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(71) Applicant: **Infia S.r.L.**
47032 Bertinoro Forlì Cesena (IT)

(72) Inventor: **MONTAGUTI, Giuseppe**
47521 Cesena (Forlì Cesena) (IT)

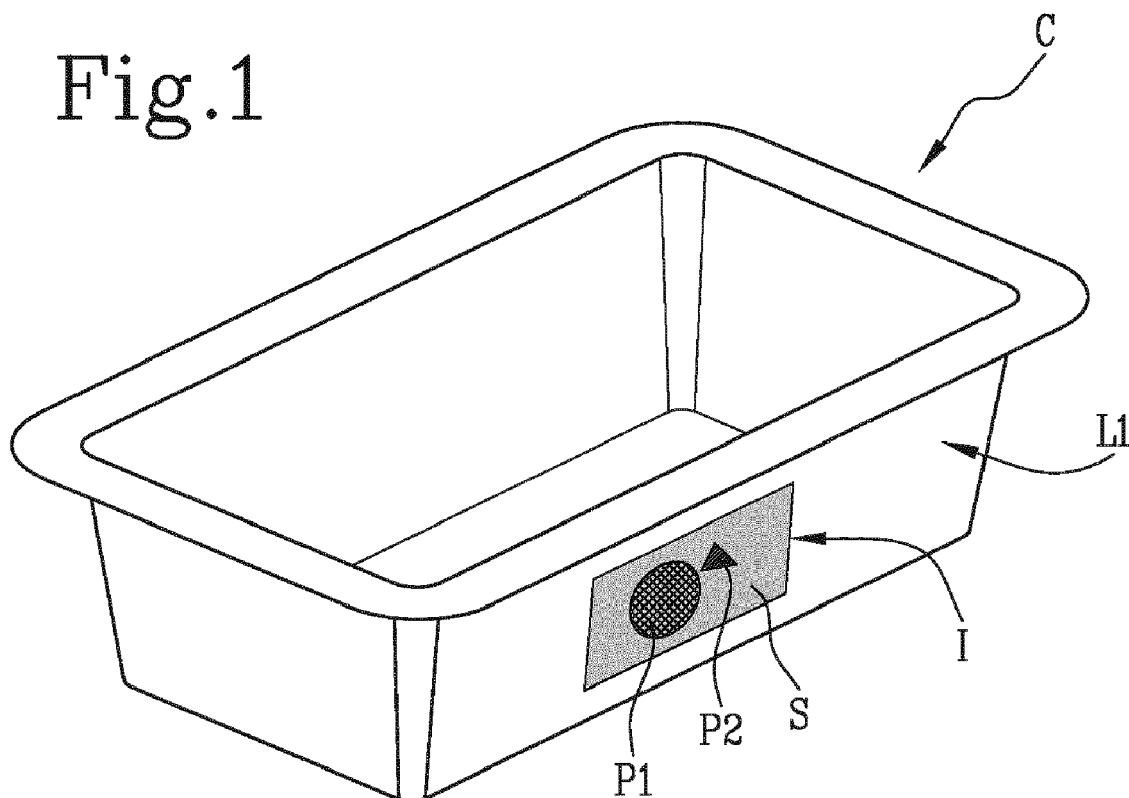
(74) Representative: **Falzoni, Davide Aldo**
Bugnion S.p.A.
Via di Corticella, 87
40128 Bologna (IT)

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(54) **METHOD AND APPARATUS FOR MAKING AN IMAGE ON A CONTAINER FOR FRUIT AND VEGETABLES**

(57) Described is a method for making an image on a container (C1, C2, C3, C4), preferably for containing fruit and vegetable products, and a machine (1) configured to automatically actuate the method.

Fig.1



Description

[0001] This invention relates to a method for making an image on a container, preferably for containing fruit and vegetables, and a machine configured for automatically actuating the method.

[0002] The containers for fruit and vegetable products are currently identified with images representing the product contained and/or the manufacturer. The images are printed on adhesive elements attached to the container.

[0003] The adhesive elements are pre-printed and are produced in groups including a large number of adhesive elements. In order to change the identification image of the container, it is necessary to throw away the adhesive elements already prepared, thus resulting in, for the manufacturer of the containers, a waste of costs necessary for the production and/or the purchase of the adhesive elements.

[0004] Patent document WO2006048022, belonging to the prior art for this patent application, describes an apparatus for printing images on the annular wall of plastic containers. Other documents belonging to the prior art of this patent application are patent document WO 2007029197A2, which describes a printed opaque sub-layer, and patent document DE102015202799A1, which describes a method for making a component of a domestic apparatus, in which the component is printed with an ink jet technology method.

[0005] For this reason, the need is felt by operators in the trade for a method for making an image on a container preferably for fruit and vegetable products, which allows this drawback to be overcome.

[0006] A further need felt by operators in the trade is that of rapidly printing or imprinting a high quality image of a plurality of containers one after the other.

[0007] A method is therefore provided for making an image on a container for containing food products, preferably fruit and vegetable products, comprising:

- a first step of printing or imprinting during which a background of an image is printed on a wall of the container, the background comprising a background colour;
- a first drying step during which the background is dried;
- a second step of printing or imprinting during which at least a portion of image is printed on the background, the portion of image being superposed on the background and comprising a colour of the portion different to the colour of background, in such a way that the image comprises the background and the portion of image superposed on the background;
- a second drying step during which the image is dried.

[0008] In this way, it is possible to rapidly print or imprint a high quality image of a plurality of containers one after the other and/or overcome the use of paper labels or the

like and the relative drawbacks.

[0009] The features of a method according to the invention and of a machine according to the invention will become clearer from the following detailed description of respective embodiments of the method according to this invention and of the machine according to this disclosure, given by way of non-limiting examples of the concepts claimed.

[0010] The detailed description which follows relates to the accompanying drawings, in which:

- Figure 1 is a perspective view of a container on which is made an image by means of a possible embodiment of a method according to the invention;
- Figure 2 is an enlargement of a part of the container, in an intermediate step of the method;
- Figure 3 is an enlargement of the part of Figure 2, at the end of the method;
- Figure 4 is a schematic view of the main components of a possible embodiment of a machine according to the invention.

[0011] In Figure 4 the numeral 1 denotes a possible embodiment of an automatic machine according to this description. The machine 1 is configured to make an image on each of a plurality of containers. Some of the containers of the plurality are indicated with C1, C2, C3 and C4 in Figure 4. The machine 1 is configured to automatically perform, for or on each of the containers of the plurality of containers, a possible embodiment of a method according to the invention.

[0012] Each of the containers are shown in Figure 4 may be the container labelled C in Figures 1 to 3. The container C is for containing food products. The container C is preferably for containing fruit and vegetables.

[0013] A method according to this invention is for making an image on a container. The container could be the container C of Figures 1 to 3, or one of the containers of Figure 4. The method could be performed by a machine which is different from a machine 1 according to the invention. An image which can be made by the method is shown in particular in Figure 1 and in detail in Figures 2 and 3.

[0014] The image I comprises a background S. The image comprises at least one portion P1 of image superposed on the background S. The background S comprises and/or is made by means of a background colour. The colour of the background may be any colour, preferably, however, the colour is white. The portion P1 comprises and/or is made of a colour of the portion different from that background colour. According to the method, when a plurality of portions P1 are applied, these are advantageously kept at least slightly detached from each other so as not to have interference of colour.

[0015] The method comprises a first printing or imprinting step. During this first printing or imprinting step, the above-mentioned background S is printed and/or made on a wall L1 of the container C. The background S is

preferably made and/or made on an outer side of the wall L1. The wall L1 is preferably a side wall which delimits a compartment for housing the food and/or fruit and vegetable products in the container C.

[0016] The wall L1 could be flat and/or not curved.

[0017] The machine 1 comprises a first printing or imprinting station 11. The first printing or imprinting station 11 is configured to perform the first printing or imprinting step on, and/or for each, of the containers of the above-mentioned plurality of containers. The first printing station 11 comprises a respective printing or imprinting roller 111.

[0018] In Figure 4, a first container C1 is in the first printing or imprinting station 11. Of the first container C1, the background S of the future image I is also indicated, whilst the background S is printed.

[0019] The printing or imprinting method comprises a first drying step. During the first drying step, the above-mentioned background S is at least partly and/or totally dried.

[0020] The machine comprises a first drying station 12. The first drying station 12 is configured to perform the first drying step on and/or for each of the containers of the above-mentioned plurality of containers. The first drying station 12 may comprise a lamp, for example a UV lamp.

[0021] In Figure 4 a second container C2 is in the second drying station 14. Of the second container C2, the background S of the future image I is also indicated, considering that the second container C2 has already been subjected to the first printing or imprinting step.

[0022] The printing or imprinting method comprises a second printing or imprinting step. During the second printing or imprinting step, the above-mentioned at least one portion P1 of the image is printed and/or made on the background S. In this way, the image I comprises the background S and the portion P1 of image P superposed on the background S.

[0023] The image I could comprise a plurality of portions of image superposed on the background S. Each of the portions of image is made by and/or comprises a respective colour different from the above-mentioned background colour and preferably different from each other, that is to say, equal to one or more different portions and different from the others.

[0024] In Figures 1 to 3 the image I comprises by way of example two portions P1 and P2 superposed on the background S.

[0025] The background S could be, by way of example, white. In Figures 1 to 3 the background S is grey only by way of example and/or for reasons of clarity in the identification of the background S.

[0026] By way of example, the portion labelled P1 could be green and the portion labelled P2 could be red. Each of the portions of image laid over the background S could be of any colour.

[0027] It should be noted that each of the containers of the plurality of containers of Figure 4 may be the con-

tainer C of Figures 1 to 3.

[0028] Figure 2 is an enlargement of the zone where the image I of the container C is situated, once the container C has been subjected at least to the first printing or imprinting step.

[0029] Figure 3 is an enlargement of the same area, once the container C has been subjected at least also to the second printing or imprinting step. Figure 1 is an overall view of the container C once it is been subjected to at least also to the second printing or imprinting step.

[0030] The machine 1 comprises a second printing or imprinting station 13. The second printing or imprinting station 13 is configured to perform the second printing or imprinting step on, and/or for each, of the containers of the above-mentioned plurality of containers. The second printing or imprinting station 13 comprises a respective printing or imprinting roller 131.

[0031] In Figure 4 a third container C3 is in the second printing or imprinting station 13. Of the third container C3, the background S is also indicated, considering that the third container C3 has already been subjected to the first printing or imprinting step. In Figure 4, the printing or imprinting roller 131 is imprinting on the background S the plurality of portions of images which will be superposed on this background S.

[0032] The method comprises a second drying step 14. During the second drying step, the image I is at least partly and/or totally dried.

[0033] The machine 1 comprises a second drying station. The second drying station 14 is configured to perform the second drying step. The second drying station 14 may comprise a lamp, for example a UV lamp.

[0034] In Figure 4 a fourth container labelled C4 is in the second drying station 14. Of the fourth container C4, the entire image I is also indicated, considering that the fourth container C4 has already been subjected to the second printing or imprinting step.

[0035] The method could comprise a lacquering step. During the lacquering step the image I is lacquered.

[0036] The machine 1 could comprise a lacquering station. The lacquering station is configured to perform the lacquering step.

[0037] The method could comprise a third drying step. During the third drying step, the lacquered image I is dried.

[0038] The machine 1 could comprise a third drying station. The third drying station is configured to perform the third drying step.

[0039] The steps of the method are performed whilst the container C is subjected to a transport movement.

[0040] Considering that the machine 1 is configured to perform the method on and/or for each of the containers of the above-mentioned plurality of containers, the machine comprises a transport system 15 which is configured to generate a respective transport movement for each of the containers. The transport movement of each container is designed to ensure that the container moves through the stations of the machine 1.

[0041] This transport movement is indicated by the arrow T of Figure 4.

[0042] The transport system 15 may comprise a transport element 153 and at least one motor to generate a movement of the transport element 153. The transport system 15 may comprise a plurality of pads. Each of the pads retains a respective container of the containers to make it integral with the movement of the transport element 153, in such a way as to cause the respective transport movement of the respective container. Figure 4 indicates a first pad 151 which retains the first container C1 and a second pad 152 which retains the second container C2.

[0043] At least one printing or imprinting step of the method is performed by means of a printing or imprinting movement tangential to the wall of the transport L1 and synchronous with the transport movement. This printing or imprinting movement could be, with reference, respectively, to the first printing or imprinting step and to the second printing or imprinting step, a rotation about itself of the roller 111 of the first printing or imprinting station 11 or of the roller 131 of the second printing or imprinting station 13.

[0044] For each printing step, the printing movement is a rotation about itself by the respective roller 111; 131.

[0045] Each of the printing steps occurs by progressive contact between a peripheral angular sector of the respective roller 111 or 131 and the wall L1.

[0046] Each printing station 11 or 13 is configured so that the respective printing occurs by progressive contact between a peripheral angular sector of the respective roller 111 or 131 and the wall L1.

[0047] The transport system 15 may comprise, as a transport element 153, a conveyor. The transport system 15 is in that case configured so that the conveyor 153 can be subjected to a translation to generate the transport movement.

[0048] The transport movement occurs by means of the conveyor 153 subjected to the translation to generate the transport movement.

[0049] Each printing station 11 or 13 is configured so that the rotation of the respective roller 111 or 131 is synchronised with the translation of the conveyor 153, in such a way that, for each instant of the printing step performed by the respective station 11 or 13, the speed of the angular sector of the respective roller 111 or 131, at the point of contact between roller 111 or 131 and the wall L1, is equal to the translation speed of the conveyor 153.

[0050] For each printing step, the rotation of the respective roller 111 or 131 is synchronised with the translation of the conveyor 153, in such a way that, for each instant of the printing step, the speed of the angular sector of the respective roller 111 or 131, at the point of contact between the respective roller 111 or 131 and the wall L1, is equal to the translation speed of the conveyor 153.

[0051] The conveyor may be, for example, a conveyor belt. A method or a machine according to the invention

rapidly achieves a high quality print of a plurality of containers one after the other. The method makes it possible to obtain an identification of each container by means of an image with a better aesthetic quality with respect to the images printed on the adhesive elements currently used. Moreover, the method or machine according to the invention allows one or more elements of the image to be printed to be varied on each container without the economic drawbacks which would result from having to throw away labels already purchased and/or already produced. A method according to the invention may also be considered as a method for labelling by printing, since the method is in particular designed in such a way that the printed image reproduces the image of a label.

Claims

1. A method for making an image (I) on a container (C) for containing food products, preferably fruit and vegetable products, comprising:

- a first step of printing or imprinting during which a background (S) of an image (I) is printed on a wall (L1) of the container (C), the background (S) comprising a background colour;
- a first drying step during which the background (S) is dried;
- a second step of printing or imprinting during which at least a portion (P1) of image is printed on the background (S), the portion (P1) of image being superposed on the background (S) and comprising a colour of the portion (P1) different to the colour of background (S), in such a way that the image (I) comprises the background (S) and the portion (P1) of image superposed on the background (S);
- a second drying step during which the image (I) is dried.

2. The method according to claim 1, wherein, during the second printing or imprinting step, a plurality of portions (P1, P2) of image are printed on the background (S), each (P1; P2) of the portions (P1, P2) of image being superposed on the background (S) and comprising a respective colour of the portion (P1; P2) different to the colour of background (S), in such a way that the image (I) comprises the background (S) and the plurality of portions (P1, P2) of image superposed on the background (S).

3. The method according to claim 1 or 2, comprising a lacquering step during which the image (I) is lacquered and a third drying step during which the lacquered image (I) is dried.

4. The method according to any one of the preceding claims, wherein the method is performed whilst the

container (C) is subjected to a transport movement.

5. The method according to claim 4, wherein each of the printing or imprinting steps (11, 13) is performed by means of a printing or imprinting movement, the printing movement being tangential to the wall (L1) and synchronous with the transport movement.

6. The method according to claim 5, wherein:

- for each printing step, the printing movement is a rotation about itself by a respective roller (111; 131);
- each of the printing steps occurs by progressive contact between a peripheral angular sector of the respective roller (111; 131) and the wall (L1);
- the transport movement occurs by means of a conveyor subjected to a translation to generate the transport movement;
- for each printing step, the rotation of the respective roller (111; 131) is synchronised with the translation of the conveyor in such a way that, for each instant of the printing step, the speed of the peripheral angular sector of the respective roller (111; 131) at the point of contact between the respective roller (111; 131) and the wall (L1) is equal to the translation speed of the conveyor.

7. The method according to claim 6, wherein the conveyor is a conveyor belt.

8. The method according to any one of the preceding claims, wherein the wall (L1) is flat.

9. An automatic machine for obtaining respective images on a plurality of containers (C1, C2, C3) for containing food products, preferably fruit and vegetable products, each (C) of which comprises at least one respective wall (L), the machine comprising a first printing or imprinting station (11), a first drying station (12), a second printing or imprinting station (13), and a second drying station (14);

wherein, for each (C) of the containers (C1, C2, C3):

- the first printing or imprinting station (11) is configured for printing a background (S) of an image (I) on the wall (L1) of the container (C), the background (S) comprising a background colour;
- the first drying station (12) is configured for drying the background (S) printed on the wall (L1) of the container (C);
- the second printing or imprinting station (13) is configured for printing on the background (S) at least one portion (P1) of image, the portion (P1) of image being superposed on the background (S) and comprising a colour different to the col-

our of the background (S), in such a way that the image (I) comprises the background (S) and the portion (P1) of image superposed on the background (S);

- the second drying station (14) is configured for drying the image (I).

10. The machine according to claim 9, wherein the second printing or imprinting station (13) is configured for printing on the background (S) a plurality of portions (P1, P2) of image, each (P1; P2) of the portions (P1, P2) of image being superposed on the background (S) and comprising a respective colour different to the colour of the background (S), in such a way that the image (I) comprises the background (S) and the plurality of portions (P1, P2) of image superposed on the background (S).

11. The machine according to claim 9 or 10, comprising a lacquering station (15) and a third drying station (16), wherein, for each (C) of the containers, the lacquering station is configured for lacquering the image (11) dried by the second drying station (14) and the third drying station (16) is configured for drying the image (I) once lacquered.

12. The machine (1) according to any one of claims 9 to 11, comprising a transport system (15) configured for to generating a transport movement of each (C) of the containers through the stations of the machine (1).

13. The machine according to claim 12, wherein each printing station is configured to perform the respective printing by means of a respective printing or imprinting movement, the printing movement being tangential to the wall (L1) and synchronous with the transport movement.

14. The machine according to claim 13, wherein:

- for each printing station (11; 13), the printing station (11; 13) comprises a respective roller (111; 131) and is configured so that the respective printing movement is a rotation about itself of the respective roller (111; 131);
- each printing station (11; 13) is configured so that the respective printing occurs by progressive contact between a peripheral angular sector of the respective roller (111; 131) and the wall (L1);
- the transport system comprises a conveyor and is configured so that the conveyor can be subjected to a translation to generate the transport movement;
- each printing station (11; 13) is configured so that the rotation of the respective roller (111; 131) is synchronised with the translation of the

conveyor in such a way that, for each instant of the printing performed by the respective station (11; 13), the speed of the angular sector at the point of contact between roller and the wall (L1) is equal to the translation speed of the conveyor. 5

15. The method according to claim 14, wherein the conveyor is a conveyor belt.

16. The machine according to any one of claims 9 to 15, wherein at least one of the drying stations of the machine (1) comprises a UV lamp. 10

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Fig.1

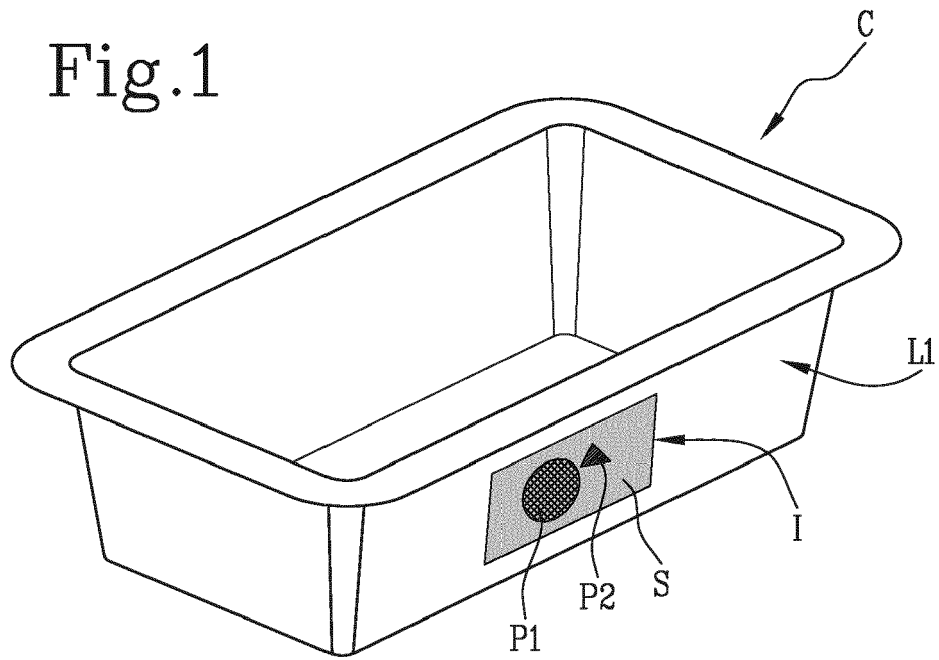


Fig.2

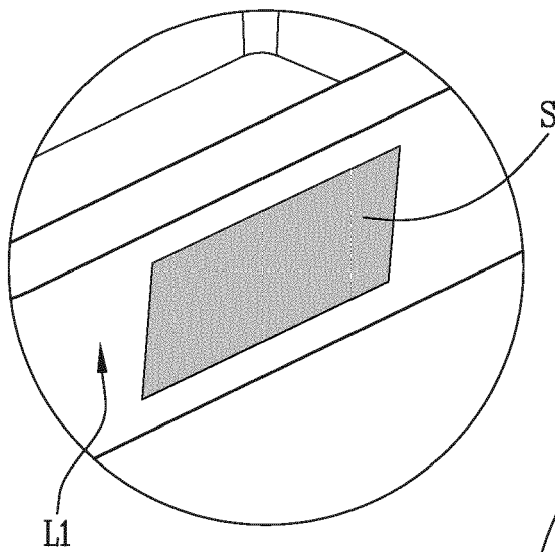
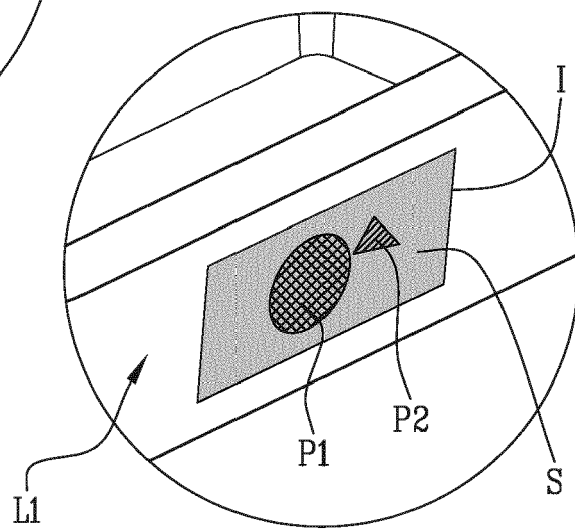


Fig.3



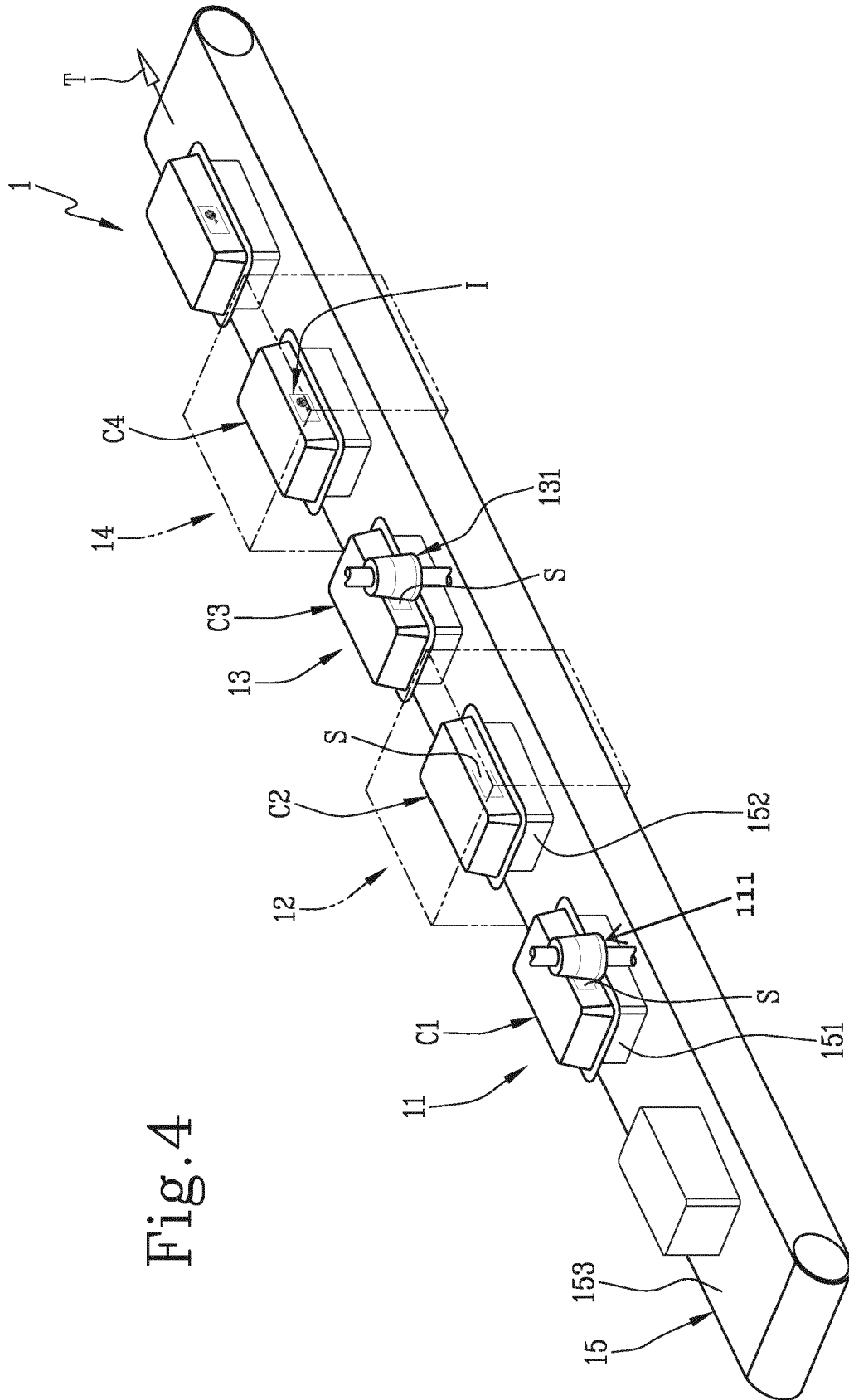


Fig. 4



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