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

(11) EP 2 527 106 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.11.2012 Bulletin 2012/48

(51) Int Cl.:
B27D 1/04 *(2006.01)* ***B65H 29/34*** *(2006.01)*

(21) Application number: **12168962.4**

(22) Date of filing: **22.05.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **24.05.2011 IT MI20110932**

(71) Applicant: **Angelo Cremona S.P.A.**
20900 Monza (MB) (IT)

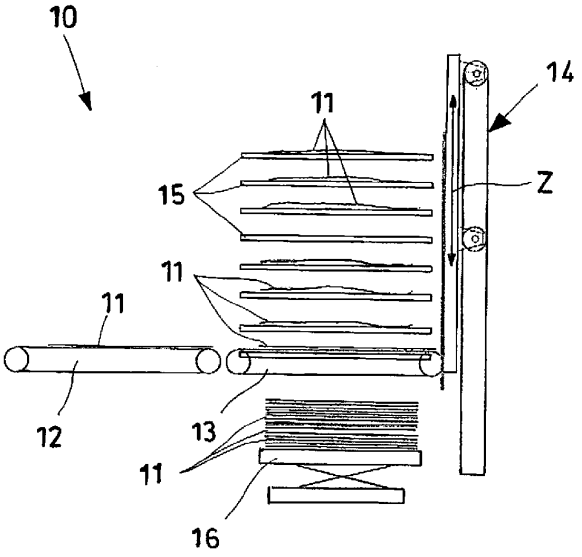
(72) Inventor: **Botti, Camillo**
26022 CASTELVERDE (CR) (IT)

(74) Representative: **Lotti, Giorgio et al**
Barzanò & Zanardo Milano S.p.A.
Via Borgonuovo, 10
20121 Milano (IT)

(54) Assembly and method for realizing multilayer panels

(57) Assembly (10) for realizing multilayer panels consisting of a plurality of sheet elements (11) arranged one on the other among them, said assembly (10) comprising a transfer belt (12) of said sheet elements (11) fed in succession one after the other, a loading belt (13) from one end for receiving said sheet elements (11) one after the other from said transfer belt (12), and from another end for positioning said sheet elements (11) one after the other on at least a rack structure (14, 14', 14"), said rack structure comprising a plurality of planes for receiving (15) said sheet elements (11), said planes being independently mobile on said rack structure in the vertical direction (Z), in order to permit the loading of a single sheet element (11) on a receiving plane (15), and synchronously in horizontal direction (Y, X) to permit the simultaneous unloading of said sheet elements (11) one on the other on a receiving element (16, 17).

Fig.5



EP 2 527 106 A1

Description

[0001] The present invention refers to an assembly and to a method for realizing multilayer panels of three or more layers.

[0002] By the term multilayer panel we mean an element that is obtained by placing over one another and gluing thin sheet elements, usually made from wood.

[0003] Currently, there are different apparatuses that are suitable for placing the sheet elements on top of one another.

[0004] The purpose of the present invention is that of making an assembly and a method for realizing multilayer panels that is capable of automating the operations of preparing the panel, in an extremely simple, cost-effective and particularly functional manner.

[0005] Another purpose is that of making an assembly and a method for realizing multilayer panels that are an alternative to existing apparatuses. These purposes, according to the present invention, are achieved by making an assembly and a method for realizing multilayer panels as outlined in claim 1.

[0006] Further characteristics of the invention are highlighted by the dependent claims.

[0007] The characteristics and the advantages of an assembly and method for realizing multilayer panels according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, with reference to the attached schematic drawings, in which:

- figures from 1 to 6 show schematic side views of various operative phases of a first embodiment of an assembly for realizing multilayer panels according to the present invention;
- figure 7 shows a side schematic view of a second embodiment of an assembly for realizing multilayer panels according to the present invention; and
- figures 8 and 9 show front schematic views of various operative phases of a third embodiment of an assembly for realizing multilayer panels according to the present invention.

[0008] With reference to the figures, reference numeral 10 shows an embodiment of an assembly for realizing multilayer panels according to the present invention, in which such multilayer panels are of the type comprising a plurality of sheet elements arranged one on the other.

[0009] Such an assembly 10 comprises, in succession from upstream to downstream following the flow of the sheet elements 11, a transfer belt 12, on which the sheet elements 11 are fed in succession one after the other, a loading belt 13 and at least one rack structure 14, 14', 14".

[0010] According to the present invention, such sheet elements 11 are previously provided with glue on their upper surface.

[0011] According to the invention, the rack structure 14, 14', 14" is of the type comprising a plurality of mobile receiving planes 15 that are suitable for receiving the single sheet elements 12 that are provided on their tops with glue.

[0012] In particular, such planes 15 are independently mobile on the rack structure in the vertical direction Z, in order to permit the loading of a single sheet element 12 on every receiving plane 15, and synchronously in the horizontal direction Y, X so as to permit, in collaboration with a fixed abutment element 22, the simultaneous unloading of all sheet elements 12 one on the other on a receiving element 16, 17.

[0013] In particular, the receiving element can be an unloading belt element 17 or a fixed table element 16. Upstream of the transfer belt 12, belts with mobile barriers or other means for aligning and placing the sheet elements one behind the other, can be provided. According to what has been shown in the figures, the rack structure 14, 14', 14" comprises the aforementioned fixed abutment element 22, a vertical support 20 and a mobile support 21 that can slide along the vertical support 20.

[0014] In such a case, the receiving planes 15 are independently assembled mobile in the vertical direction Z on the mobile support 21.

[0015] As mentioned at the beginning of the description, the planes 15 are synchronously mobile in the horizontal direction Y, X to permit, in collaboration with a fixed abutment element 22, the simultaneous unloading of all the sheet elements 12 one on the other on a receiving element 16, 17.

[0016] Such a movement along the horizontal direction Y, X can be generated by the movement of the vertical support 20 or by a relative movement of the receiving planes 15 as regards the vertical support 20.

[0017] Synchronously with the movement along the horizontal direction Y, X of the planes 15, also the loading belt 13 can be mobile in approaching or in withdrawing as regards the rack structure 14, 14', 14", so as to realize a passage area for the sheets 11 falling vertically.

[0018] Such an embodiment is shown in figure 6.

[0019] According to two different embodiments, the assembly 10 according to the present invention can comprise a single rack structure 14 arranged downstream of the loading belt 13.

[0020] In such a case, the receiving planes 15 are of the type that are synchronously mobile in the horizontal direction parallel X to the transfer direction of the sheet elements 11.

[0021] This embodiment is schematically shown in figure 7. Alternatively, the assembly 10 comprises two rack structures 14' 14" arranged facing one another laterally to the loading belt 13.

[0022] In such a case, the receiving planes 15, synchronously mobile between the two rack structures 14' 14", are mobile in the horizontal direction orthogonal Y to the transfer direction of the sheet elements 11.

[0023] Such a last embodiment is schematically shown in figures 8 and 9.

[0024] In order to permit interaction of the receiving

planes 15 with the loading belt 13 and the abutment element 22, such components are shaped so as to compenetrate and move freely according to the movements previously described.

[0025] For example, the loading belt 13, just like the abutment element 22, can comprise some sliding slots and the receiving planes 15 can be comb-shaped matching such slots.

[0026] It should be very easy to understand how the assembly and method for realizing multilayer panels object of the invention operates.

[0027] Figures 1 to 5 schematically show the operative phases of the assembly 10 according to the present invention for realizing multilayer panels consisting of a plurality of sheet elements 11 arranged among them one on the other.

[0028] In particular, such an assembly implements the phases of:

a) transferring on a transfer belt 12 the sheet elements 11 in succession one after the other,
b) feeding such sheet elements 11 from the transfer belt 12 to a loading belt 13;
c) arranging the sheet elements 12 one after the other from the loading belt 13 on at least a rack structure 14, 14', 14" comprising a plurality of mobile receiving planes 15;
d) moving such receiving planes 15 independently in the vertical direction Z in order to permit the loading of a single sheet element 12 on a receiving plane 15.

[0029] The phases stated to this point are shown in figures 1-5 in which the entire rack structure 14 is loaded.

[0030] Once the desired number of sheets 11 arranged on the planes 15 has been reached, the receiving planes 15 can be moved synchronously in the horizontal direction Y, X so as to permit, in collaboration with an abutment element 22, the simultaneous unloading of the sheet elements 11 one on the other on a receiving element 16, 17.

[0031] Such a phase of moving the receiving planes 15 synchronously in the horizontal direction Y, X can occur in two ways, or rather moving the planes along the horizontal direction X parallel to the flow of the sheets 11, as shown in figure 7, or along the horizontal direction Y orthogonal to the flow of the sheets 11, as shown in figures 8 and 9.

[0032] Such movements of the receiving planes 15 in the horizontal direction Y, X can occur by moving the support 20 or, keeping such a support still, by relative movement of the planes 15.

[0033] It has thus been seen that an assembly and a method for realizing multilayer panels according to the present invention achieve the purposes previously highlighted. Indeed, the assembly for realizing multilayer panels of the present invention implements an advantageous alternative to existing apparatuses.

[0034] The assembly and method for realizing multilayer panels of the present invention thus conceived can undergo numerous modifications and variants, all covered by the same inventive concept; moreover, all the details can be replaced by technically equivalent elements. In practice, the materials used, as well as their sizes, may be any type according to the technical requirements.

Claims

1. Assembly (10) for realizing multilayer panels consisting of a plurality of sheet elements (11) arranged one on the other among them, said assembly (10) comprising a transfer belt (12) of said sheet elements (11) fed in succession one after the other, a loading belt (13) from one end for receiving said sheet elements (11) one after the other from said transfer belt (12), and from another end for positioning said sheet elements (11) one after the other on at least a rack structure (14, 14', 14"), said at least rack structure (14, 14', 14") comprising a plurality of planes for receiving (15) said sheet elements (11), said planes being independently mobile on said rack structure in the vertical direction (Z), in order to permit the loading of a single sheet element (11) on a receiving plane (15), and synchronously in the horizontal direction (Y, X) to permit the simultaneous unloading of said sheet elements (11) one on the other on a receiving element (16, 17).

2. Assembly (10) according to claim 1 **characterized in that** said at least rack structure (14, 14', 14") comprises a fixed abutment element (22), a vertical support (20) and a mobile support (21) along said fixed vertical support (20), said receiving planes (15) being from one end independently assembled on said mobile support (21) in the vertical direction (Z).

3. Assembly (10) according to claim 2 **characterized in that** said vertical support (20) is mobile in the horizontal direction (Y, X).

4. Assembly (10) according to claim 2 **characterized in that** said vertical support (20) is fixed and in the horizontal direction (Y, X) and said receiving planes (15) are synchronously mobile in the horizontal direction (Y, X) as regards said vertical support (20).

5. Assembly (10) according to any of the preceding claims **characterized in that** said loading belt (13) is mobile in approaching or in withdrawing as regards said at least a rack structure (14, 14', 14").

6. Assembly (10) according to any of the preceding claims **characterized in that** it comprises a rack structure (14) placed downstream of said loading belt (13), said receiving planes (15) being synchronously mobile in the horizontal direction parallel (X) to the

transfer direction of said sheet elements (11).

7. Assembly (10) according to any of the claims from 1 to 5 **characterized in that** it comprises two rack structures (14', 14") placed laterally to said loading belt (13), said receiving planes (15) being synchronously mobile in the horizontal direction orthogonal (Y) to the transfer direction of said sheet elements (11).

8. Assembly (10) according to any of the preceding claims **characterized in that** said receiving planes (15) are at least partially contained inside said loading belt (13).

9. Method for the realization of multilayer panels consisting of a plurality of sheet elements (11) among them arranged one on the other comprising the phases of:

a) transferring on a transfer belt (12) said sheet elements (11) fed in succession one after the other;
b) feeding sheet elements (11) one after the other from said transfer belt (12) to said loading belt (13);
c) arranging said sheet elements (11) one after the other on at least a rack structure (14, 14', 14") comprising a plurality of mobile receiving planes (15);
d) moving said receiving planes (15) independently in the vertical direction (Z) to permit the loading of a single sheet element (11) on a receiving plane (15);
e) moving said receiving planes (15) synchronously in the horizontal direction (Y, X) to permit the simultaneous unloading of said sheet elements (11) one on the other on a receiving element (16, 17).

10. Method according to claim 9 **characterized in that** it also comprises the phase of moving said loading belt (13) in approaching or in withdrawing as regards said at least a rack structure (14, 14', 14").

Fig.2

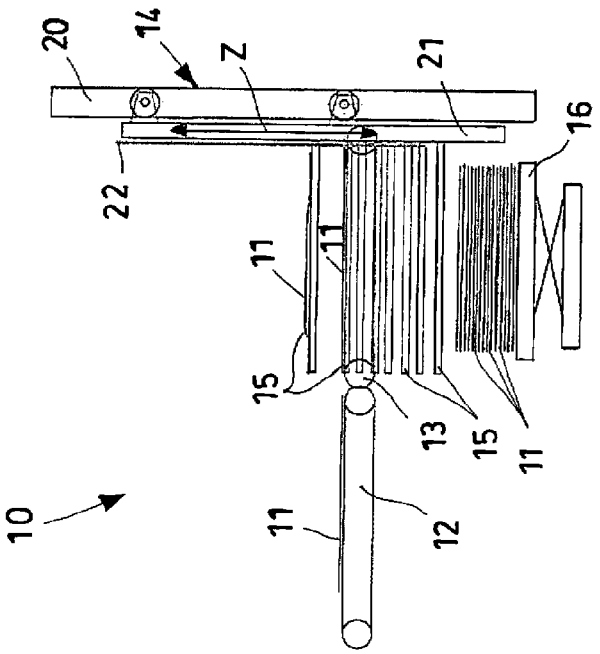

20
14
Z
21
16
22
11
11
15
13
15
11
10
11
12

Fig.1

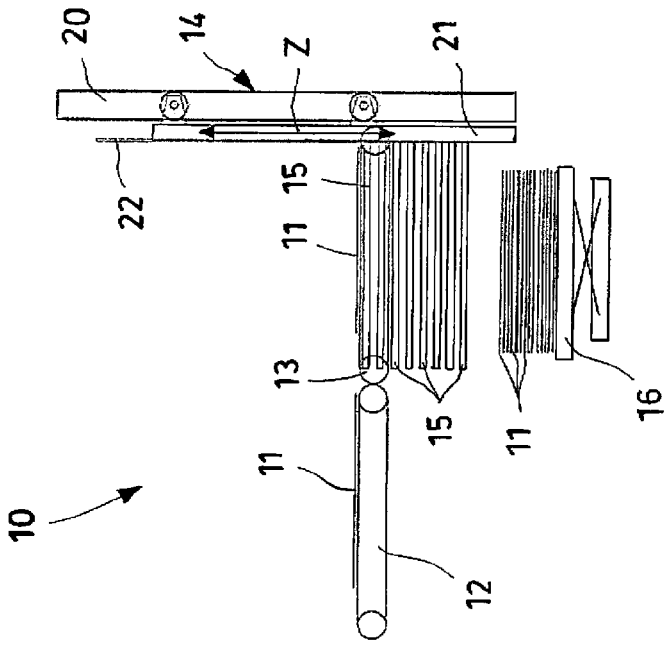

20
14
Z
21
22
15
11
13
15
11
16
10
11
12

Fig.4

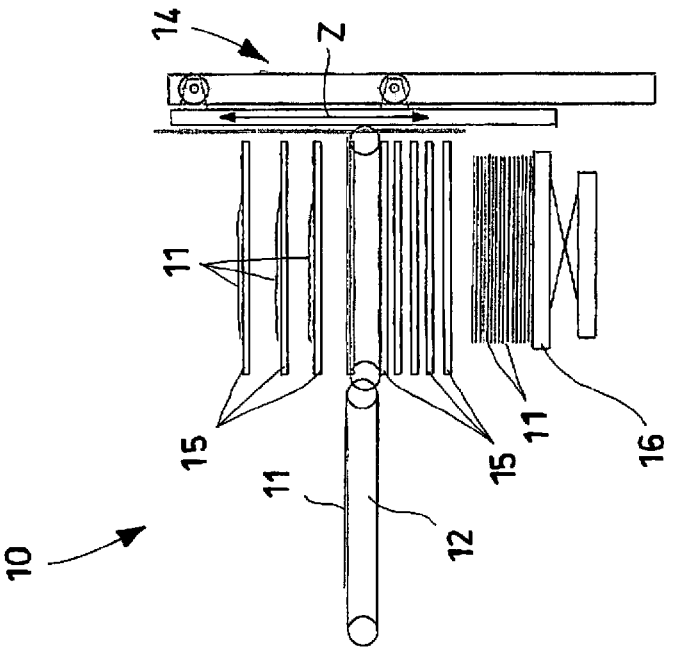


Fig.3

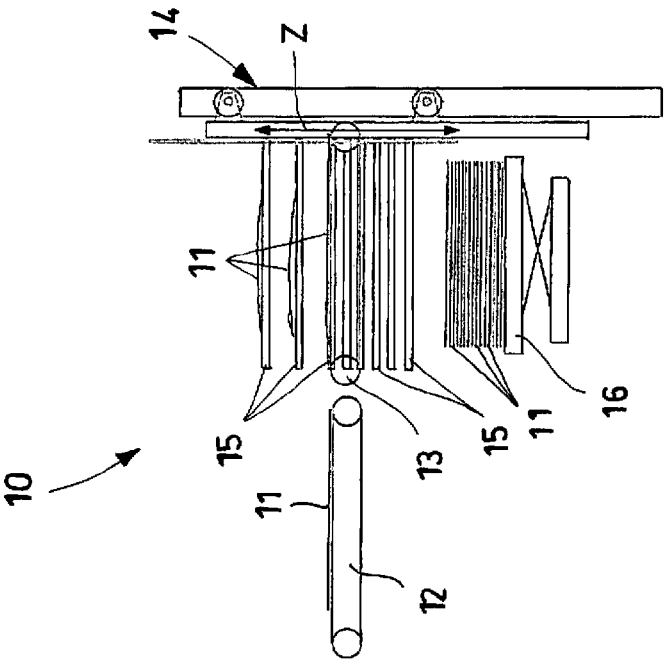


Fig.6

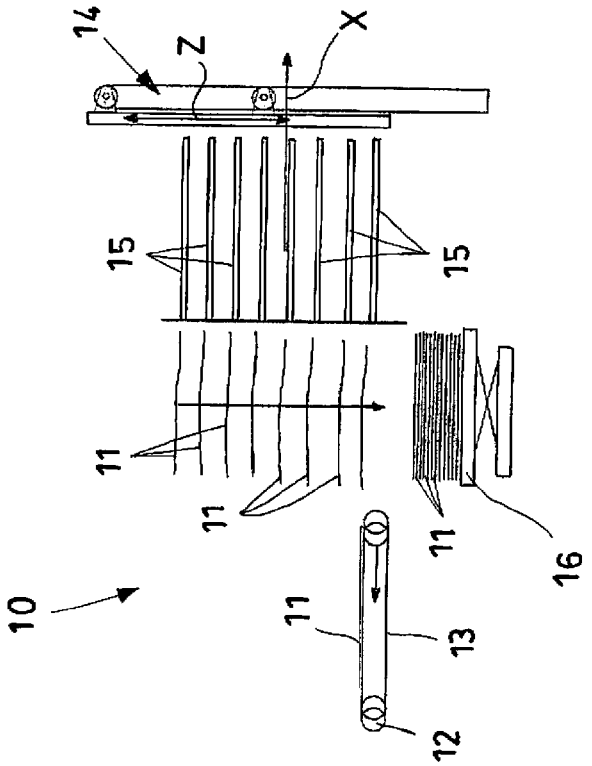


Fig.5

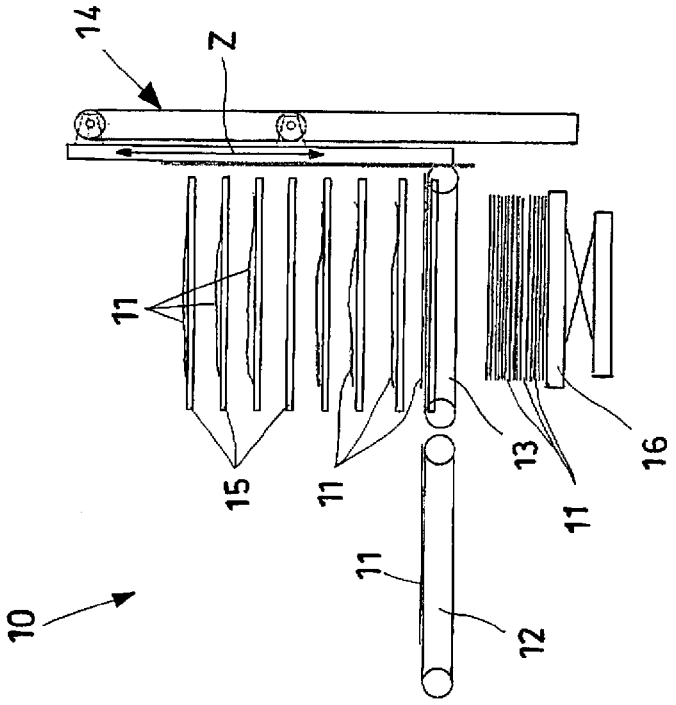


Fig.7

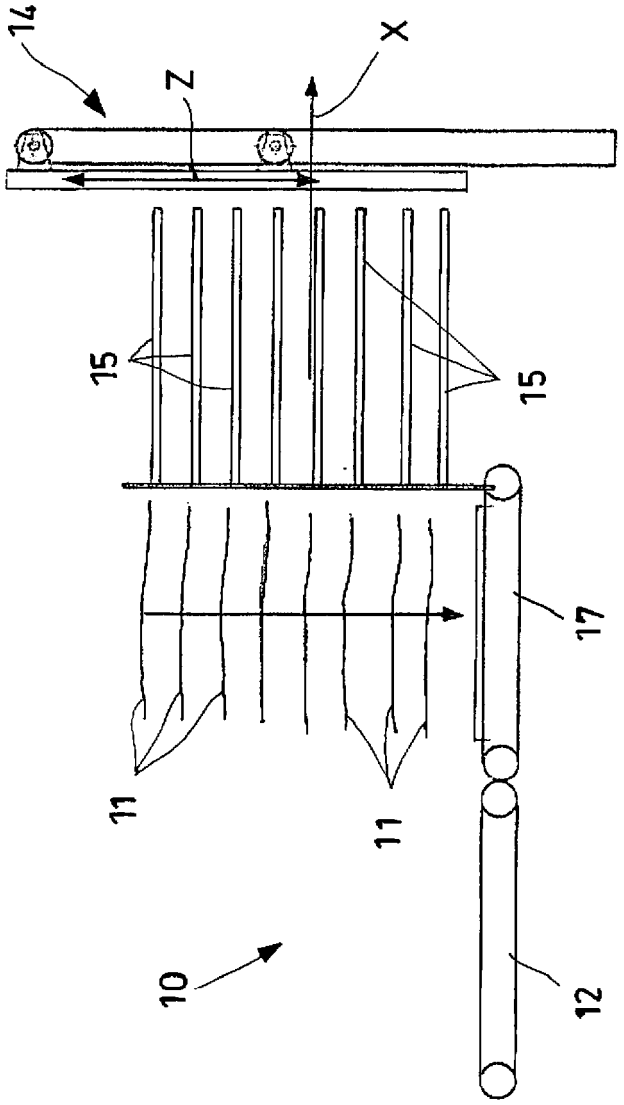


Fig.9

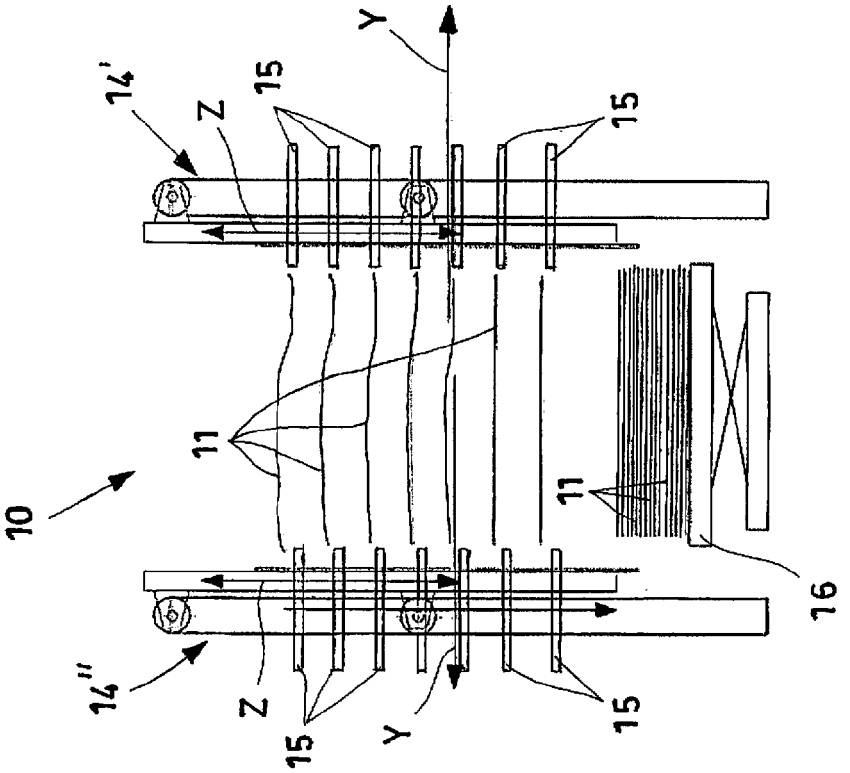
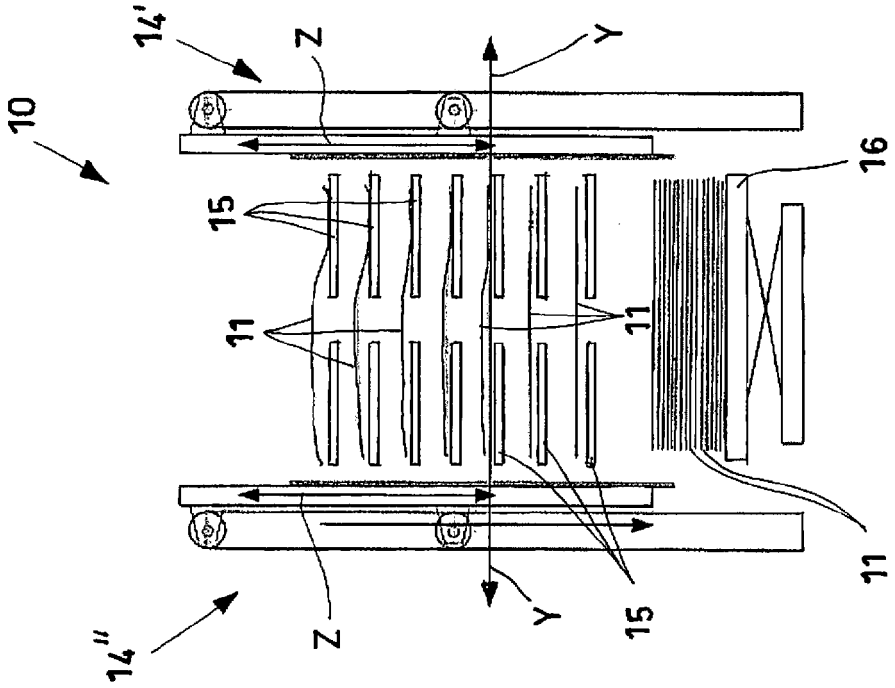


Fig.8



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 12 16 8962

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 785 508 A (HAYDEN R) 15 January 1974 (1974-01-15) * the whole document * -----	1,9	INV. B27D1/04 B65H29/34
A	US 4 144 112 A (HASEGAWA KATSUJI) 13 March 1979 (1979-03-13) * the whole document * -----	1,9	
A	DE 10 2004 007543 A1 (KIRSCH REINER [DE]) 1 September 2005 (2005-09-01) * the whole document * -----	1,9	
			TECHNICAL FIELDS SEARCHED (IPC) B27D B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 July 2012	Huggins, Jonathan

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

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 12 16 8962

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 785 508 A (HAYDEN R) 15 January 1974 (1974-01-15) * the whole document * -----	1,9	INV. B27D1/04 B65H29/34
A	US 4 144 112 A (HASEGAWA KATSUJI) 13 March 1979 (1979-03-13) * the whole document * -----	1,9	
A	DE 10 2004 007543 A1 (KIRSCH REINER [DE]) 1 September 2005 (2005-09-01) * the whole document * -----	1,9	

TECHNICAL FIELDS SEARCHED (IPC)

B27D
B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 July 2012	Huggins, Jonathan

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 16 8962

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-07-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3785508 A	15-01-1974	NONE	
US 4144112 A	13-03-1979	NONE	
DE 102004007543 A1	01-09-2005	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82