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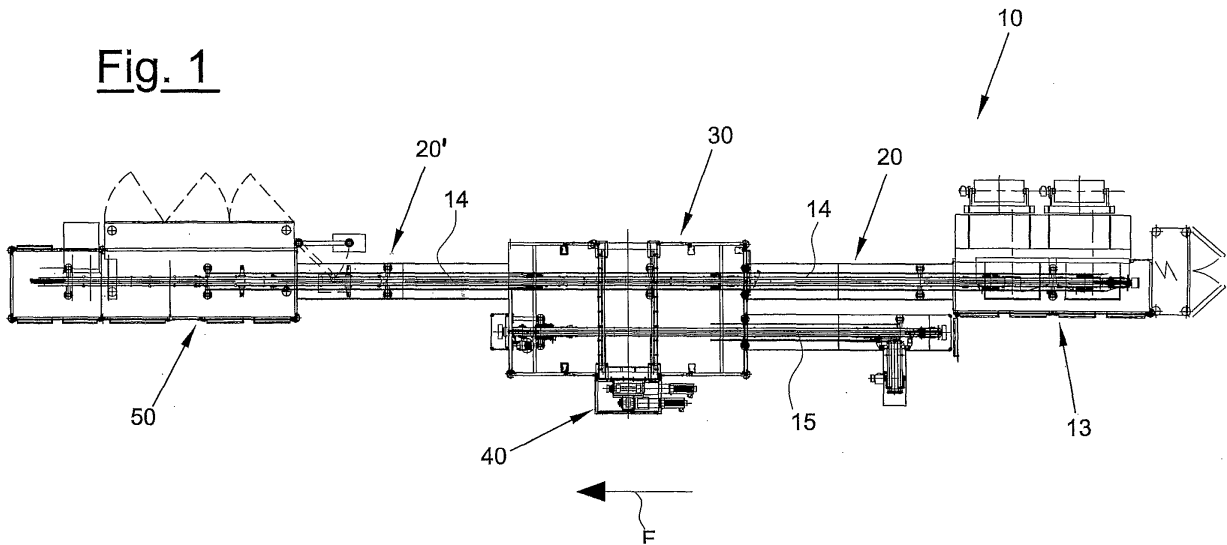
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(54) Equipment and method for packaging packets of products in bags

(57) Equipment (10) for the packaging of packets (11) in bags (12) comprises a bag forming device (13), a transfer line (14) of the formed bags by means of a conveyor with independent trolleys or drawers or inde-

pendent compartments, a feeding line of packets of products (15), an accumulation and desynchronization area (20), a filling station (30) operating by means of an insertion device (40) of the packets into bags, and a closing station (50) of the bags filled with packets.

Fig. 1



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Description

[0001] The present invention relates to equipment and a method for the packaging of packets of products in bags.

[0002] 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.

[0003] 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.

[0004] In some countries, moreover, regulations relating to the disposal of waste products, due to the imposition of taxations at times extremely high, limit the possibility of diversifying the packing used for packaging.

[0005] The packaging of containers which are limitedly rigid or semi-soft, such as a bag, however, causes considerable problems, for example in the insertion phase of the pack 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 handling and also to the necessity of an orderly arrangement of the packets inside the bag, in addition to the time necessary for the insertion of the packet which must allow the contemporaneous discharge of air contained in the bag.

[0007] For the optimization of the packaging operations, it is therefore necessary to synchronize the forming of the bags with the filling operations, taking into account the production demands.

[0008] In the current state, the necessity is consequently felt for effecting packaging by the insertion of packets into bags and producing adequate equipment for the packaging and providing an operative method suitable for allowing the packaging of packets of products, in particular for packets of the soft type and with a varying configuration, inside bags.

[0009] One of the main objectives of the present invention consists in providing equipment and a method for the automated and optimized packaging of packets of products into bags.

The Applicant has found that it is possible to effect the packaging of packets inside bags by means of equipment for the packaging of packets of products in bags comprising a bag forming device, a transfer line of the formed bags by means of a conveyor with independent trolleys or drawers or independent compartments, a feeding line of packets of products, an accumulation and desynchronization area, a filling station operating by means of an insertion device of the packets into bags, and a closing station of the bags filled with packets.

[0010] The use of the conveyor with independent trolleys for the transfer of bags also allows the desynchronization between the forming, filling and closing equipment of the bags which, however, can operate continu-

ously or batchwise in relation to the specific necessities.

[0011] An aspect of the present invention relates to equipment for the packaging of packets of products into bags, according to what is specified in claim 1.

5 **[0012]** Another aspect of the invention relates to a method for the packaging of packets of products into bags according to what is indicated in claim 7.

[0013] Further characteristics of the invention are object of the dependent claims.

10 **[0014]** The characteristics and advantages of equipment and a method for the packaging of packets of products 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 schematic plan view of the packaging equipment according to the invention;

figure 2 is a partial raised section which represents the insertion phase of a packet inside a bag, in the equipment according to the invention.

20 **[0015]** With reference to the figures, these illustrate equipment 10 for the packaging of packets 11 of products into bags 12, which comprises, following the production direction F of figure 1, a bag forming device 13 advantageously operating in continuous, a transfer line 14 of the formed bags by means of a conveyor with independent trolleys or drawers or independent compartments, a feeding line 15 of packets 11 of products, an accumulation and desynchronization area 20, a filling station 30 operating by means of an insertion device 40 of the packets into bags, and a closing station 50 of the bags 12 filled with packets 11.

30 **[0016]** The equipment according to the invention can naturally be used for any kind of products, packed inside a package 11 of the rigid or soft type, and can operate in combination with any insertion apparatus, operating from above.

40 **[0017]** The equipment according to the invention can be electively used in the field of the packaging of fragrant and aromatic food products, such as tea which, once inserted in bags, is first sealed inside packets 11 and is then packed into bags 12 having a limited rigidity.

45 **[0018]** In particular, the bags 12 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.

50 **[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 according to the invention is described with reference to a single production line, 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

into each bag can obviously vary according to the production demands and in relation to the dimensions of the products.

[0022] The bag forming device 13 produces bags in continuous availing of one or more forming heads in relation to the production demands.

[0023] The formed bags 12 are then positioned on independent trolleys 16 integral with the transfer line 14 and reach an accumulation and desynchronization area 20 where they are accumulated until they reach the necessary number.

[0024] The sealed packets 11 already containing the products are contemporaneously fed in a substantially similar manner onto the feeding line 15.

[0025] Said feeding line 15 envisages the accumulation of packets in a number equal to the bags which are accumulated along the line 14.

[0026] The accumulation area 20 allows a number of products and bags to be accumulated, which is higher than the number of products and bags contemporaneously processed by the filling station 30 so as to form a lung which allows the asynchronous functioning of the bag forming station 13, of the packet feeding line 15 and filling station 30.

[0027] This system makes it possible to operate contemporaneously on a high number of packets and bag to effect the filling of the bags with packets.

[0028] The filling station 30 operates by means of an insertion device 40 of the packets inside bags, which, by contemporaneously processing the series of packets and bags reaching the station, allows all the necessary opening and squaring operations of the bags, together with the seizure, transporting and insertion operations of the packets into the bags without having to slow down the forming of the bags and/or production of sealed packets of products.

[0029] In this respect the insertion device 40 of the packets inside the bags comprises a pneumatic system 41 for the seizure and transfer of the packet and squaring and stiffening means 42 which 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) and which also act as insertion guides for the pneumatic system 41 and are envisaged at the mouth of the bag to facilitate the insertion of the packet.

[0030] Once the filling of the whole series of bags envisaged has been completed, these are transferred to a second accumulation area 20' and are subsequently sent individually to the closing station 50 of the bags 12 filled with packets 11, in which folding or sealed closure is effected according to production requirements.

[0031] A continuous movement is then re-established, which operates with the same optimized forming rate of the bags and production of sealed packets.

[0032] The packaging method of packets of products into bags according to the present invention therefore envisages the following phases:

- a) advantageously forming bags 12 in continuous;
- b) positioning the formed bags 12 on independent trolleys 16 integral with a transfer line 14 of the formed bags which allows them to be accumulated;
- c) feeding packets 11 of products to a feeding line 15 of packets 11 of products;
- d) transferring bags 12 and packets 11 to an accumulation and desynchronization area 20;
- e) feeding packets 11 and bags 12 to said accumulation and desynchronization area 20 until a predefined number is reached;
- f) filling the bags 12 by means of an insertion device 40 of the packets into said bags;
- g) sending the filled bags 12 to a closing station 50 of the bags.

Claims

1. Equipment (10) for the packaging of packets of products (11) in bags (12), **characterized in that** it comprises a bag forming device (13), a transfer line (14) of the formed bags by means of a conveyor with independent trolleys or drawers or independent compartments, a feeding line of packets of products (15), an accumulation and desynchronization area (20), a filling station (30) operating by means of an insertion device (40) of the packets into bags, and a closing station (50) of the bags filled with packets.
2. Packaging equipment (10) according to claim 1, wherein the bag forming station is predisposed for operating in continuous, the filling station batchwise, the closing station in continuous.
3. Packaging equipment (10) according to claim 1, wherein said packets (11) are of the soft type.
4. Packaging equipment (10) according to claim 1, wherein said bags (12) 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.
5. Packaging equipment (10) according to claim 1, wherein said bags (12) are preferably produced in a substantially parallelepiped form.
6. Packaging equipment (10) according to claim 1, wherein said filling station (30) is integrated with an insertion device (40) of packets into bags, equipped with squaring and stiffening means (42) aimed at squaring the mouth of the bag and effecting the necessary stiffening for allowing the rapid and precise introduction of the packets (11) and a pneumatic system (41) for the seizure and transfer of the packets suitable for inserting them into the bags.

7. A method for packaging packets of products into bags operating by means of equipment according to the previous claims, **characterized in that** it comprises the following phases:
- 5
- a) advantageously forming bags (12) in continuous;
- b) positioning the formed bags (12) on independent trolleys (16) integral with a transfer line (14) of the formed bags which allows them to be accumulated;
- 10
- c) feeding packets (11) of products to a feeding line (15) of packets (11) of products;
- d) transferring bags (12) and packets (11) to an accumulation and desynchronization area (20);
- 15
- e) feeding packets (11) and bags (12) to said accumulation and desynchronization area (20) until a predefined number is reached;
- f) filling the bags (12) by means of an insertion device (40) of the packets into said bags;
- 20
- g) sending the filled bags (12) to a closing station (50) of the bags.
8. The packaging method according to claim 7, wherein said packets (11) are of the soft type.
- 25
9. The packaging method according to claim 7, wherein said bags (12) are made of plastic materials such as polyethylene for food or similar, and have a limited rigidity and substantially parallelepiped form which allows self-sustainment in an open position and in elevation.
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10. The packaging method according to claim 7, wherein said filling phase f) is effected inside said filling station (30) integrated with an insertion device (40) of packets into bags, equipped with squaring and stiffening means (42) aimed at squaring the mouth of the bag and effecting the necessary stiffening for allowing the rapid and precise introduction of the packets (11) and a pneumatic system (41) for the seizure and transfer of the packets suitable for inserting them into the bags.
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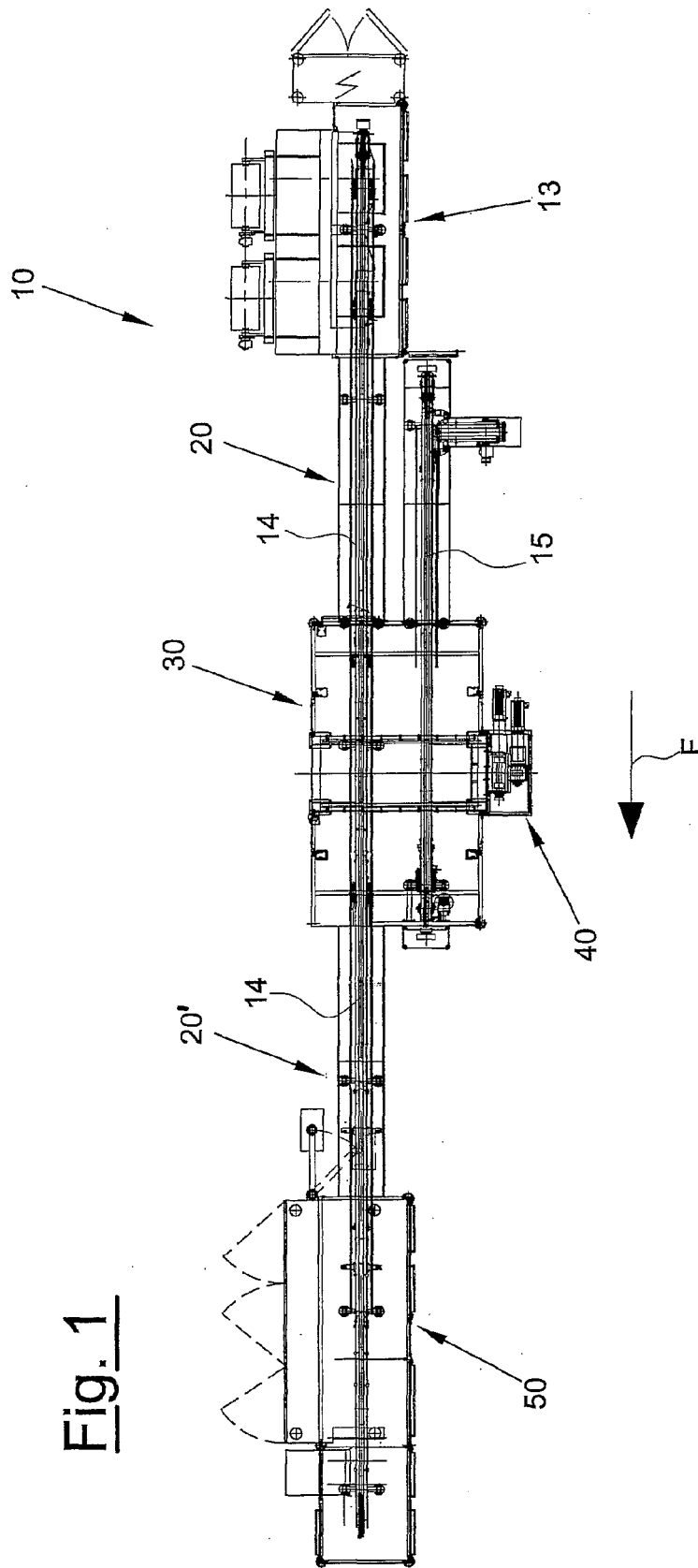
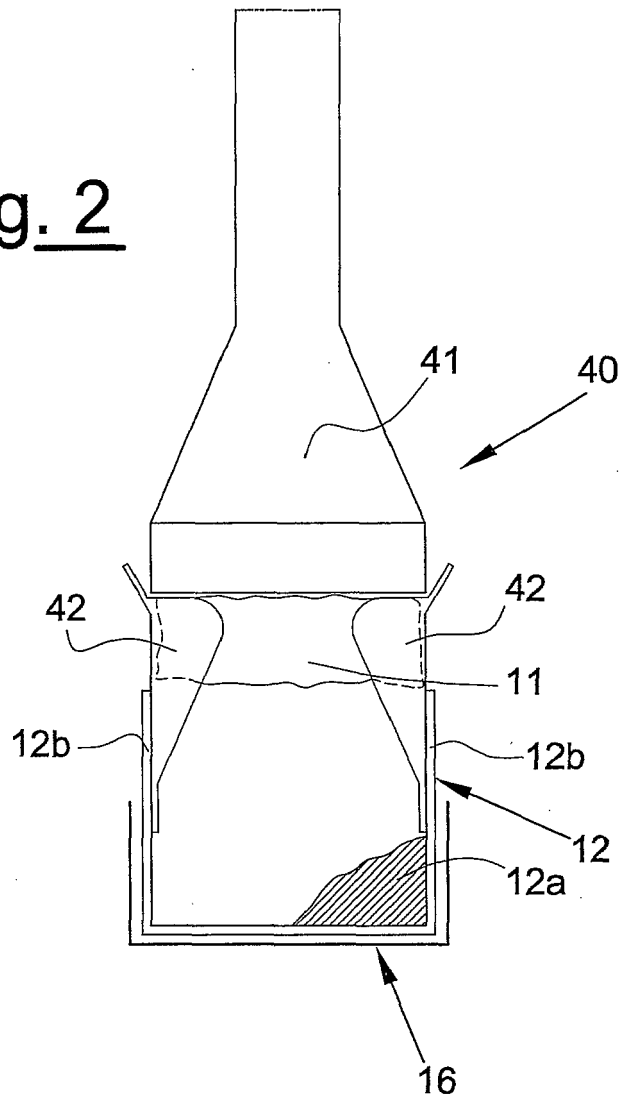


Fig. 1

Fig. 2





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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 December 2006	Examiner Jagusiak, Antony
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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