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(54) **Process for manufacturing a packeting machine**

(57) A process (1) for manufacturing a packeting machine (10) adapted to make a plurality of bags (50), each of said bags (50) defining a filling volume (50a) containing a product, said packeting machine (10) including at least one continuous sheet (51) moved along a feeding trajectory (11) and defining a front portion (51a) and a back portion (51b) of said plurality of bags (50) and said manufacturing process (1) comprising a manufacturing step (2) including: manufacture of directional guide means

(14) adapted to define a feeding trajectory (11), a plurality of manufacturing sub-steps (4) in each of which an operating module (12) is made, manufacture of an electric panel (20) and manufacture of a base structure (21); the manufacturing sub-steps (4) are carried out in parallel and the manufacturing process (1) comprises an assembling step (3) following the manufacturing step (2), in which the operating modules (12) are operatively connected with each other and to the electric panel (20) and structurally secured to the base structure (21).

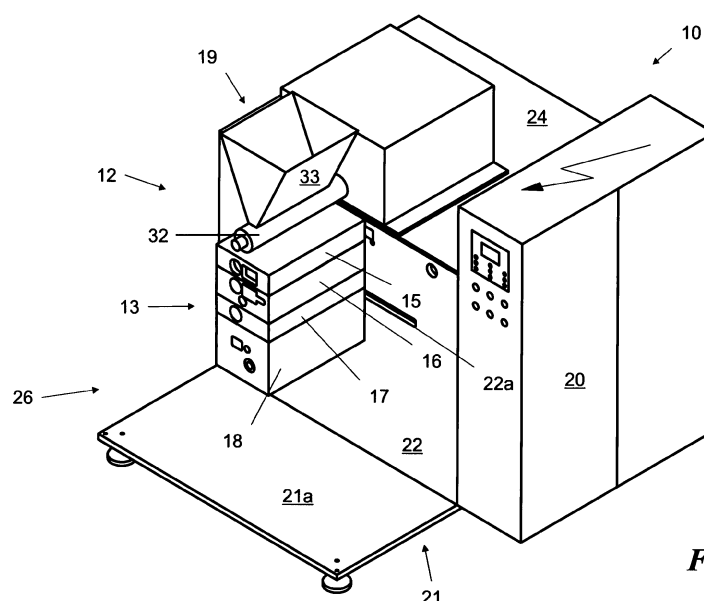


Fig. 1

Description

[0001] The present invention relates to a process for manufacturing a packeting or packing machine, of the type pointed out in the preamble of the first claim.

[0002] The packeting/packing machines are machines in particular adapted to bind up in packages, in the form of single-use portions, products in a granular or powdery state (such as sugar, salt, coffee, baking powder, etc.), in a liquid or semisolid state (ketchup, mayonnaise, shampoo, etc.), and in a solid state (tablets, pills, etc.) as well as dry or wet paper tissues (for glass cleaning, soaked with a mosquito repellent, etc.) in the following briefly referred to as the "product".

[0003] It is known that presently there are various types of packeting machines. They are adapted to form sachets, bags or pouches holding the product, starting from a sheet of heat-sealable packaging material. The heat-sealable packaging material, first disposed on a reel, is cut out into two opposite portions that are mutually joined along particular lines and then cut off into a plurality of rectangular portions. In addition, during the joining process introduction of the product occurs, so that the machine produces already filled packages or bags.

[0004] The known packeting machines consist of a supporting structure to which different components forming it are rigidly and fixedly secured. These components are therefore fastened both to each other and to the supporting structure and many electric and mechanical connections are required for each of them in order to allow control of the operations and ensure the electric power supply. In particular, due to the complex connections of each component the packeting machines and the parts forming them are required to be made following a precise sequence of operations, carried out by qualified workers.

[0005] The above mentioned known art has some important drawbacks.

[0006] In fact, the operations for making a packeting machine can be carried out simultaneously only by one or two qualified workers at most. In fact, several persons cannot physically act on the same machine due to the lack of space. Consequently, accomplishment of these machines is very slow. The present drawback is very important if we think that these machines are generally made on demand, following particular specifications. Therefore these machines cannot be stored in warehouses while waiting for orders.

[0007] In addition, known packeting machines are not very modifiable after they are made. In fact, complicated and long operations are required for modifying the features of same, such as sizes of the obtained bags, amount of said bags, type of product contained therein.

[0008] Actually, if the machine features are to be changed, it is necessary to dismantle and re-assemble an important portion of the machine, in which portion many components and electric connections are included. These operations are very complicated and time-consuming to such an extent that in some cases they are

even impossible.

[0009] Another problem resulting from the difficulty in removing the modules is the slowness in carrying out the servicing operations, which will increase the down time and, consequently, the production times and costs.

[0010] A further problem also of importance and connected with the complexity of the connections between the different modules is represented by the long time required for obtaining this packeting machines and, as a result, the particularly high cost of same.

[0011] Under this situation, the technical task underlying the present invention is to conceive a process for manufacturing a packeting machine capable of substantially obviating the mentioned drawbacks.

[0012] Within the scope of this technical task it is an important aim of the invention to provide a manufacturing process capable of providing a packeting machine characterised by a high flexibility, i.e. able to quickly change the sizes of the bags to be obtained or the product to be packaged therein.

[0013] Another important aim of the invention is to provide a process capable of obtaining a packeting machine in a quick and cheap manner.

[0014] The technical task mentioned and the aims specified are achieved by a process for manufacturing a packeting machine as claimed in the appended claim 1. Preferred embodiments are highlighted in the sub-claims.

[0015] The features and advantages of the invention are clarified hereinafter by the detailed description of a preferred embodiment of the invention, with reference to the accompanying drawings, in which:

Fig. 1 shows the outer structure, in front view, of the packeting machine made in accordance invention;

Fig. 2 shows the operation of the packeting machine;

Fig. 3 is a rear and partly cut away view of the outer structure of the packeting machine obtained by the process of the invention;

Fig. 4 shows some bags made with said packeting machine;

Fig. 5 is a block diagram of the process of the invention; and

Fig. 6 is a further block diagram of a portion of the process.

[0016] With reference to the figures, the manufacturing process of a packeting machine according to the invention is generally identified by reference numeral 1, which process is adapted to obtain a packeting machine 10 for packaging small portions of a product into bags 50.

[0017] In particular, it is adapted to make a plurality of bags 50 usually consisting of two layers preferably of a heat-sealable packaging material, suitably superposed and mutually joined so as to delimit a filling volume 50a containing said product. Bags 50 are manufactured starting from a continuous sheet 51 made of said heat-sealable packaging material, that is separated in a front por-

tion **51a** and a back portion **51 b**. The two portions 51 a and 51 b therefore face each other and are joined along sealing lines defining the filling volumes 50a of the bags 50. Simultaneously with sealing, the packaging machine 10 also introduces the product into volume 50a.

[0018] The packaging machine 10 briefly comprises: directional guide means **14** adapted to move the continuous sheet 51 along an advancing or feeding trajectory **11** and a plurality of operating modules **12**, adapted to treat the sheet 51 of heat-sealable packaging material, as hereinafter specified.

[0019] The operating modules 12 include: an unrolling module **14a**, part of the directional guide means 14, a filling module **19** for introducing the product into the filling volume 50a and a plurality of work modules **13**. Said work modules 13 comprise: a longitudinal-sealing module **15** for carrying out a plurality of longitudinal seals **52** substantially parallel to said feeding trajectory 11 and designed to join said back portion 51 b to said front portion 51 a; a transverse sealing module **16** for making a plurality of transverse seals **53** substantially perpendicular to said feeding trajectory 11; a longitudinal-cutting module **17** and a transverse-cutting module **18** for at least partly separating said plurality of seals 52 and 53 into two parts. The machine 10 further includes an electric panel **20** for operation of the machine itself 10 and adapted to be brought into electric connection with the operating modules 12, and a base structure **21** on which the operating modules 12 and the control panel 20 are structurally secured.

[0020] From a structural point of view the packaging machine 10 is therefore supported by the base structure 21.

[0021] Said base structure consists of a base plate **21a** defining a rest surface, a partition **22**, two side walls **23** and an upper plate **24** placed on said side walls 23. Structure 21 therefore divides the machine space into regions: a rear region **25** enclosed by the side walls 23 and the upper plate 24, and a front region **26**, as shown in Figs. 1 and 3.

[0022] In particular, at the rear region 25 there is the unrolling module 14a and the control panel 20.

[0023] At the front region 26 there are the work modules 13, and the filling module 19 comprises a container **33** for the product, placed on said upper plate 24 and a dispenser **32** placed over the front portion 26.

[0024] These operating modules 12 are structurally fastened through suitable attachment means adapted to enable the structural connection of the individual modules. In particular, the connection of each of the modules to the base structure 21 is obtained by a plurality of attachment means adapted to create a connection of the individual type, i.e. adapted to enable one of the modules to be connected and disconnected independently of the others.

[0025] Each connection advantageously involves a mechanical attachment means for steadily fastening the module to the structure 21 and an electric attachment

means for electrically connecting at least the work 13 and filling 19 modules to the electric panel 20.

[0026] Furthermore, the partition 22 has at least one opening **22b** (Fig. 6) adapted to receive a portion of the modules 13 to be put in place, in order to ensure correct positioning of same, and releasable connecting means such as screws or friction fits, to make the modules rigidly secured to the partition 22.

[0027] In order to make the connection and separation operations easier, each module 12 consists of a structurally unitary block.

[0028] The electric connection between the modules and the electric panel 20 is preferably made as follows: the first part, i.e. that between the operating modules 12 and the electric attachment means is obtained through at least one connecting cable with which each module is equipped; the second part, i.e. that between the electric attachment means and the electric panel 20 is obtained through a plurality of cables housed in raceways or other similar elements adapted to enclose the cables fixing them to the base structure 21.

[0029] The partition 22 advantageously also has a slot **22a** (Fig. 1) for enabling passage of the continuous sheet 51 from the rear region 25 to the front region 26. Slot 22a is advantageously placed in the vicinity of opening 22b.

[0030] Then a separator **31** is advantageously provided in the vicinity of slot 22a and is adapted to divide or cut the sheet 51 into two parts, separating the front portion 51 a from the back portion 51 b. In particular, separator 31 is housed in the rear region 25 and linked to the partition 22 close to slot 22a.

[0031] The previously mentioned directional guide means 14, on the contrary, is made up partly of the unrolling module 14a placed in the rear region 25, and partly of the directional guide rollers **30** placed in the front region 26. In detail, the unrolling module **14a** comprises a reel-carrying axis **27** adapted to contain the continuous sheet 51 made of a heat-sealable packaging material and initially wound up, and a plurality of deviation rollers **28**. The deviation rollers 28 are also structurally linked to side panels **29** constituting the unitary structure of the unrolling module 14a. The directional guide rollers 30, on the contrary, guide the sheet 51 following separation of same into the two portions 51 a and 51 b and feed the work modules 13, as shown in Fig. 2.

[0032] The work modules 13 and filling module 19 contain components known by themselves.

[0033] The sealing modules 15 and 16 comprise opposite rollers for example, which include heated portions exerting a counter reaction on the two portions 51 a and 51 b of the continuous sheet 51 of sealable packaging material. These heated portions therefore form said seals 52 and 53.

[0034] The cutting modules 17 and 18 comprise opposite blades adapted to define cutting or separation lines of bags 50.

[0035] The filling module 19 comprises the container 33 connected to dispenser 32. The latter comprises a

plurality of nozzles adapted to introduce the product into the bags 50.

[0036] Operation of the packaging machine 10 is the following.

[0037] The sheet 51 is initially rolled up on the reel-carrying axis 27. Subsequently said sheet is unrolled along the trajectory 11 defined by the directional guide means 14. In particular, sheet 51 is unrolled along a first portion of the feeding trajectory 11, from the reel-carrying axis 27 to slot 22a, defined by the unrolling module 14a. After passing through slot 22a, each of the two portions 51a and 51 b is suitably directed on correspondingly opposite sides of the feeding trajectory 11. The two portions 51 a and 51 b finally are disposed opposite to and facing each other along the work modules 13.

[0038] First of all, the longitudinal seals 52 of the two portions 51 a and 51 b of the continuous sheet 51 of sealable packaging material are made along the work modules 13.

[0039] Subsequently, the transverse seals 53 are simultaneously made and the product is introduced so that said product remains entrapped in bags 50.

[0040] The cutting modules 17 and 18 then carry out cutting-out or separation lines of the bags that are ultimately laid down in suitable containers.

[0041] Hereinafter described is the manufacturing process 1 of a packaging machine 10 illustrated above.

[0042] It contemplates two main steps: a manufacturing step 2 in which at least part of the individual operating modules 12 are made, and an assembling step 3 in which the operating modules 12 are operatively connected with each other and to the electric panel 20 and structurally secured to the base structure 21, as shown in Fig. 6.

[0043] In particular, the operating modules 12 constituting the packaging machine 10 are made at least partly in parallel. By the term "parallel" it is intended that the operating modules 12 can be made independently of each other. Therefore it is possible to simultaneously work on several operating modules 12.

[0044] In greater detail, the manufacturing step 2 comprises a plurality of manufacturing sub-steps 4 in each of which an operating module 12 is made such as in particular the sealing modules 15 and 16, the filling module 19 and the cutting modules 17 and 18 and preferably also the unrolling module 14a.

[0045] The manufacturing step 2 further comprises manufacture of the directional guide means 14, manufacture of said one electric panel 20 and of said one base structure 21.

[0046] The manufacturing sub-steps 4 of the operating modules 12 are made in parallel, as previously said.

[0047] The invention enables important advantages to be achieved.

[0048] In fact, the manufacturing process 1 allows an automatic packaging machine 10 to be made in a shorter period of time and therefore with more reduced production costs. This advantage is due to the fact that several operations can be superposed in time so that the pro-

duction time becomes shorter.

[0049] Another advantage resides in that the packaging machine 10, due to the possibility of individually removing the modules 12, is characterised by very reduced servicing and intervention times.

[0050] A further important advantage is represented by the high flexibility of the packaging machine 10. In fact, since the modules can be attached and removed quickly and by simple operations, both the sizes of the bags 50 and the type or amount of the product contained therein can be easily varied.

[0051] The invention is susceptible of variations all falling within the inventive idea. All of the details can be replaced by equivalent elements and the materials, shapes and sizes can be of any nature and magnitude.

Claims

1. A process (1) for manufacturing a packaging machine (10) adapted to make a plurality of bags (50), each of said bags (50) defining a filling volume (50a) containing a product, said packaging machine (10) including at least one continuous sheet (51) moved along a feeding trajectory (11) and defining a front portion (51a) and a back portion (51b) of said plurality of bags (50) and said manufacturing process (1) being **characterised in that** it comprises a manufacturing step (2) including: manufacture of directional guide means (14) adapted to define a feeding trajectory (11), and a plurality of manufacturing sub-steps (4) in each of which an operating module (12) is made, said operating modules (12) comprising: at least one sealing module (15, 16) adapted to carry out a plurality of seals (52, 53) joining said back portion (51 b) to said front portion (51a) and defining said filling volumes (50a), a filling module (19) for introducing said product into said filling volume (50a), at least one cutting module (17, 18) adapted to at least partly separate said plurality of seals (52, 53) into two parts, said manufacturing step (2) further comprising: manufacture of an electric panel (20) suitable to control said packaging machine (10) and to be electrically connected with said operating modules (12) and manufacture of a base structure (21) for supporting said operating modules (12) and control panel (20), said manufacturing sub-steps (4) of said operating modules (12) being carried out in parallel and said manufacturing process (1) comprising an assembling step (3) subsequent to said manufacturing step (2), in which said operating modules (12) are operatively connected with each other and to the electric panel (20) and structurally secured to the base structure (21).
2. A manufacturing process (1) as claimed in claim 1, wherein said operating modules (12) comprise an unrolling module (14a) made in said manufacturing

sub-steps (4), said unrolling module being part of said directional guide means (14) and being adapted to define the first part of said feeding trajectory (11).

3. A manufacturing process (1) as claimed in one or more of the preceding claims, wherein said sealing modules comprise a longitudinal-sealing module (15) for carrying out a plurality of longitudinal seals (52), substantially parallel to said feeding trajectory (11). 5
4. A manufacturing process (1) as claimed in one or more of the preceding claims, wherein said cutting modules comprise at least one longitudinal-cutting module (17) adapted to at least partly separate said plurality of longitudinal seals (52) into two parts. 10
5. A manufacturing process (1) as claimed in one or more of the preceding claims, wherein said cutting modules comprise a transverse-cutting module (18) adapted to at least partly separate said plurality of transverse seals (53) into two parts. 15
6. A manufacturing process (1) as claimed in one or more of the preceding claims, wherein said sealing modules comprise a transverse-sealing module (16) for carrying out a plurality of transverse seals (53) substantially perpendicular to said feeding trajectory (11). 20
7. A packaging machine (10) adapted to make a plurality of bags (50), each of said bags (50) defining a filling volume (50a) containing a product, said packaging machine (10) being **characterised in that** it comprises: directional guide means (14) adapted to move at least one continuous sheet (51) along a feeding trajectory (11), said continuous sheet defining a front portion (51 a) and a back portion (51 b) of said plurality of bags (50), a plurality of operating modules (12) including: a longitudinal-sealing module (15) for carrying out a plurality of longitudinal seals (52) substantially parallel to said feeding trajectory (11) and adapted to join said back portion (51 b) to said front portion (51a), a transverse-sealing module (16) for carrying out a plurality of transverse seals (53) substantially perpendicular to said feeding trajectory (11) and adapted to define said filling volumes (50a), a filling module (19) adapted to introduce said product into said filling volume (50a), a longitudinal-cutting module (17) adapted to at least partly separate said plurality of longitudinal seals (52) into two parts, a transverse-cutting module (18) for at least partly separating said plurality of transverse seals (53) into two parts, an electric panel (20) for operating said packaging machine (10) and adapted to be electrically connected to said operating modules (12), a base structure (21) to which said operating modules (12) and control panel (20) are 25
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secured,
and **in that** it is made following the manufacturing process (1) according to one or more of the preceding claims.

8. A packaging machine (10) as claimed in the preceding claim, wherein the base structure (21) defines two distinct regions: a front region (26) and a rear region (25).

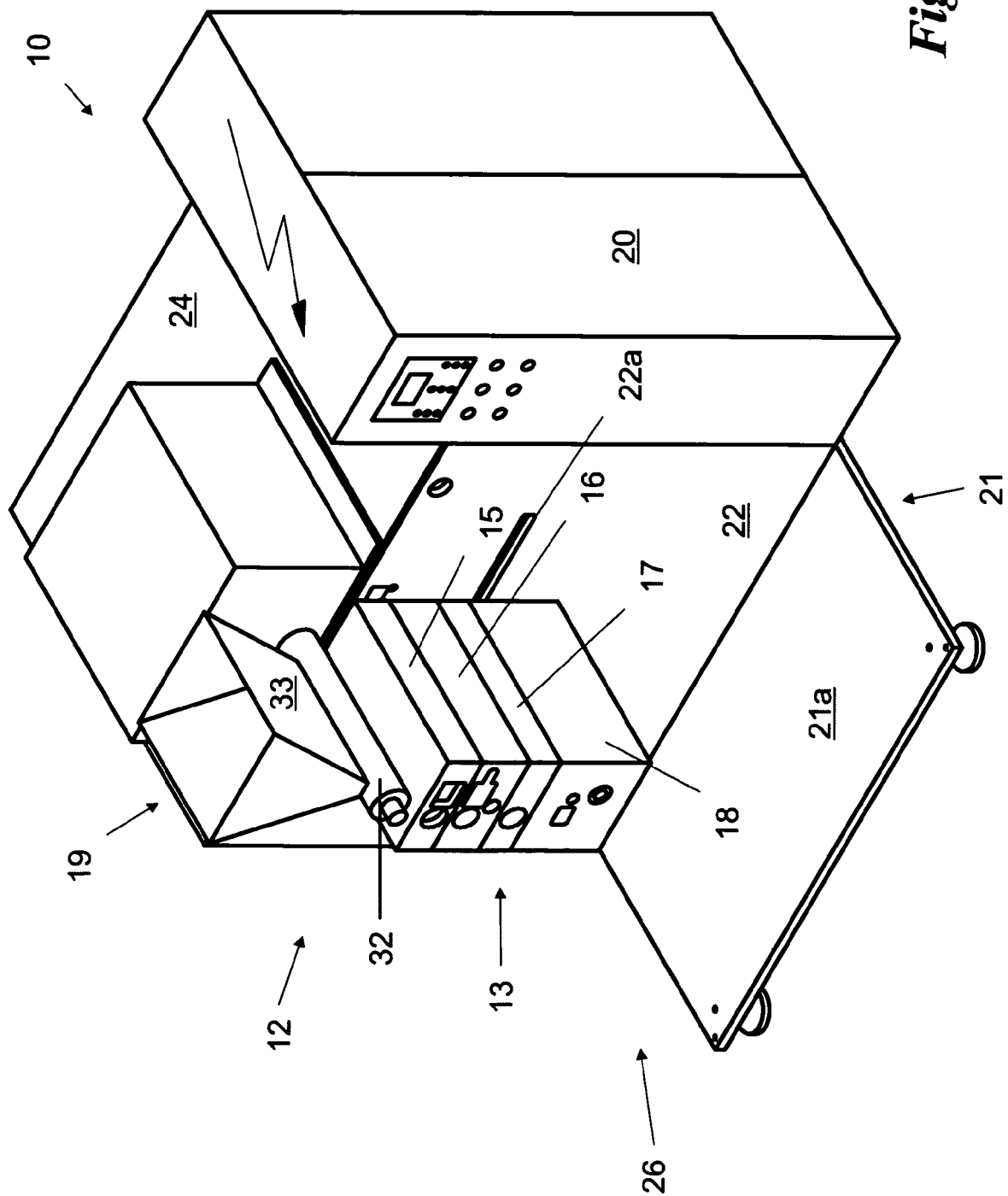


Fig. 1

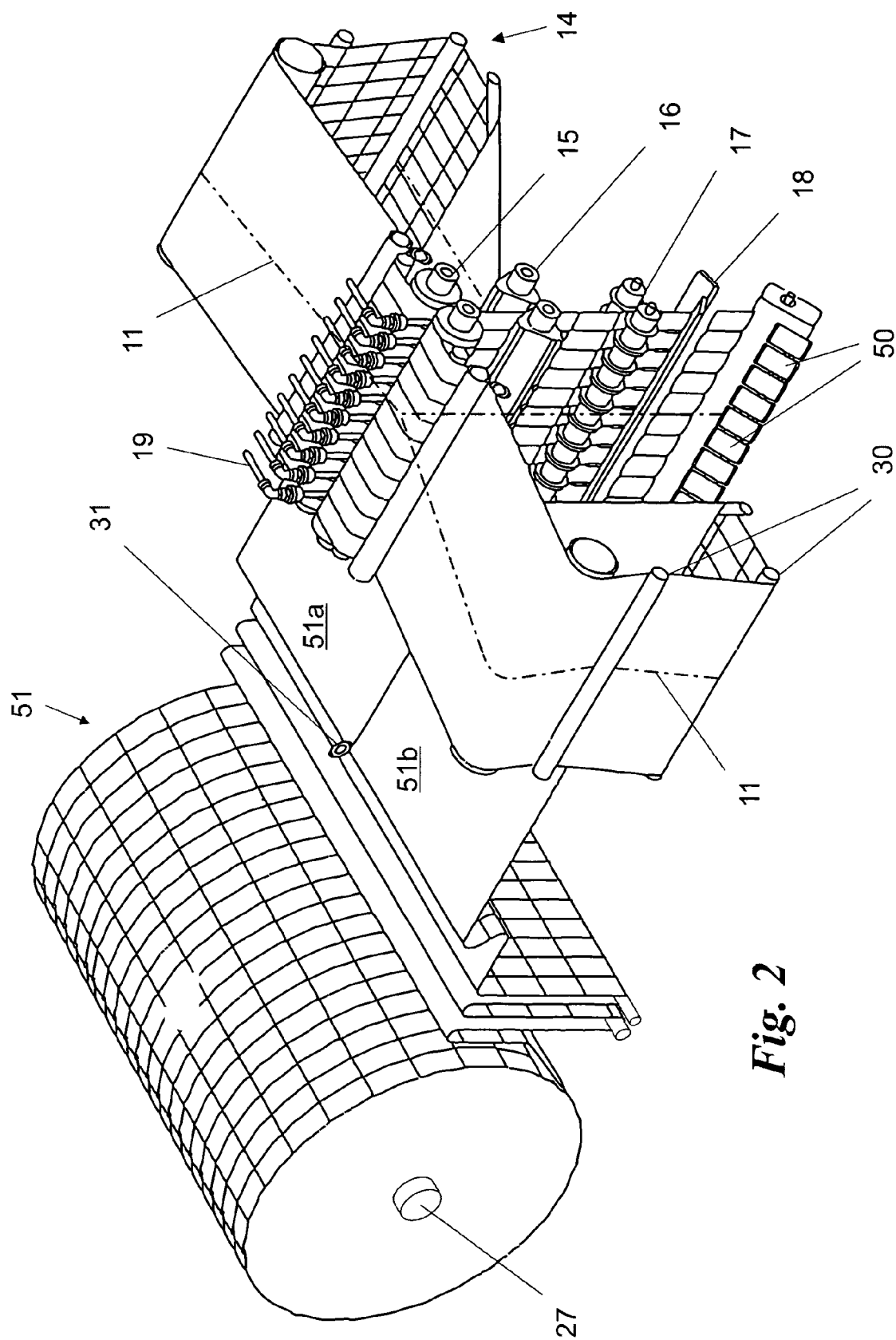
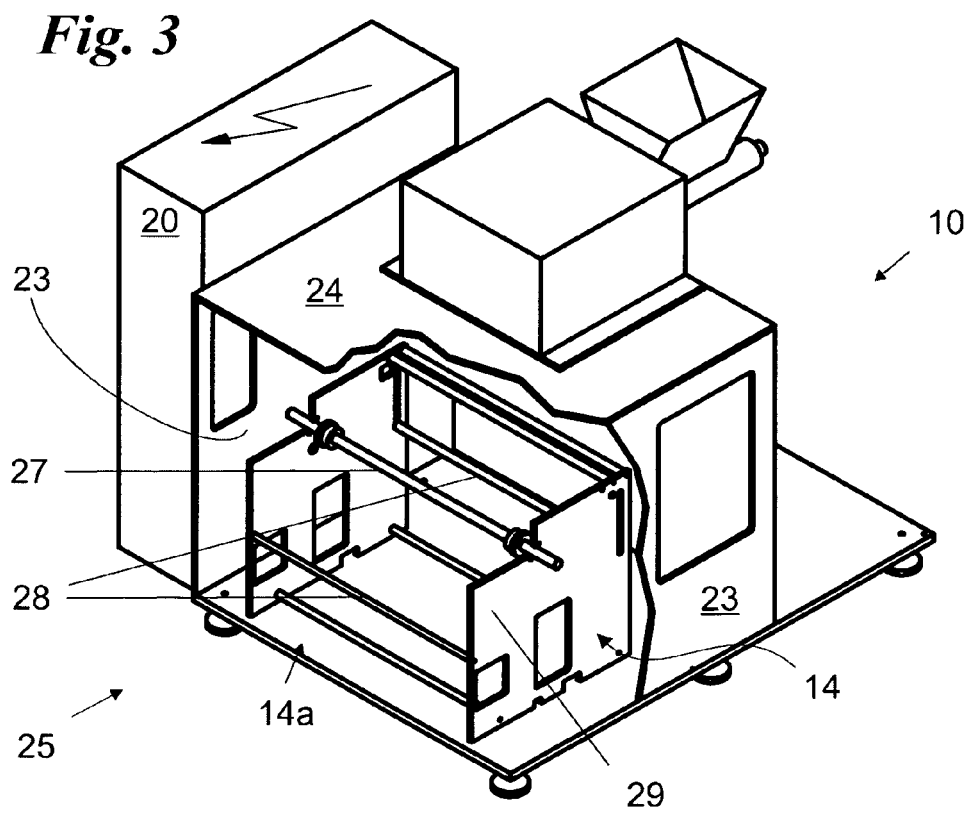
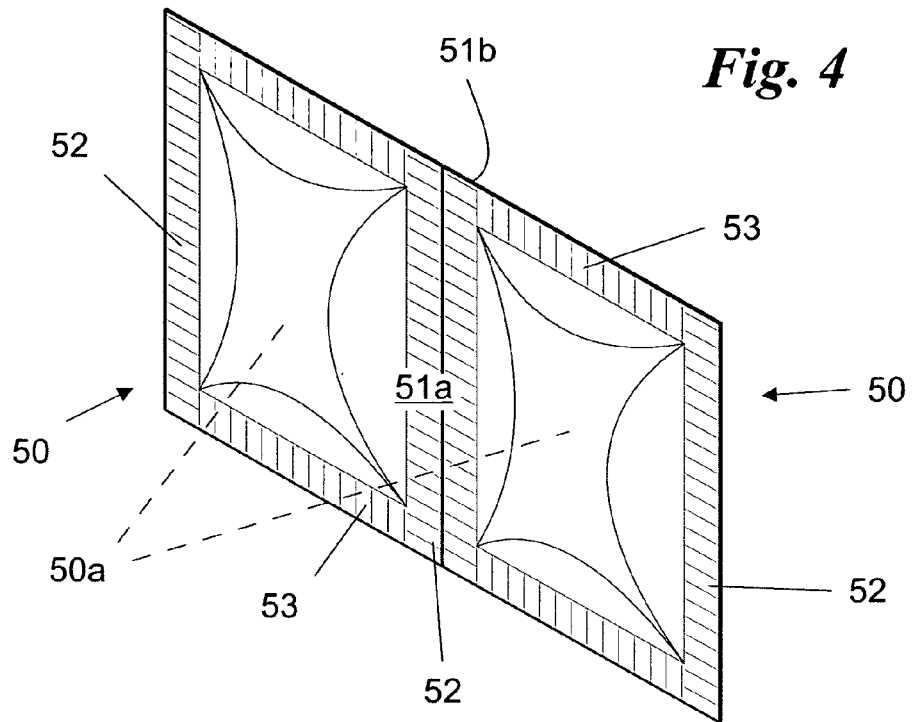


Fig. 2



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Fig. 5

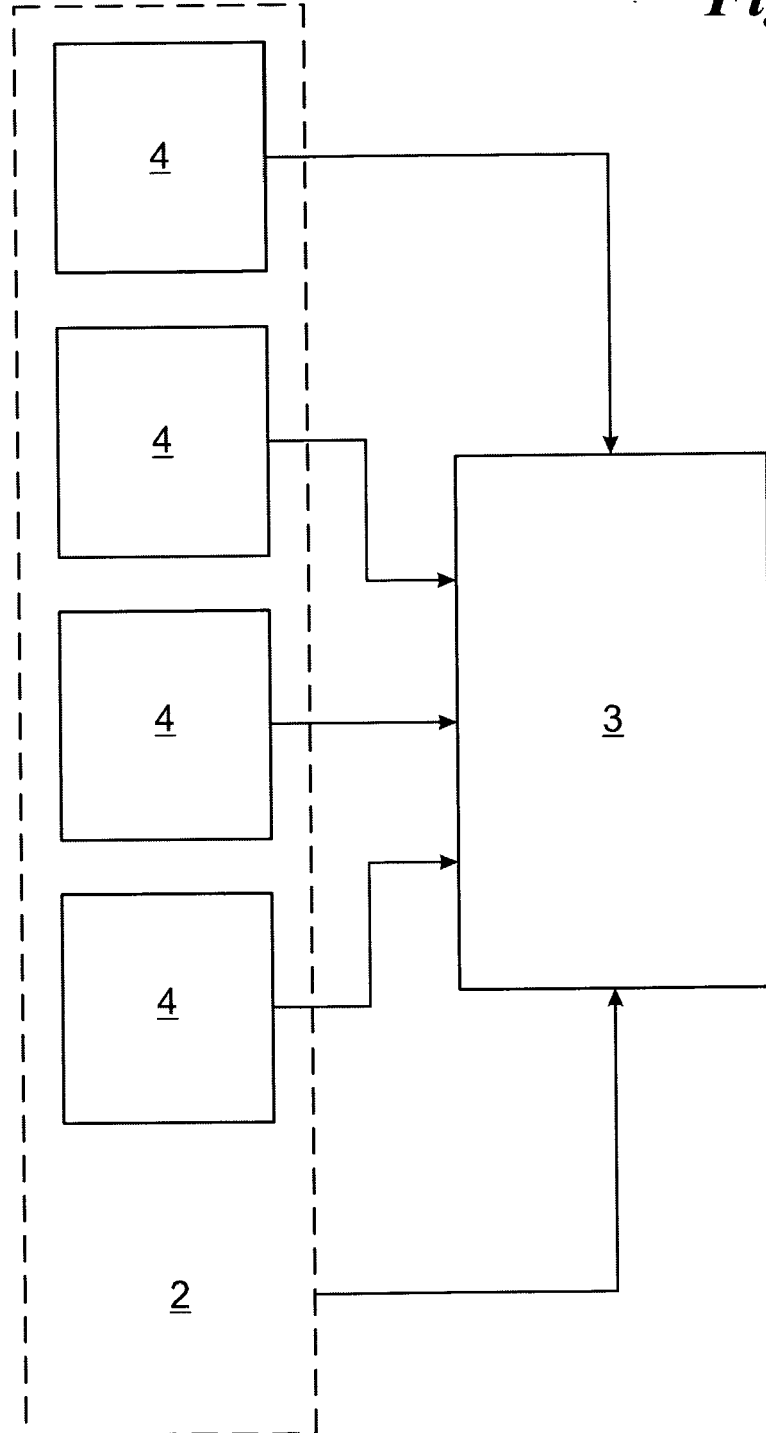
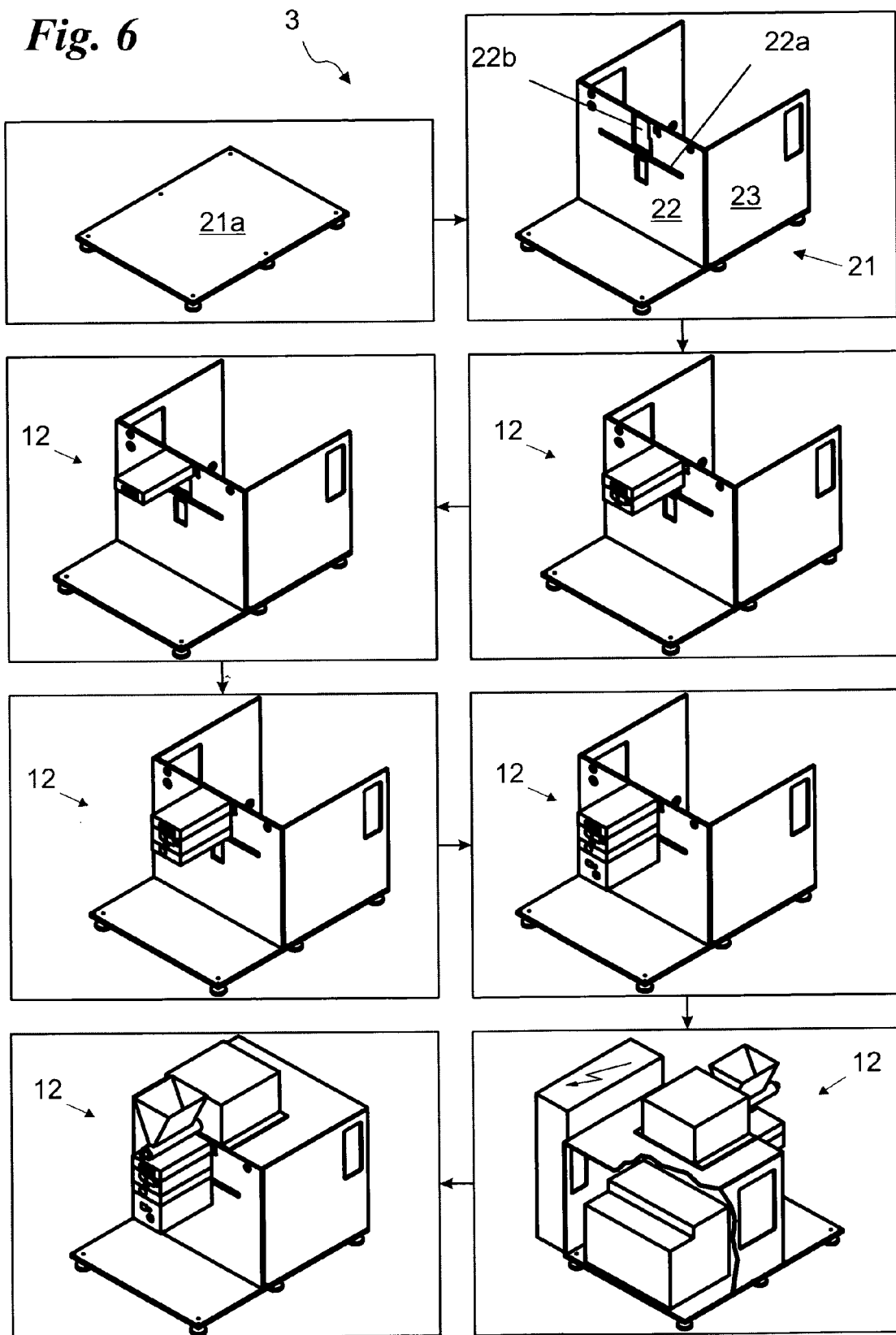


Fig. 6





EUROPEAN SEARCH REPORT

Application Number
EP 10 42 5220

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 3 054 236 A (STROOP JOHN H) 18 September 1962 (1962-09-18) * the whole document *	1-8	INV. B65B9/02 B65B59/04
Y	US 4 012 888 A (NICHOLS MATTHEW) 22 March 1977 (1977-03-22) * column 5, line 10 - line 30; figures 12,13 *	1-8	
A	US 3 000 157 A (HONORE OLLIER JACQUES GASPARD ET AL) 19 September 1961 (1961-09-19) * column 3, line 38 - line 47; figure 2 *	1	
A	DE 203 05 759 U1 (FINNAH ENGINEERING UND PACKAGI [DE]) 19 August 2004 (2004-08-19) * claims 1,2; figures 1,2 *	1	
A	DE 10 2006 045292 A1 (EMIL PESTER GMBH [DE]) 10 April 2008 (2008-04-10) * the whole document *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
Place of search		Date of completion of the search	Examiner
Munich		26 September 2011	Schelle, Joseph
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 10 42 5220

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26-09-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3054236	A	18-09-1962	BE 586472 A1	03-05-1960
			FR 1245208 A	04-11-1960
US 4012888	A	22-03-1977	NONE	
US 3000157	A	19-09-1961	NONE	
DE 20305759	U1	19-08-2004	NONE	
DE 102006045292 A1		10-04-2008	NONE	

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