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(54) **Selectively transferring packages between sets of conveyors**

(57) The invention relates to the packaging industry.

An assembly of distribution units 9 allow the selective joining of any one of conveyors 5 - 6 - 7 - 8 coming from the

packaging machines 1 - 2 - 3 - 4 to any one of conveyors 10 - 11 - 12 - 13 feeding collecting machines 14 - 15 - 16 - 17. Each distribution unit includes a plurality of movable elements, e.g. rollerway sections 24 - 27, with withdrawal movement of one of these elements resulting in an opening 28 connecting one of the conveyors 5 - 6 - 7 - 8 with one of the conveyors 10 - 11 - 12 - 13.

The invention has particular application to packaging and grouping of foodstuffs.

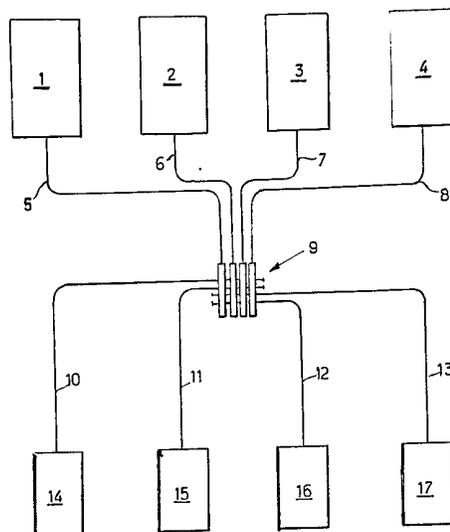


FIG. 1

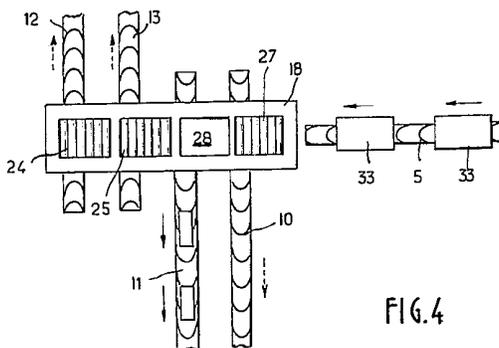


FIG. 4

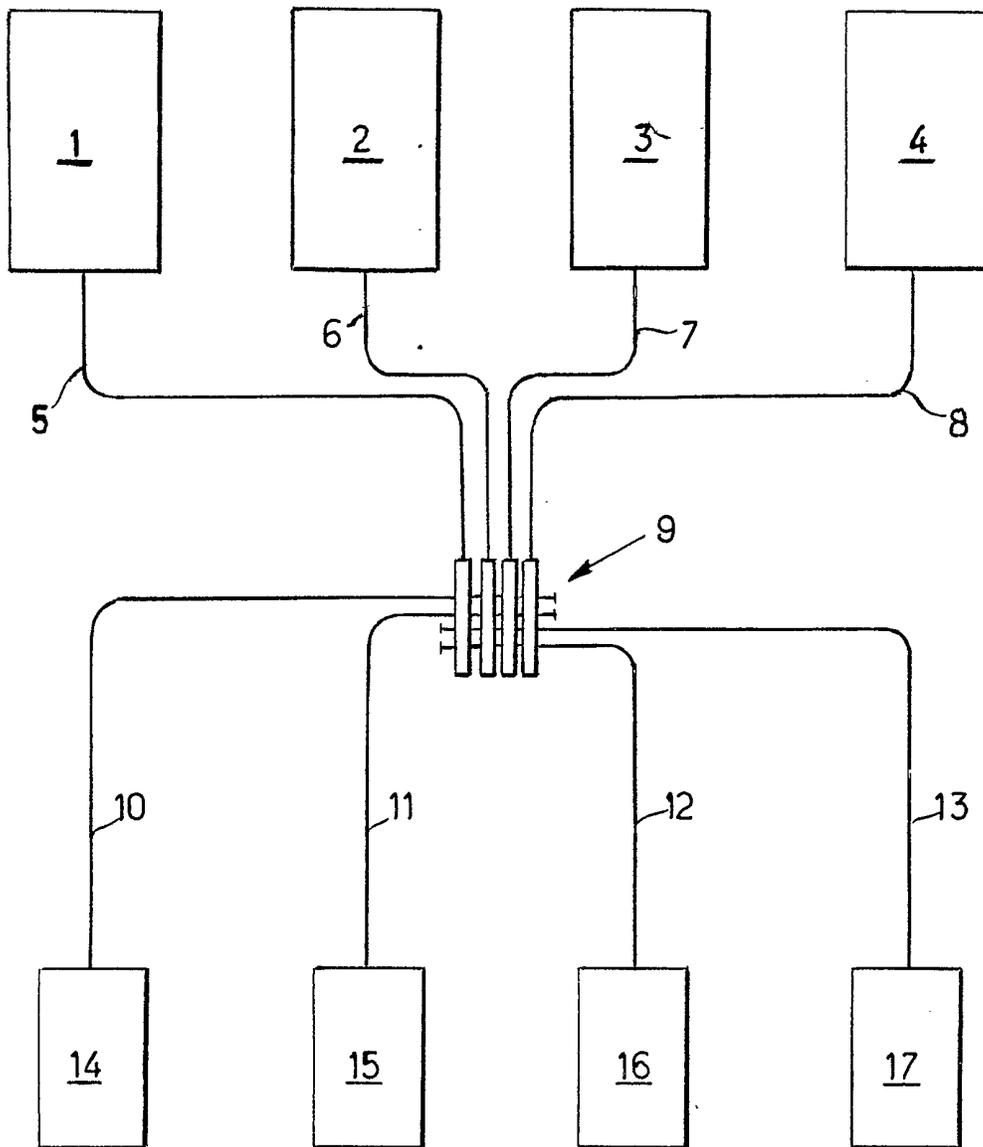


FIG.1

2/3

FIG. 2

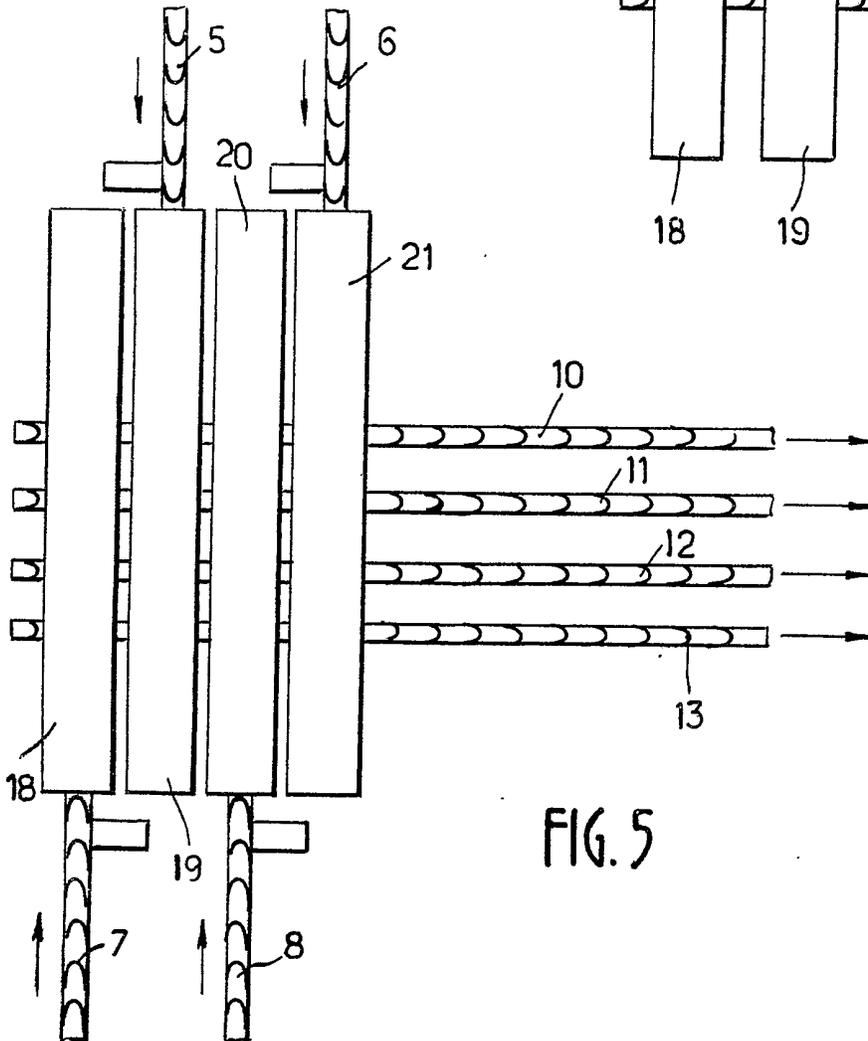
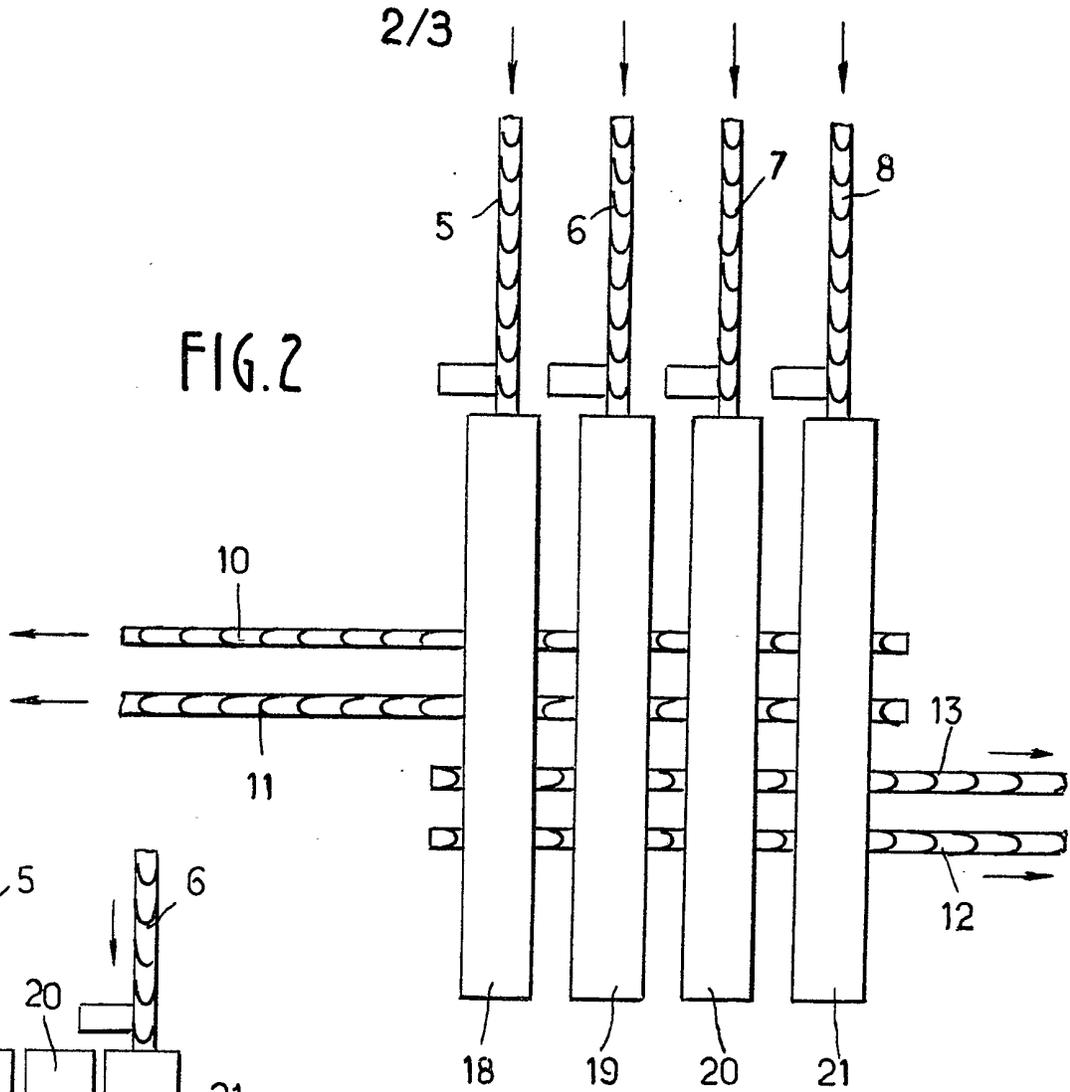


FIG. 5

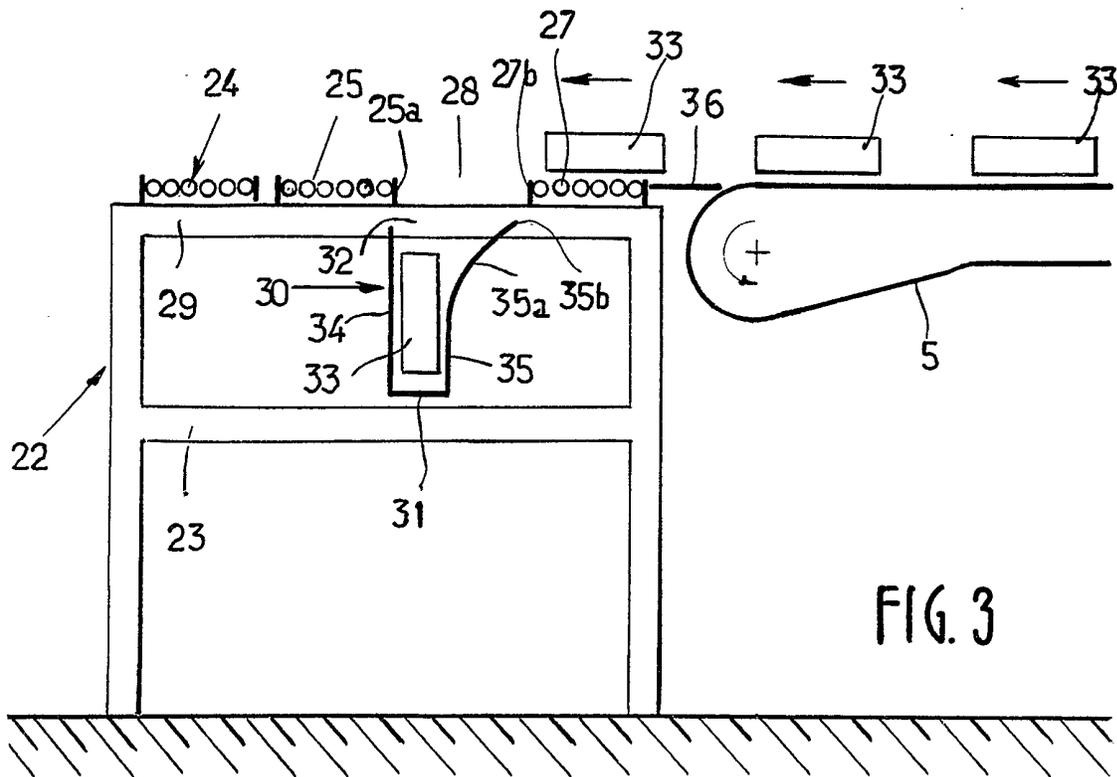


FIG. 3

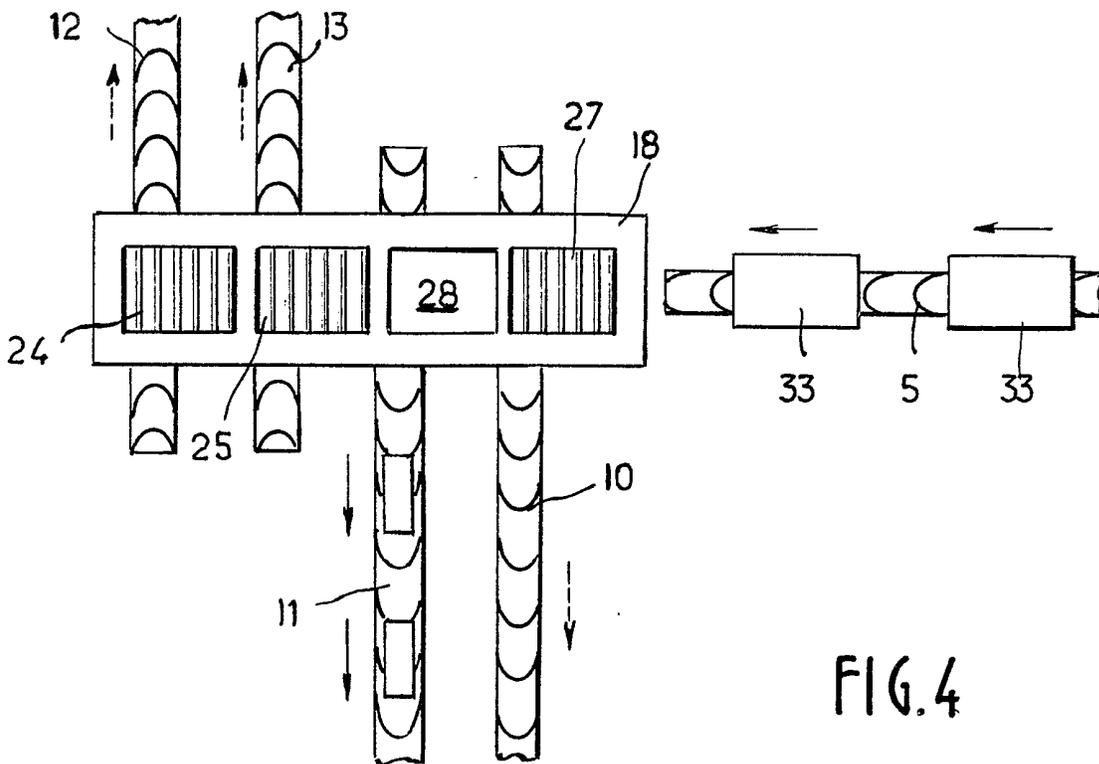


FIG. 4

SPECIFICATION

**System for distribution and transfer of goods
amongst several conveyors in a materials handling
5 installation**

This invention relates to a system for distribution and transferring goods amongst several conveyors
10 in a materials handling installation and, more particularly, in the foodstuffs industry where certain products are put into separate wrappings by production machines, before being collected and packaged in packaging machines.

15 At present, especially for large distribution centres such as supermarkets, foodstuffs such as milk, drinks, etc. are grouped then packaged before being delivered to the said distribution centres.

Consequently, in the manufacturing and packing
20 plants for these products, there are provided production machines where the bulk product is individually wrapped and collecting and packaging machines for the individually wrapped products. Between these two types of machines, it is necessary to provide
25 suitable means for transferring the products.

In order to direct the individually wrapped products towards the collecting and/or packaging machines, various devices can be used. One of these involves using a main conveyor to which conveyors
30 known as 'tributaries' are connected and suitable means to control transfer of goods on the tributaries to the main conveyor in such a way as to avoid two items arriving simultaneously, which would result in jamming. Another device involves the use of a
35 switching or diverging method. Generally speaking it consists of a movable element rotatable about a vertical axis enabling it to connect with two or three secondary circuits.

However, all these devices or their equivalent are
40 complex and very expensive since each conveyor used is a motorised conveyor driven independently of the other conveyors.

In fact, in the first type of device, breakdown of the main conveyor interrupts the feeding of the collect-
45 ing and packaging machines. In the second type of device, the same inconvenience arises if the pivoting element and/or the supply conveyor is out of service. However, the results on the production of packaged goods are far too serious when there is an interrup-
50 tion in the transfer system.

The object of the present invention is to mitigate the aforementioned inconveniences and to provide a transfer system which is simple in its construction,
55 reliable in its operation and which allows above all continued supply to the collecting and packaging machines even in the event of failure of one or more of the conveyors.

It therefore relates to a system for distribution and transfer of goods among several conveyors, the
60 system comprising motorised feed or input conveyors, motorised discharge or output means, means for transferring goods from the feed conveyors to the discharge means, and characterised in that the discharge means is located at least partly
65 below the transferring means which is constituted

by distribution units each associated with a respective feed conveyor, each distribution unit having several independent elements each adapted to be withdrawn to allow the transfer of goods from the
70 distribution units to the discharge means.

Other advantages and characteristics will become evident on reading the description given by way of non-limitative example of two embodiments of the invention, and from the attached drawings, in
75 which:-

Figure 1 is a block diagram of the system for distribution and transfer of goods according to one embodiment of the invention;

Figure 2 is a partial diagrammatic view of the system shown in *Figure 1* from below;

Figure 3 is a partial view in elevation of a distribution and transfer assembly with its guide means;

Figure 4 is a view from below of the means shown
85 in *Figure 3*;

Figure 5 is a partial view from below of another embodiment of a transfer system according to the invention.

In a wrapping and packaging installation of a bulk
90 product such as milk for example, production machines 1 to 4 supply, for example, bulk product to be packaged in the form of individually wrapped items. Each production machine 1 to 4 delivers the wrapped goods or individually wrapped item to the
95 motorised conveyors 5 to 8. The conveyors 5 to 8 connect with a distribution and transfer assembly indicated generally by the reference number 9 and from which motorised conveyors 10 to 13 leave each connecting and packaging machine 14 to 17 where
100 the individually wrapped goods are collected for example in groups of six (*Figure 1*).

The distribution and transfer assembly 9 is made up of distribution units 18 to 21, each connected to a
105 feed conveyor 5 to 8. The motorised discharge conveyors are for example grouped in pairs such as to discharge the individually wrapped products in two different directions. Thus, the conveyors 10 and 11 are arranged at least partly beneath the distribution units 18 to 21 and discharge the products
110 towards the left in *Figure 2*, while the conveyors 12 and 13, similarly located partly below the distribution units 18 to 21, discharge the products towards the right. Consequently, the individually wrapped products arriving, by means of the feed conveyors 5
115 to 8, at the distribution units 18 to 21, can be directed to any one of the discharge conveyors 10 to 13, in accordance with the supply requirements of the packaging machines 14 to 17. Moreover, the distribution units 18 to 21 are parallel to each other and
120 perpendicular to the discharge conveyors 10 to 13.

The distribution units 18 to 21 are arranged on a support structure 22 which comprises lower cross-bars 23 supporting the discharge conveyors and transfer means. Each distribution unit 18 to 21
125 comprises several modules 24 to 27, for example, four when the system includes four discharge conveyors, each constituted by a small free conveyor, said free conveyors being independent of each other and are capable of being withdrawn such as to
130 create in their place a gap or discharge opening 28.

In the space between the upper crossbars 29 of the structure 22 forming the supporting crossbars for modules 24 to 27, and the lower crossbars 23, there are arranged transfer means 30 each made up of a receiving channel, a guiding channel and a transfer channel. The transfer means may be a single unit fed by all the distribution units 18 to 21 or alternatively may include several channels each associated with a respective distribution unit. Preferably, each distribution unit 18 to 21 comprises as many elements as there are discharge conveyors such that each element is associated with a discharge conveyor. The transfer channel 30 has an open base 31 and an access opening 32 substantially equal to the discharge opening 28. Moreover, to ensure a better guidance, on transfer by gravity of the individually wrapped product 33, when the module 27 is situated upstream and adjacent said discharge opening 28, on the exit conveyor situated to the right of the open base 31 of the transfer channel 30, the transfer channel 30 consists of two side walls 34 and 35 of which one, 34, is substantially perpendicular and to the right of edge 25a of the module 25 situated downstream and adjacent the discharge opening 28 whilst the other wall 35 has at least a curved portion 35a of which the upper edge 35b is substantially to the right of the edge 27b of module 27 (Figure 3).

According to a modification shown in Figure 5, the distribution units are fed by two feed conveyors arranged at one of their ends and by two conveyors arranged at their other ends, the discharge conveyors being aligned in one direction. Therefore, the conveyors 5 to 8 are associated respectively with distribution units 19, 21, 18 and 20, the discharge conveyors 10 to 13 discharging the individually wrapped products towards the right on the drawing.

Operation of the distribution system of the present invention is as follows.

When the production machines 1 to 4 deliver the individually wrapped products to the motorised feed conveyors 5 to 8, said products arrive, in accordance with the feed conveyor which handles them, at a distribution unit 18 to 21. Having arrived at the end of the conveyor, for example the conveyor 5 on Figure 3, they are pushed by the following products on to an intermediate plate 36 until they are taken up by the first module 27. They continue their course until they fall into discharge opening 28 which is brought into operation by raising of a module, with the result that the individually wrapped products 33 are transferred on to the discharge conveyor 11 associated with the raised module. The individual products are thereafter conveyed by this conveyor to the appropriate packaging machine. By arranging a module of each distribution unit to be associated with each discharge conveyor, it is simple to ensure that the packaging machines are fed in the most efficient manner. In fact, if one considers the situation that the packaging machine 16 is unavailable for some reason, it is sufficient to effect discharge of the individual products by raising of the module 26, not shown, on each distribution unit 18 to 21 located upstream of the module which is associated with the discharge conveyor leading to the packaging

machine 16 which is defective or stopped. The individual products are thereafter discharged to the other packaging machines. It is to be noted that, by virtue of the design of the transfer channels 30, the individual products are guided during their fall under gravity such as to avoid any damage during their transfer to the discharge conveyors.

It is to be understood that the invention is not limited to the exemplary embodiments described and illustrated, numerous modifications may be made by the man skilled in the art in accordance with the desired application and without departing from the scope of the invention.

80 CLAIMS

1. A system for distribution and transfer of goods amongst several conveyors in a materials handling installation, comprising motorised feed or input conveyors, motorised discharge or output means, means for transferring goods from the feed conveyors to the discharge means, wherein the discharge means are located at least partly below the transfer means which are constituted by distribution units each associated with a feed conveyor, and wherein each distribution unit comprises several independent modules each adapted to be withdrawn to allow transfer of the goods of the distribution units to the discharge means.

2. A system as claimed in claim 1, wherein raising of each independent module defines a discharge opening for the goods on the distribution units to the discharge means.

3. A system as claimed in claim 2, wherein transfer of the goods is effected by gravity through the discharge opening to the discharge means which are arranged below the distribution units.

4. A system as claimed in any preceding claim, wherein each distribution unit includes as many movable modules as motorised conveyors which constitute the discharge means.

5. A system as claimed in any preceding claim, wherein each independent movable module is made up of a conveyor having free rollers.

6. A system as claimed in any preceding claim, wherein the transfer means comprises a movable channel having an open base for transfer and guidance of the goods and located directly below the discharge opening.

7. A system as claimed in any preceding claim, wherein the access opening of the movable channel is substantially equal to the discharge opening.

8. A system as claimed in any preceding claim, wherein the movable channel is constituted by two side walls connected to each other at their lower ends such as to define the open base, one of said walls being substantially vertical and located directly below an edge of the discharge opening whilst the other wall has at least a curved portion, the upper edge of which is substantially directly below the other edge of said discharge opening.

9. A system as claimed in any preceding claim, wherein the distribution units are arranged parallel to each other and perpendicular to the discharge conveyors.

10. A system as claimed in any preceding claim,
wherein the feed conveyors are each associated with
a production machine for wrapped products whilst
each discharge conveyor is associated with a
5 machine for packaging and grouping said wrapped
products.

11. A system for distribution and transfer of
goods amongst several conveyors in a materials
handling installation substantially as hereinbefore
10 described with reference to the accompanying draw-
ings.

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