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(54) **A SYSTEM AND METHOD FOR CREATION OF LOAD UNITS**

SYSTEM UND VERFAHREN ZUR HERSTELLUNG VON LASTEINHEITEN

SYSTEME ET PROCEDE DE CREATION D'UNITES DE CHARGEMENT

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**Description**Technical Field

**[0001]** The present invention concerns a system for load unit creation, and more specifically a system based on two or more stations used to form the load units. Each load unit is formed of two or more separate packages.

Prior Art

**[0002]** Today it is common to use pallets of various forms and sizes as a base for different load units. Often so called EUR pallets made of wood are used. The pallets as such take up a relatively large place in storing, are heavy and may be cumbersome to handle. Furthermore, the EUR pallets are normally reused, which means that they often are returned without carrying any load. In order to avoid the drawbacks with the previously used systems based on EUR pallets or other forms of pallets it has been suggested that two or more smaller, separate loading members or loading ledges may be used instead of EUR pallets or other pallets.

**[0003]** US 4 986 726 shows a plant for stacking panels, i.e. flat objects, on wooden pallets. The panels are sorted depending on their size and stacking requirements. WO 02/34781 (PCT/DK01/00748) shows L-shaped loading members forming feet of one single box. The loading members are used to ensure that the forks of a fork-lift truck can be inserted beneath the box.

Summary of the Invention

**[0004]** As the use of loading ledges has increased, the need of a suitable system and method for creation of separate loading units has been felt.

**[0005]** The system and method for creation of load units should preferably fulfill a number of demands. Thus, one object is that the system and method should be relatively easy to adapt to different situations, both concerning the level of automation and the form and size of the packages forming each load unit.

**[0006]** A further object is that the system and method should be possible to form, to run and maintain at a reasonable cost.

**[0007]** Still a further object is that the system and method should function with different transport means.

**[0008]** According to the present invention a system for load unit creation is established. Said system comprises two or more stations for forming the load units. In a method using said system a first station is used to connect and place two or more packages to form the bottom layer of a suitable load unit. In further, at present preferred stations, loading ledges are placed on the load units and one or more straps and/or stretch wrapping are wound around the load units.

**[0009]** Further objects and advantages with the present invention will be obvious for a person skilled in

the art when reading the detailed description below of presently preferred embodiments.

Brief Description of the Drawings

**[0010]** The invention will be described further below, by way of an example and with reference to the enclosed drawings. In the drawings:

10 Figs. 1a to li show different load units formed by using the present invention;

Fig. 2 shows a part of the system for creating load units according to the present invention; and

15 Fig. 3 shows one embodiment of the system of the present invention in a schematic way.

Detailed description of Preferred Embodiments

**[0011]** The system and method of the present invention is based on the presumption that packages 1 of different sizes and shapes are used to form load units 4. Even though the shown packages 1 all are of a general rectangular form, a person skilled in the art realises that it is possible to form load units 4 of packages having other  
20 general forms.

**[0012]** The present invention is based on the use of several stations 8-10, in which the load units 4 are successively formed. In a first station 8 one or more packages 1 are collected and placed in the form of each desired final load unit 4. In a second station 9 at least one loading ledge 2 is placed at each of two opposite lower edges of the load unit 4. In a third and final station 10 straps 7 and/or stretch wrapping or the like are wound one or more turns around the load unit 4, including the loading ledges 2.  
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**[0013]** The loading ledges 2 used are normally of the kind described in PCT/DK01/00748 or any corresponding load members. The loading ledges 2 have a generally L-shaped cross section. The loading ledges 2 are to be placed at a lower edge of a package or the like, in such a way that one part of each loading ledge 2 is placed under the package and one part along the side of said package. The part of the loading ledge 2 to be placed under the packages has protrusions to allow a lifting and/or transport means to be slid in under the package.  
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**[0014]** If e.g. the load units 4 are to be formed of several small packages 1, there may be a need for further stations. Thus, such further stations may include stations where subunits each furnished with loading ledges 2 are formed. (See e.g. Figs. 1c and 1f.) The subunits may be furnished with straps, but it is normally not necessary. A number of subunits are then forward to a station for forming of the final load units 4. It is also possible to have different stations for straps 7 and stretch wrapping. As indicated in Figs. 1g and 1h a plate may be placed at the bottom of the load unit 4, if a large number of small packages 1 form the load unit 4.  
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**[0015]** A person skilled in the art realises that the pack-

ages 1 and load units, respectively, may be transported to and between said stations in many different ways. Furthermore, the different stations may be totally or partly manual and/or automatic. The expression "totally automatic", as used in this description, means that all actual handling of the packages 1 or load units 4 is done by a machine, robot or the like, which on the other hand may be driven automatically or be controlled by a person.

**[0016]** The packages 1 are normally stored in some kind of ware house. The first station 8 is normally placed in or adjacent the ware house or the like. In said first station 8 the appropriate number of packages 1 to form a load unit are collected. The load units 4 of the present invention may be formed of one single package 1 or by many packages 1. The desired size of the finished load units will govern the number of packages 1 used for each separate load unit 4.

**[0017]** In the embodiment of Fig. 2 the packages 1 forming the load unit 4 are collected on a conveyor 6. By means of the conveyor 6 the load units 4 are brought to the second station 9. In the second station 9 the load units 4 are received in a machine 5, in which each loading unit 4 is furnished with loading ledges 2, in a more or less automatic fashion. In other embodiments the loading ledges 2 are furnished in a more manual way (not shown). The loading unit 4 with loading ledges 2 is then transported away from the machine 5, by means of a further conveyor 6. A person skilled in the art realises that the form of the conveyors may vary, thus bands, belts, rollers, wheels etc. may be used. Furthermore, a person skilled in the art realises that the load units 4 may be transported to and from the machine 5 by any other suitable means, such as industrial trucks, cranes, traverses etc.

**[0018]** In the station 9 comprising the machine for addition of loading ledges 2, a suitable number of loading ledges 2 are added to the load units 4. In Fig. 1 it is schematically shown that depending on package size, the sensitivity of the contents etc. the number of loading ledges 2 on each side may vary and loading ledges may be placed on several different heights and widths in each loading unit 4.

**[0019]** After the machine 5 furnishing the load units 4 with loading ledges 2 the load units are brought to the third station 10. In said station 10 the load units are furnished with straps 7 and/or stretch wrapping or the like. Normally, a machine, well known in the art, is used to furnish the load units 4 with straps 7, stretch wrapping or the like. However, it is also possible to apply the straps 7, stretch wrapping or the like in a more manual way.

**[0020]** When the load units 4 leave the third station 10, they are ready for transport in any suitable way. Thus, the load units 4 are forward to a container, lorry, truck or any other means of transportation.

## Claims

1. A method for forming a load unit (4) in two or more

stations (8-10), **characterized in that** in a first station (8), a number of packages (1) are collected and placed to form a load unit (4) and **in that** the load units (4) formed in the first station (8) are furnished with at least two loading ledges (2) at opposing lower edges of the load unit (4) in a second station (9), wherein the number of loading ledges (2) used and their placement are based on the size and shape of the packages (1), which are to form the load unit (1) and wherein the bottom layer of the load unit (4) has two or more packages (1).

2. The method of claim 1, **characterized in that** one or more straps (7) and/or stretch wrapping is wound one or more turns around the load unit (4), including the loading ledges (2), in a third station (10).
3. The method of claim 1 or 2, **characterized in that** the finished load units (4) are forward to a container, lorry, truck or other means of transportation.
4. The method of any of the claims 1 to 3, **characterized in that** the sizes of the load units (4) are adapted to the size of a container, a truck, a lorry or the like, by which the load units (4) are to be shipped.
5. A system to be used in a method according to any of the previous claims, comprising two or more stations (8-10), in which the load units (4) are formed, **characterized in that** one station (8) has means for collecting a number of packages (1) and placing said packages (1) to form a desired load unit (4) wherein the bottom layer of the load unit (4) has two or more packages (1) and that another station (9) has means to furnish each load unit (4) with two or more loading ledges (2) on at least two opposing lower edges of the load units (4).
6. The system of claim 5, **characterized in that** the station (9) for furnishing each load unit with loading ledges (2) comprises a machine (5) for placing the loading ledges (2) at the load units (4).
7. The system of claim 5 or 6, **characterized in that** one station (10) has means to furnish each load unit (4) with one or more straps (7) and/or a stretch wrapping wound around the outside of the load unit (4), including the loading ledges (2).

## Patentansprüche

1. Verfahren zum Bilden einer Ladungseinheit (4) in zwei oder mehr Stationen (8-10), **dadurch gekennzeichnet, dass** in einer ersten Station (8) eine Anzahl von Paketen (1) zusammengestellt und platziert werden, um eine Ladungseinheit (4) zu bilden, und **dadurch**, dass in einer zweiten Station (9) die La-

- 5      dungseinheiten (4), die in der ersten Station (8) gebildet werden, mit wenigstens zwei Ladeleisten (2) an gegenüberliegenden unteren Kanten der Ladungseinheit (4) bestückt werden, wobei die Anzahl der verwendeten Ladeleisten (2) und deren Platzierung auf der Größe und der Form der Pakete (T) basiert, die die Ladungseinheit (1) bilden, und wobei die untere Schicht der Ladungseinheit (4) zwei oder mehr Pakete (1) hat.
- 10      2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** in einer dritten Station (10) ein oder mehrere Bänder (7) und/oder eine Stretch-Umwicklung in einem oder mehreren Umläufen um die Ladungseinheit (4) einschließlich der Ladeleisten (2) gewickelt wird.
- 15      3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die fertigen Ladungseinheiten (4) zu einem Behälter, Laster, Lastwagen oder einer anderen Transporteinrichtung befördert werden.
- 20      4. Verfahren nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Größen der Ladungseinheiten (4) an die Größe eines Containers, eines Lastwagens, eines Lasters oder dergleichen angepaßt sind, durch den die Ladungseinheiten (4) versandt werden.
- 25      5. System zur Verwendung in einem Verfahren nach einem der vorhergehenden Ansprüche, umfassend zwei oder mehr Stationen (8-10), in welchen die Ladungseinheiten (4) gebildet werden, **dadurch gekennzeichnet, dass** eine Station (8) eine Einrichtung zum Zusammenstellen einer Anzahl von Paketen (1) und Platzieren der Pakete (1) hat, um eine gewünschte Ladungseinheit (4) zu bilden, wobei die untere Schicht der Ladungseinheit (4) zwei oder mehr Pakete (1) hat, und dass eine weitere Station (9) eine Einrichtung hat, um jede Ladungseinheit (4) mit zwei oder mehr Ladeleisten (2) an wenigstens zwei gegenüberliegenden unteren Kanten der Ladungseinheit (4) zu bestücken.
- 30      6. System nach Anspruch 5, **dadurch gekennzeichnet, dass** die Station (9) zum Bestücken jeder Ladungseinheit mit Ladeleisten (2) eine Maschine (5) zum Platzieren der Ladeleisten (2) an den Ladungseinheiten (4) umfaßt.
- 35      7. System nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** eine Station (10) eine Einrichtung zum Bestücken jeder Ladungseinheit (4) mit einem oder mehreren Bändern (7) und/oder einer Stretch-Umwicklung hat, die um die Außenseite der Ladungseinheit (4) einschließlich der Ladeleisten (2) gewickelt wird.
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## Revendications

1. Procédé de formation d'une unité de chargement (4) dans deux ou plus de deux postes (8-10), **caractérisé en ce que**, dans un premier poste (8), un certain nombre de colis (1) sont collectés et placés pour former une unité de chargement (4) et **en ce que** les unités de chargement (4) formées dans le premier poste (8) sont pourvues d'au moins deux cornières (2) de chargement à des bords inférieurs opposés de l'unité (4) de chargement dans un deuxième poste (9), dans lequel le nombre de cornières (2) de chargement utilisées et leur positionnement sont basés sur la dimension et la forme des colis (1) qui doivent former l'unité de chargement (1), et dans lequel la couche inférieure de l'unité de chargement (4) comporte deux ou plus de deux colis (1).
2. Procédé selon la revendication 1, **caractérisé en ce qu'une** ou plusieurs sangles (7) et/ou une enveloppe étirée sur forme est enroulée sur un ou plusieurs tours autour de l'unité de chargement (4), y compris les cornières (2) de chargement, dans un troisième poste (10).
3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** les unités de chargement fini (4) sont avancées vers un conteneur, un wagon, un camion ou un autre moyen de transport.
4. Procédé selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** les dimensions des unités de chargement (4) sont conçues pour la dimension d'un conteneur, d'un camion, d'un wagon ou analogue, à l'aide duquel les unités de chargement (4) doivent être expédiées.
5. Système destiné à être utilisé dans un procédé selon l'une quelconque des revendications précédentes, comportant deux ou plus de deux postes (8-10), dans lesquels les unités de chargement (4) sont formées, **caractérisé en ce qu'un** poste (8) comporte un moyen destiné à collecter un certain nombre de colis (1) et à placer lesdits colis (1) pour former une unité de chargement souhaitée (4), dans lequel la couche inférieure de l'unité de chargement (4) comporte deux ou plus de deux colis (1) et **en ce qu'un** autre poste (9) comporte un moyen destiné à fournir à chaque unité (4) de chargement deux ou plus de deux cornières de chargement (2) sur au moins deux bords inférieurs opposés des unités de chargement (4).
6. Système selon la revendication 5, **caractérisé en ce que** le poste (9) de fourniture à chaque unité de chargement de cornières (2) de chargement comporte une machine (5) destinée à placer les cornières (2) de chargement sur les unités (4) de chargement.

7. Système selon la revendication 5 ou 6, **caractérisé en ce qu'**un poste (10) comporte un moyen destiné à fournir à chaque unité de chargement (4) une ou plusieurs sangles (7) et/ou une enveloppe étirée sur forme entourant l'extérieur de l'unité (4) de chargement, y compris les cornières (2) de chargement.

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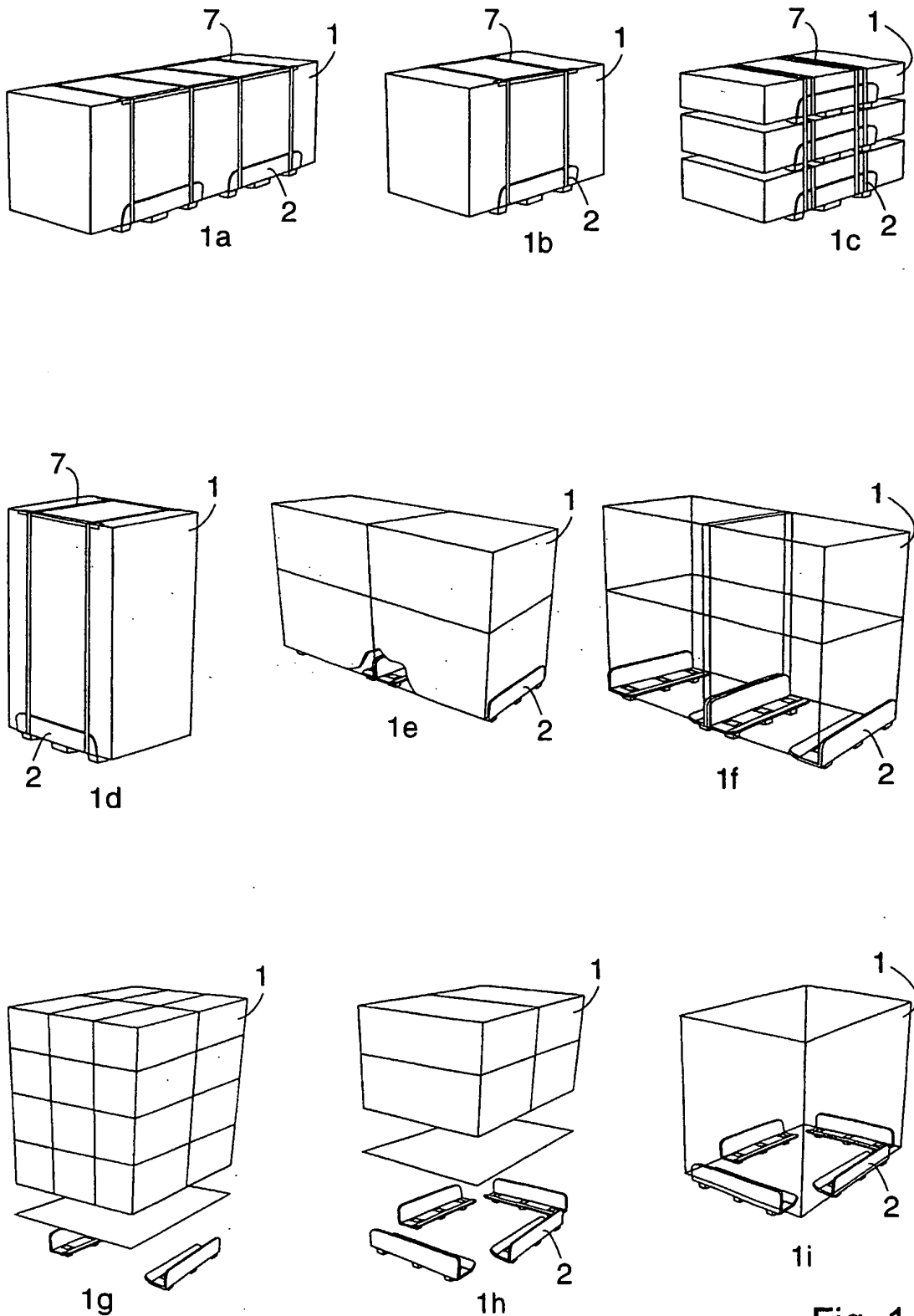
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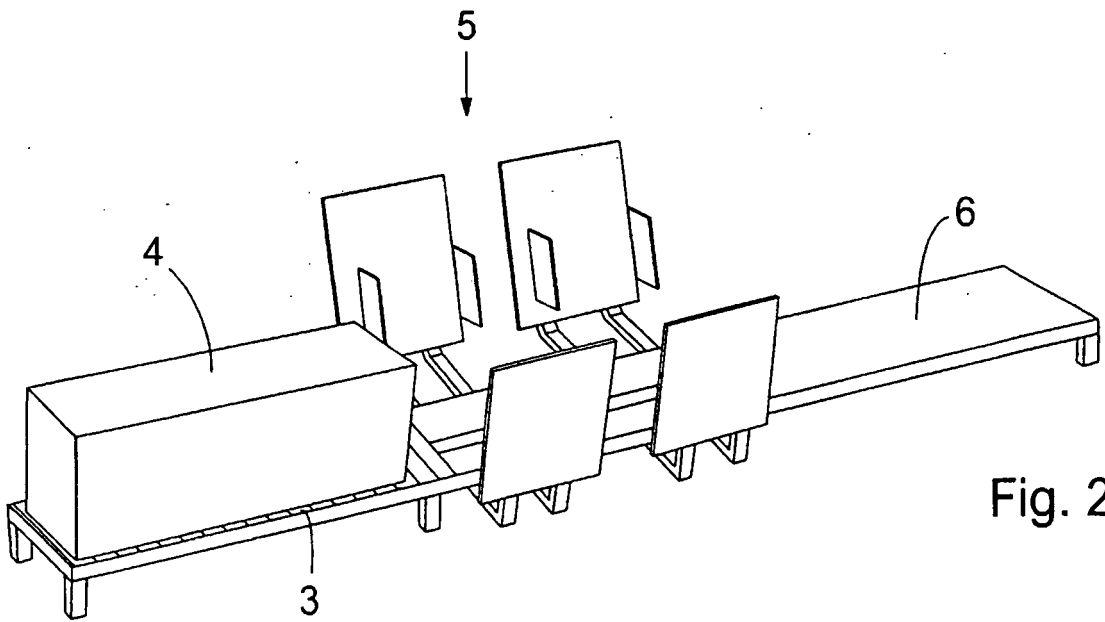


Fig. 2

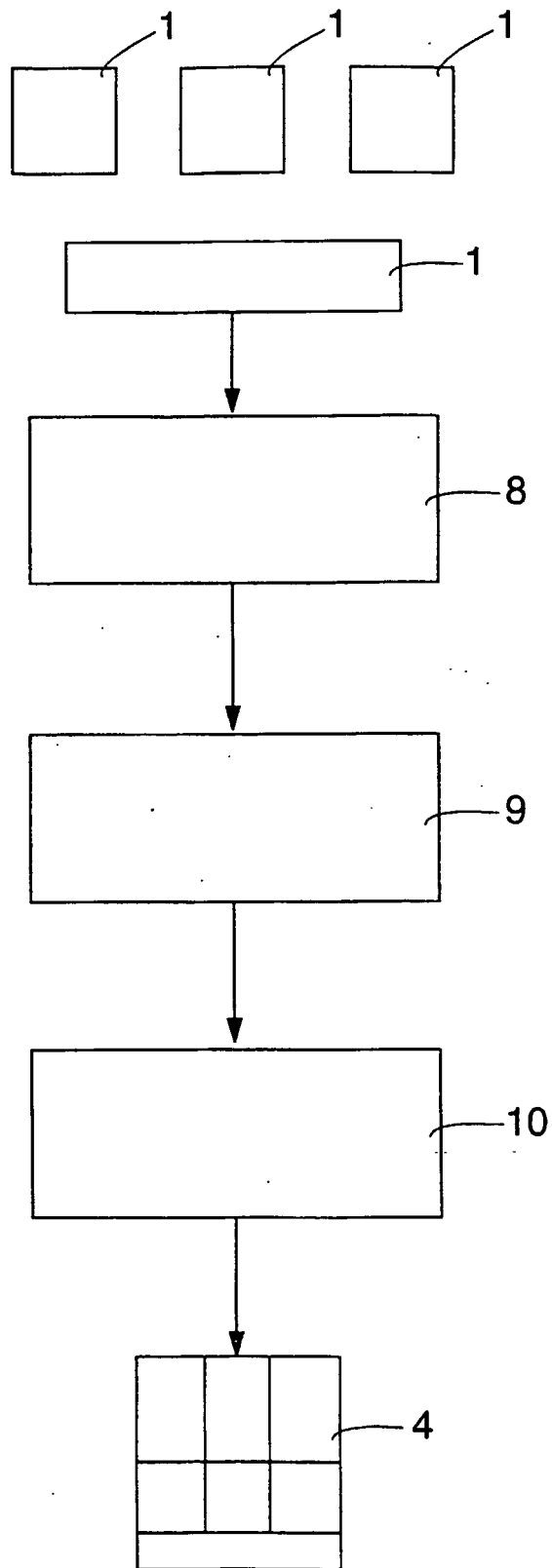


Fig. 3