(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 759 997 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.03.2007 Bulletin 2007/10

(21) Application number: **06110267.9**

(22) Date of filing: **22.02.2006**

(51) Int Cl.:
B65B 43/30 *(2006.01)* ***B65B 43/34*** *(2006.01)*
B65B 5/06 *(2006.01)* ***B65B 43/56*** *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **29.08.2005 IT MI20051606**

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(54) **Equipment for inserting packets into bags**

(57) Equipment (10) for inserting packets (11) into bags (12) comprises a device (30) suitable for deforming the bag and squaring and stiffening means (40) of the bag suitable for forming a draft and guide for the insertion of one or more packets of products.

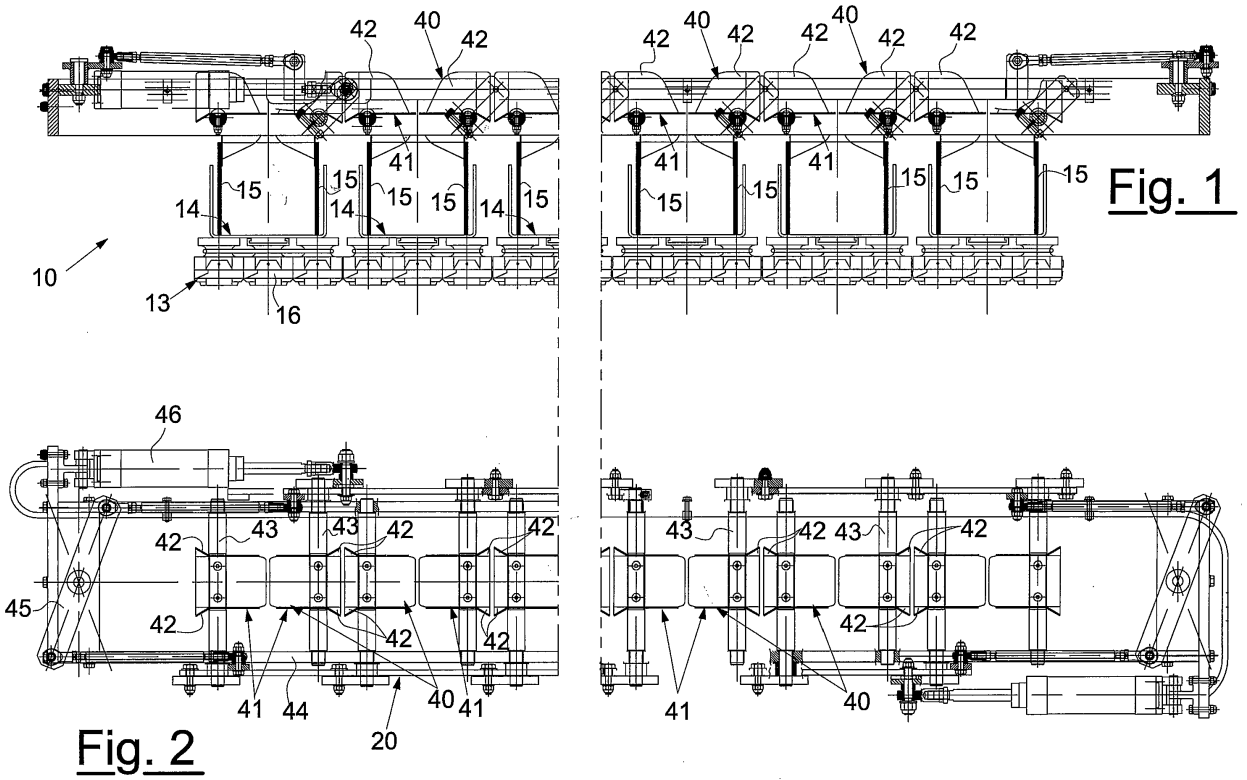

Fig. 1

Fig. 2

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Description

[0001] The present invention relates to equipment for inserting packets into bags.

[0002] More specifically, the invention relates to equipment for the insertion of sealed packets preferably containing food products, into bags.

[0003] The packaging of products grouped into sealed packets, is currently effected using boxes, for example made of cardboard, in which the formed and sealed packets are inserted.

[0004] For reasons linked to preserving the product fragrance, which, in the case of aromatic or spicy products, such as tea, is of fundamental importance, the use of bags for the external packaging, instead of boxes, has become widely diffused.

[0005] The packaging of containers which have a limited rigidity or are of the semi-soft type, such as a bag, however, causes considerable problems, for example in the insertion phase of the packet or in the arrangement of several packets in a bag.

[0006] This problem is particularly felt with respect to a rapid and effective seizure and moving and also to the necessity of an orderly arrangement of the packets inside the bag.

[0007] A different drawback of the types of packaging according to the known art, relates to the materials used, polyethylene and other plastic materials for the packets and box cover, and cardboard, and therefore a cellulose material, for the box itself.

[0008] These different materials lead to the necessity of a differentiated collection and impose, according to the laws in force in certain Countries, additional costs for the producer.

[0009] The necessity is currently felt for effecting packaging by means of packets inserted into bags and providing equipment for the insertion of packets containing products into bags.

[0010] One of the main objectives of the present invention consists in providing equipment which allows the automated and optimized insertion of one or more packets inside a bag.

[0011] A further objective of the invention consists in providing equipment of the type mentioned above, suitable for operating on soft packets.

[0012] The Applicant has now found that it is possible to effect the packaging of packets inside bags by means of insertion equipment comprising a device suitable for deforming the bag and squaring and stiffening means of the bag, suitable for forming a draft and guide for the insertion of one or more packets of products.

[0013] An aspect of the present invention relates to equipment for inserting packets into bags comprising a device suitable for deforming the bag and squaring and stiffening means of the bag, suitable for forming a draft and guide for the insertion of one or more packets of products according to what is specified in claim 1.

[0014] Further characteristics of the invention are the object of the dependent claims.

[0015] The characteristics and advantages of equipment for the insertion of packets into bags according to the present invention will appear more evident from the following illustrative and non-limiting description referring to the schematic drawings wherein:

figure 1 is a raised schematic side view of a portion of the equipment according to the invention;
figure 2 is a plan view of the portion of equipment of figure 1;
figure 3 is a plan view of a deformed bag before the intervention of the squaring and stiffening means;
figure 4 is a partial raised section which represents the insertion phase by means of the equipment according to the invention.

[0016] With reference to the figures, these illustrate a piece of equipment 10 for the insertion of sealed packets 11 preferably containing food products, inside bags 12.

[0017] The equipment can obviously be used for any kind of product packed inside a packet 11 of the rigid or soft type, but is electively used in the field of the packaging of fragrant and aromatic food products, such as tea which, once inserted in sachets, is first sealed inside packets 11 and is then packed into bags 12 having a limited rigidity.

[0018] In particular, the bags are made of plastic materials such as polyethylene for food or similar, and have a limited rigidity which allows self-sustainment in an open position and in elevation.

[0019] In this respect, the bag 12 preferably has a substantially parallelepiped form with side walls 12a positioned parallel to the translation direction of the bags and front walls 12b, transversal to said direction.

[0020] The equipment is described with reference to a single line 13 and bags 12 suitable for containing two overlying packets 11, in industrial applications, however, it can be made up of a series consisting of parallel production lines, and various rows of overlying packets can be inserted inside the bags.

[0021] The number of lines or packets to be inserted in each bag can vary according to the production demands and in relation to the dimensions of the products.

[0022] The equipment, object of the present invention is integrated in an insertion station 20 in a packaging plant, and is arranged along a feeding line 13 of bags coming from a forming plant or from a distributor and supported on trays 14 having folded edges 15, suitable for containing and also supporting the bags. Adjacent to said bag feeding line 13, there is a feeding of sealed packets containing the products.

[0023] Said feeding can consist of a parallel or transversal line with respect to the bag feeding line, or can envisage other packet feeding means allowing an adequate rate.

[0024] The line 13 comprises a conveyor 16 for moving the trays 14 between the various operating stations.

[0025] In particular, a predefined number of trolleys is transported to the introduction station 20 which envisages the presence, above the line 13 for each bag, of a bag deformation device 30 and squaring and stiffening means 40 of the bag, suitable for forming a draft and guide for the insertion of one or more packets of products.

[0026] The deformation device of the bag comprises a pair of suction sleeves 31 which can be transversally translated, symmetrically and synchronously, with respect to the moving direction of the bags (in the direction of the arrows F of figure 3) and are positioned opposite each other to the side of the bag 12 close to its upper opening 12' and in a central position so as to withhold by suction a portion of each side wall 12a of the bag.

[0027] The suction sleeves 31 are subsequently withdrawn and cause the deformation of the bag by enlarging the mouth 12' to facilitate the introduction of the squaring and stiffening means 40.

[0028] The squaring and stiffening means 40 are mainly aimed at squaring the mouth of the bag and effecting the necessary stiffening for allowing the rapid and precise introduction of the packets 11.

[0029] In particular, these squaring and stiffening means 40 are electively used with packages of the soft type, for which they also have a guiding function for correct positioning inside the bag.

[0030] In this respect, they can be produced in various equivalent forms such as simple perimetric frames or also as fingers destined for the four edges of the bag. Although the form described and illustrated is preferable for soft packets, it should be considered as being purely illustrative.

[0031] The squaring and stiffening means 40 according to the preferred embodiment of the present invention comprise a pair of shaped blades 41 having flap-folded side edges 42 so as to produce a "U" section.

[0032] Said blades are supported by pins 43, capable of effecting a rotation and bringing the blades to a horizontal position in which they cover the mouth 12' in a substantially vertical position by rotation of about 90 degrees, whereby the ends of the blades are inserted inside the bag, engaging the front walls 12b squaring the bag; the suction sleeves 31 contemporaneously stop their suction action and release the side walls which, squared by the flaps 42, give the mouth 12' of the bag a square form having a maximum amplitude.

[0033] In this position, the insertion of the packets is extremely easy, and they are carried by suitable gripping means 21 suitable for the type of packet to be transported and programmed in relation to the type of packet and quantity of packets to be inserted in each bag.

[0034] The rotation of the pins 43 and consequently of the shaped blades 41 is advantageously effected by means of suitable leverisms comprising a pair of rods 44, one for each side of the station 20, connected at the ends by means of transmission levers 45 and driven by at least one linear actuator 46, preferably two linear actuators 46, capable of producing the opening, i.e. the downward rotation for the squaring of the bag, and the closing, i.e. the upward rotation to free the bag after the introduction of the packet or packets.

[0035] The single pins 43 are connected to said rods 44 so as to transfer the translating movement provided by each linear actuator 46 to an angulation rotation sufficient (for example about 90 degrees) for passing from one position to another.

[0036] In this way a synchronized movement is obtained of both the series of blades envisaged in the station in both the opening and closing for the whole station 20.

Claims

1. Equipment (10) for inserting packets (11) into bags (12) **characterized in that** it comprises a device (30) suitable for deforming the bag (12) and squaring and stiffening means (40) of the bag (12) suitable for forming a draft and guide for the insertion of one or more packets (11) of products.

2. The equipment (10) according to claim 1, wherein said device (30) comprises a pair of suction sleeves (31) which can be transversally translated, symmetrically and synchronously, with respect to the moving direction of the bags and are positioned opposite each other to the side of the bag (12) close to its upper opening (12') and in a central position so as to withhold by suction a portion of each side wall (12a) of the bag.

3. The equipment (10) according to claim 2, wherein said squaring and stiffening means (40) comprise a pair of shaped blades (41) having flap-folded side edges (42) so as to produce a "U" section.

4. The equipment (10) according to claim 3, wherein said shaped blades (41) are supported by pins (43) capable of effecting a rotation and bringing the blades to a horizontal position in which they cover the mouth (12') in a substantially vertical position by rotation of about 90 degrees, whereby the ends of the blades are inserted inside the bag, engaging the front walls (12b) and give the mouth (12') of the bag a square form having a maximum amplitude.

5. The equipment (10) according to claim 4, wherein said pins (43) are connected to rotation leverisms comprising a pair of rods (44), one for each side of the station, connected at the ends by means of transmission levers (45) and driven by at least one linear actuator (46), preferably two linear actuators (46).

6. The equipment (10) according to claim 5, wherein said equipped is positioned along a feeding line (13) of bags (12) coming from a forming plant or from a distributor and supported on trays (14) having folded

edges (15), suitable for containing and also supporting the bags.

7. The equipment (10) according to claim 6, wherein said bags are made of a plastic material such as polyethylene for food or similar, and have a limited rigidity which allows self-sustainment in an open position and in elevation and have a substantially parallelepiped form delimited by side walls (12a) positioned parallel to the translation direction of the bags and front walls (12b), transversal to said direction.

8. The equipment (10) according to claim 6, wherein said packets (11) are of the soft type.

9. A packaging plant equipped with equipment (10) according to any of the previous claims.

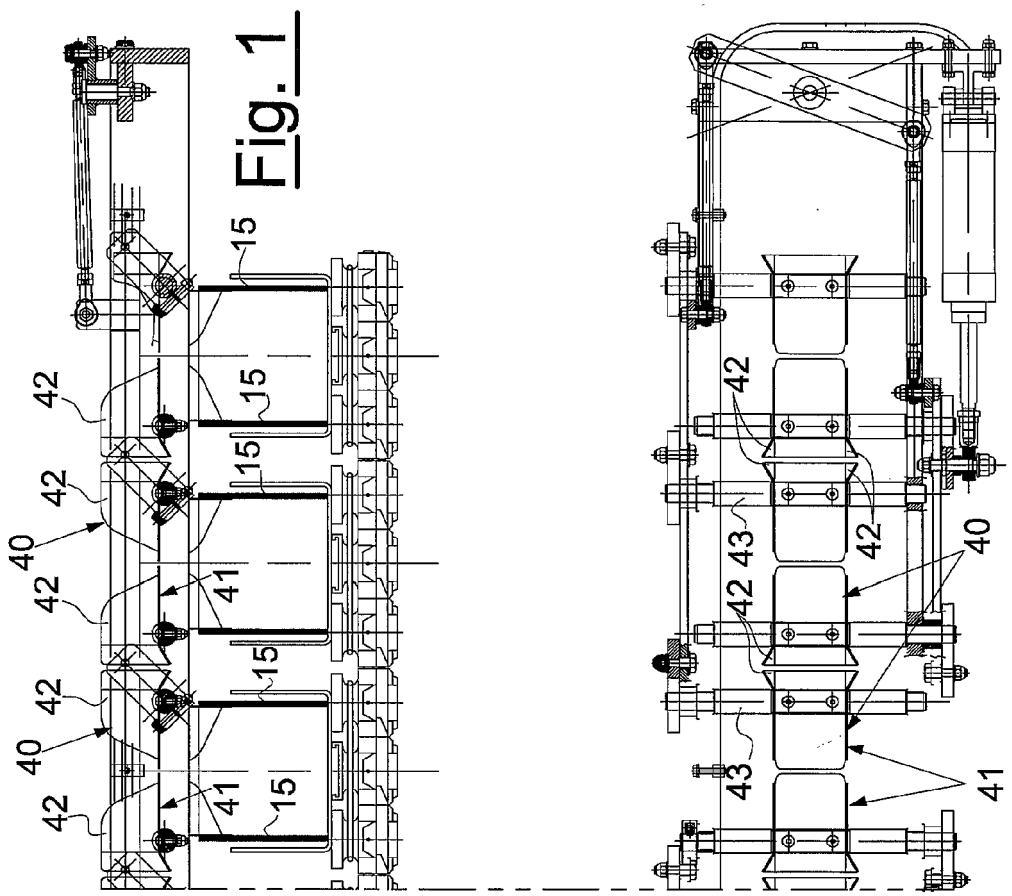


Fig. 1

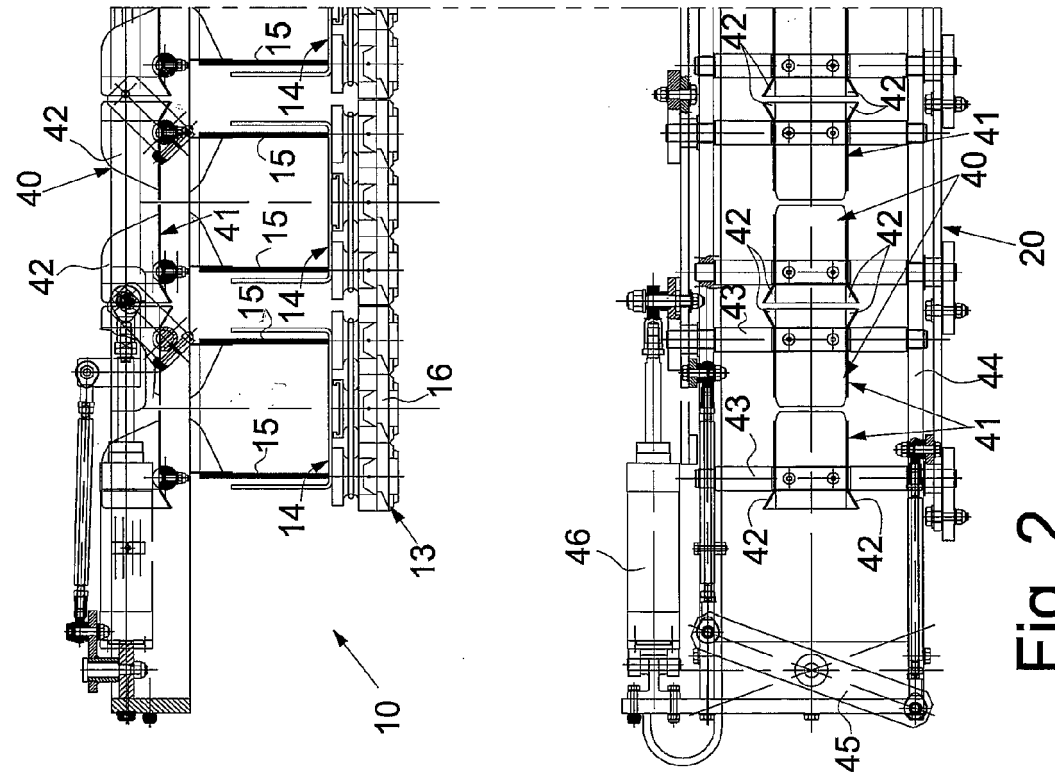
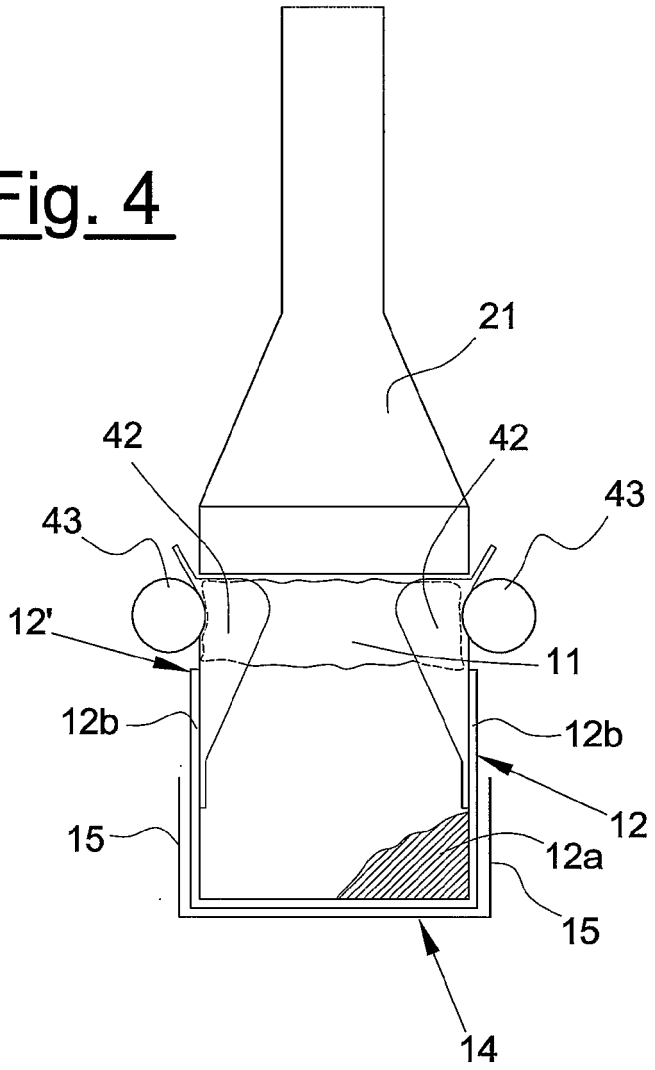


Fig. 2

Fig. 4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12b
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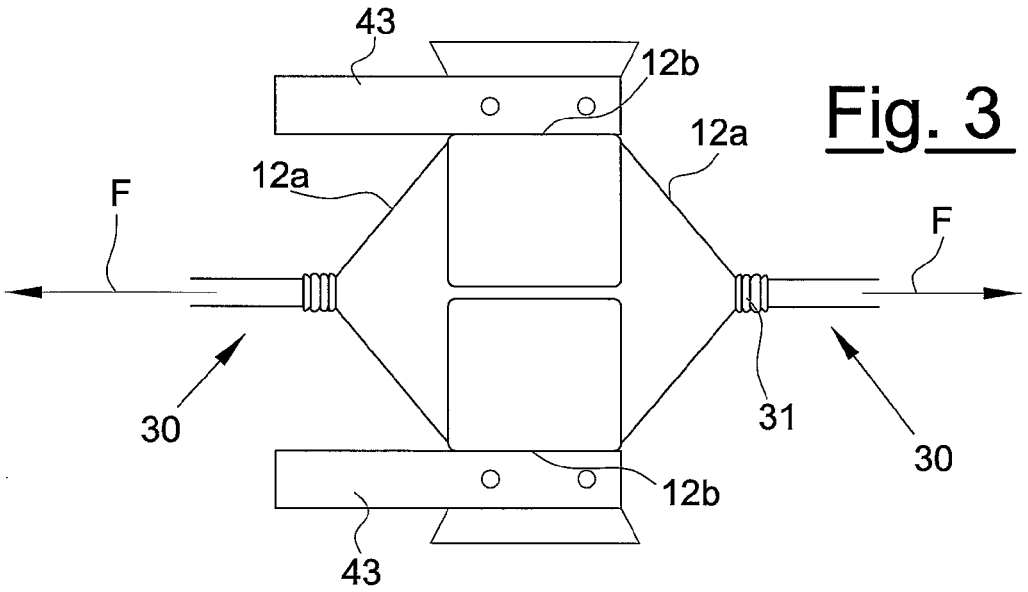
Fig. 3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12a
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EUROPEAN SEARCH REPORT

Application Number
EP 06 11 0267

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 5 428 938 A (DAVIS ROBERT [CA]) 4 July 1995 (1995-07-04) * column 2, line 20 - column 4, line 38; figures * -----	1,3,8,9 2,4-7	INV. B65B43/30 B65B43/34 B65B5/06 B65B43/56
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B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 December 2006	Jagusiak, Antony

CATEGORY OF CITED DOCUMENTS

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