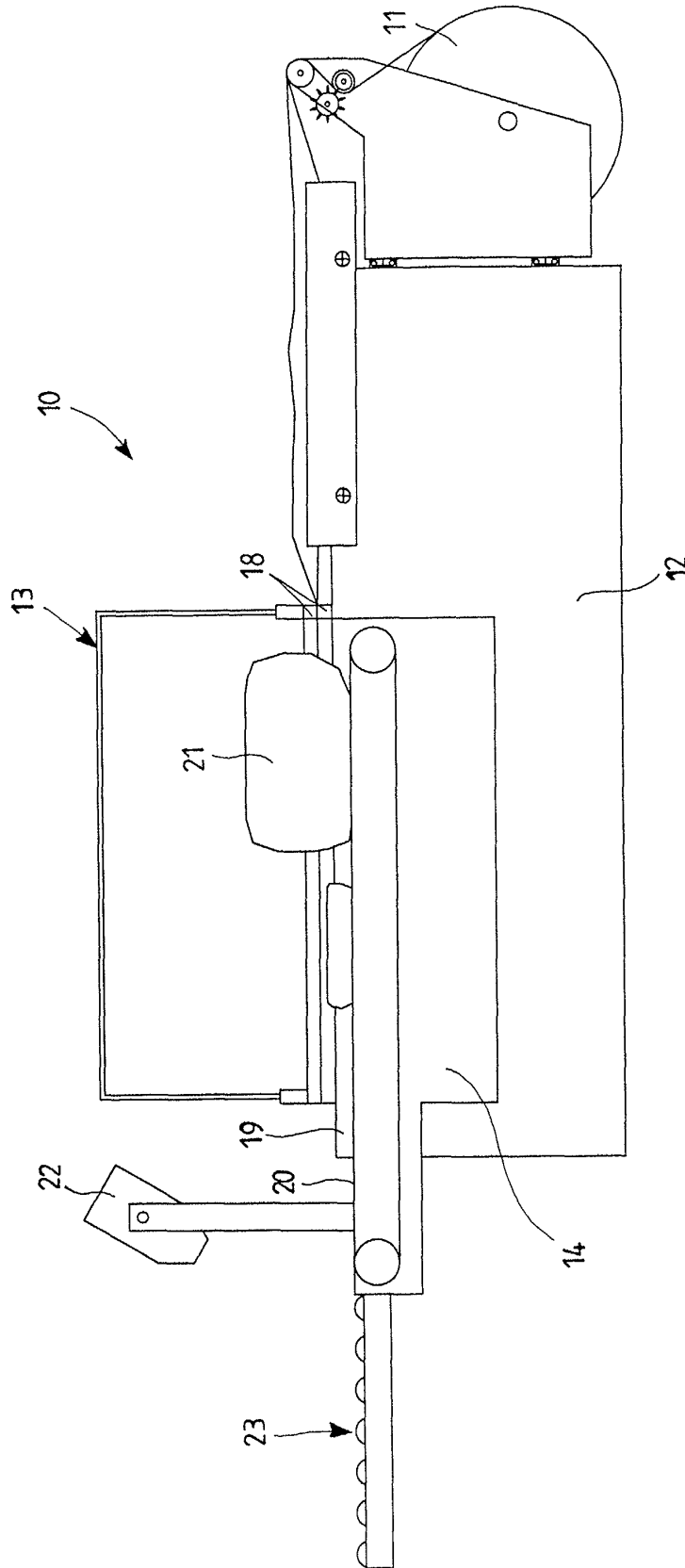
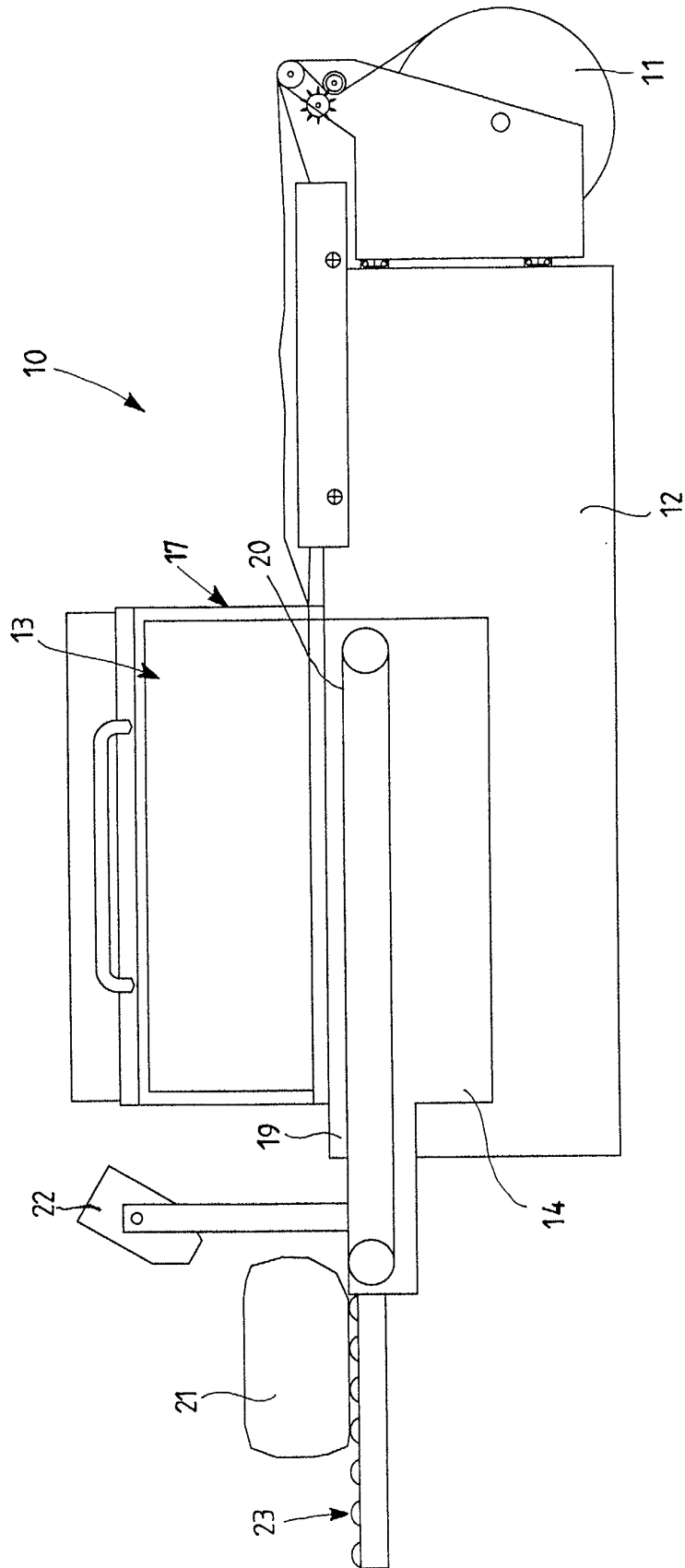
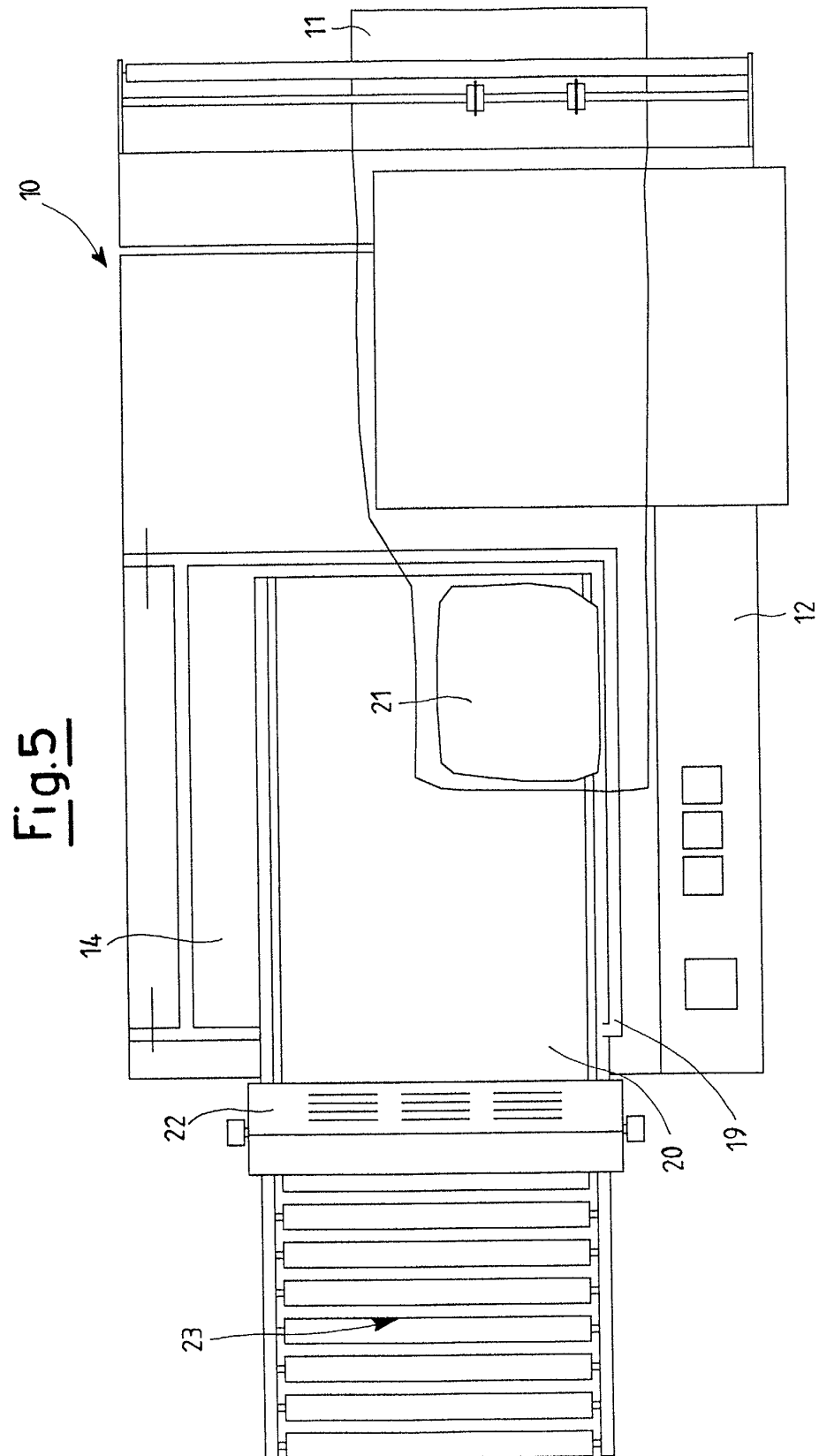


Fig.4









European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 02 07 7996

| 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  | US 4 104 848 A (TORRE FRANCESCO)<br>8 August 1978 (1978-08-08)<br>* column 2, line 7 - column 3, line 14;<br>figure 1 * | 1                                | B65B9/06<br>B65B53/06                        |
| A  | EP 0 689 994 A (BUHRS ZAANDAM BV)<br>3 January 1996 (1996-01-03)<br>* column 1, line 14 - line 38; figure 2 *           | 1                                |  |
| A  | GB 986 079 A (ICI LTD)<br>17 March 1965 (1965-03-17)<br>* page 2, line 5 - line 13 *                                    | 1,6                              |  |
| A  | US 5 299 406 A (LAURY DANIEL J)<br>5 April 1994 (1994-04-05)<br>* figure 2 *  | 1,2                              |  |
| A  | US 4 162 604 A (BARTOLOMEI GIUSEPPE)<br>31 July 1979 (1979-07-31)<br>* the whole document *                             | 1                                |  |
|  |   |                                  | TECHNICAL FIELDS SEARCHED (Int.Cl.7)         |
|  |   |                                  | B65B   |
| The present search report has been drawn up for all claims   |   |                                  |  |
| Place of search  |   | Date of completion of the search | Examiner                                     |
| THE HAGUE  |   | 21 November 2002                 | Vigilante, M                                 |
| CATEGORY OF CITED DOCUMENTS<br>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<br>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>& : member of the same patent family, corresponding document |   |                                  |  |

EPO FORM 1503 03/82 (P04001)

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

EP 02 07 7996

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  
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21-11-2002

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|---|---------------------|----------------------------|---------------------|
| US 4104848                                | A | 08-08-1978          | IT 1024614 B               | 20-07-1978          |
|   |   |                     | AR 216461 A1               | 28-12-1979          |
|   |   |                     | AT 382578 B                | 10-03-1987          |
|   |   |                     | AT 137977 A                | 15-08-1986          |
|   |   |                     | BE 851934 A1               | 16-06-1977          |
|   |   |                     | BR 7701310 A               | 20-12-1977          |
|   |   |                     | CH 615126 A5               | 15-01-1980          |
|   |   |                     | DE 2708791 A1              | 08-09-1977          |
|   |   |                     | ES 456498 A1               | 16-11-1978          |
|   |   |                     | FR 2342894 A1              | 30-09-1977          |
|   |   |                     | GB 1574172 A               | 03-09-1980          |
|   |   |                     | HK 25082 A                 | 18-06-1982          |
|   |   |                     | JP 1170498 C               | 17-10-1983          |
|   |   |                     | JP 52125086 A              | 20-10-1977          |
|   |   |                     | JP 58001015 B              | 08-01-1983          |
|   |   |                     | NL 7701866 A ,B,           | 06-09-1977          |
|   |   |                     | PT 66257 A ,B              | 01-04-1977          |
|   |   |                     | SE 422562 B                | 15-03-1982          |
|   |   |                     | SE 7702317 A               | 04-09-1977          |
| EP 0689994                                | A | 03-01-1996          | NL 9401064 A               | 01-02-1996          |
|   |   |                     | DE 69507207 D1             | 25-02-1999          |
|   |   |                     | DE 69507207 T2             | 02-09-1999          |
|   |   |                     | EP 0689994 A1              | 03-01-1996          |
|   |   |                     | JP 8058748 A               | 05-03-1996          |
|   |   |                     | US 5613351 A               | 25-03-1997          |
| GB 986079                                 | A | 17-03-1965          | NONE                       |                     |
| US 5299406                                | A | 05-04-1994          | FR 2680154 A1              | 12-02-1993          |
|   |   |                     | AT 129214 T                | 15-11-1995          |
|   |   |                     | CA 2075215 A1              | 08-02-1993          |
|   |   |                     | DE 69205521 D1             | 23-11-1995          |
|   |   |                     | DE 69205521 T2             | 27-06-1996          |
|   |   |                     | EP 0527091 A1              | 10-02-1993          |
|   |   |                     | IL 102663 A                | 29-06-1995          |
|   |   |                     | JP 5262330 A               | 12-10-1993          |
| US 4162604                                | A | 31-07-1979          | BR 7604648 A               | 31-01-1978          |