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(71) Applicant: **LUSIA SOLUZIONI MECCANICHE S.R.L.** [IT/IT]; Via Migliara 46, I-04016 Sabaudia (Latina) (IT).

(72) Inventors: **BATTISTI, Antonio**; Via Caccini 37, I-04100 Latina (IT). **BATTISTI, Simone**; Via Caccini 37, I-04100 Latina (IT). **BATTISTI, Luca**; Via M. L. Pietrosanti 4/6, I-04100 Latina (IT).

(74) Agents: **DALL'OLIO, Daniele** et al.; INVENTION S.r.l., Via delle Armi 1, I-40137 Bologna (IT).

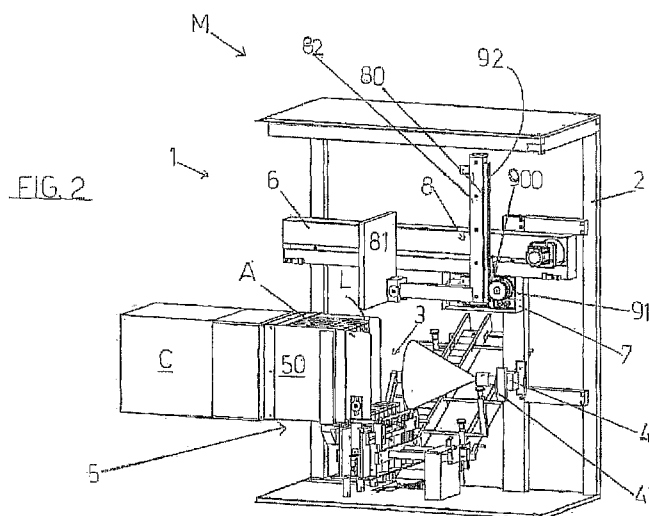
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(54) Title: AN IDENTIFYING AND ACCUMULATING DEVICE OF ARTICLES



(57) Abstract: An identifying and accumulating device (1, 10, 100) of articles (A), comprising: a detecting region (3); optical detecting means (4); an accumulating region (5) in which the articles (A) from the detecting region (3) are accumulated; the detecting region (3) is interposed between the accumulating region (5) and the optical detecting means (4); a linear guide (6, 60, 61); a carriage (7), mobile along the linear guide (6, 60, 61); a pusher (8), comprising a connecting arm (80) and a pushing plate (81) for pushing the articles (A) from the detecting region (3) to the accumulating region (5); the pushing plate (81) is drawn by the carriage (7) along a straight advancing pathway; the pusher (8) comprises movement means (900) which enable displacement of the pushing plate (81) out of the straight advancement pathway.



AN IDENTIFYING AND ACCUMULATING DEVICE OF ARTICLES.FIELD OF THE INVENTION

The present invention relates to the technical sector of packing articles; more in particular, the invention concerns an identifying and accumulating device of articles.

DESCRIPTION OF THE PRIOR ART

A device of known type for identifying and accumulating articles is usually present in a machine for packing articles, for example a boxing machine.

The known device (D) mentioned above, illustrated by way of example in figure 1, comprises:

- a detecting region (3) which receives a stack of articles (A) (for example cases) each provided with an identifying code; the articles (A) are arranged in such a way that the relative identifying code is at a side (L) of the stack;
- a television camera (4) arranged in proximity of the detecting region (3) and which detects the identifying code of each article (A) in the detecting region (3);
- illuminating means (41) associated to the television camera (4) so as to facilitate the detecting of the identifying code by the television camera (4);
- an accumulating region (5) in which the articles (A) must be accumulated in order to be successively packed.

In particular, the detecting region (3) is interposed between the accumulating region (5) and the television camera (4) is aligned to the accumulating region (5) and to the television camera (4).

The device (D) further comprises:

- a linear guide (6) fixed to the frame (2);

- a carriage (7) movable along the linear guide (6);
- a pusher (8) borne by the carriage (7), comprising an L-shaped connecting arm (80) fixed to the carriage (7) and a pushing plate (81) which is made of a transparent material and is fixed to the connecting arm (80).

5 The pushing plate (81), made of a transparent material, is drawn by the carriage (7) along a straight advancement pathway from a retracted position (the situation in figure 1), in which the pushing plate (81) is interposed between the detecting region (3) and the television camera (4), to an advanced position in which the pushing plate (81) is located in the
10 accumulating region (5).

In detail, once a stack of articles (A) is in the detecting region (3), the television camera (4) (with the aid of the illuminating means (41)) detects the identifying code of each article (A) which forms the stack. This is enabled by the fact that the pushing plate (81) is made of a transparent material (for
15 example Plexiglass).

Thus, the pushing plate (81) is moved along the straight advancement pathway, so as to push the stack of articles (A) from the detecting region (3) into the accumulating region (5).

20 These operations are repeated until a certain predetermined number of stacks of articles (A) is arranged in the accumulating region (5); in the accumulating region (5) two guide and containing walls (50) can be present, between which the stack of articles (A) is accumulated prior to packaging. The articles (A) can be transferred from the accumulating region (5) into, for example, a box (C), arranged for example with the relative opening facing towards the
25 accumulating region (5).

The above-described device exhibits however some drawbacks.

In fact, though the pushing plate is made of a transparent material, correct detecting of the identifying codes of the articles by the television cameras is not guaranteed.

Primarily, this is due to the fact that the pushing plate made of transparent material (for example Plexiglass) can be subject over time to damage (such as scratching, splintering, etc.).

5 Secondly, the fact of using a transparent material can cause undesired light reflections, aggravated by the presence of the illuminating means.

The presence of damage to the pushing plate and/or light reflections can even significantly obstruct the detection of the identifying codes of the articles by the television camera.

SUMMARY OF THE INVENTION

10 The aim of the present invention is to obviate the above-mentioned drawbacks.

This aim is attained by an identifying and accumulating device of articles according to claim 1, claim 5 and claim 10.

15 The device of the invention advantageously enables, in any situation, a correct detection of the identifying codes of the articles, differently to the prior art.

With the invention, even in the presence of damage to the pushing plates (such as splintering or scratches) and/or of light reflections, excellent detection of the identifying codes of the articles is still guaranteed.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Specific embodiments and further advantageous characteristics of the invention will become evident in the following description, with the aid of the appended figure, in which:

- figure 1 is a perspective view of an identifying and accumulating device of articles of the prior art;
- 25 - figure 2 is a perspective view of an identifying and accumulating device of articles according to the invention, in a first embodiment, in which some parts

have been removed better to evidence others;

- figure 3 illustrates a perspective view of an identifying and accumulating device of articles according to the invention in an alternative embodiment of figure 2;

5 - figure 4 is a perspective view of an identifying and accumulating device of articles according to the invention in a further variant with respect to figure 3, wherein some parts have been removed better to evidence others;

10 - figure 5 is a perspective view of an identifying and accumulating device of articles according to the invention in a further variant with respect to the preceding ones, in which some parts have been removed better to evidence others;

- figures 6 and 7 illustrate two perspective views of an identifying and accumulating device according to the present invention, in two different operating situations of a second embodiment;

15 - figures 6A, 7A, respectively illustrate details H and K of figure 6 and figure 7, according to further larger-scale views;

- figure 8 is a perspective view of an identifying and accumulating device of the present invention, in a third embodiment;

- figure 8A illustrates detail J of figure 8, according to a larger-scale view.

20 DESCRIPTION OF PREFERRED EMBODIMENTS

Note that in the following description the same reference numerals will be used for elements alike to figure 1, in which a device of known type is illustrated.

25 In the following three embodiments of the invention will be described (and any eventual variants), which are connected to one another by a single inventive concept, and possess corresponding technical characteristics. The three embodiments obviate, in an alternative way, the same technical problem, as

will be made clear in the following.

With reference to figures 2-8A, numerals 1, 10 and 100 denote an identifying and accumulating device of articles (A) according to different embodiments of the present invention. In particular, the articles (A) are provided with an identifying code (for example a standardized GS1 code, such as Barcode, Datamatrix, etc.).

In a first embodiment, illustrated in figures 2-5, the device (1) comprises: a frame (2); a detecting region (3), in which the articles (A) are positioned in a row in such a way that the relative identifying code is arranged at a side (L) of the row; optical detecting means (4) arranged in proximity of the detecting region (3) for detecting the identifying code of the articles (A) when the articles (A) are arranged in the detecting region (3).

The device (1) further comprises: an accumulating region (5) in which the articles (A) coming from the detecting region (3) are accumulated so as to be subsequently packed; in particular, the detecting region (3) is interposed between the accumulating region (5) and the optical detecting means (4) and is aligned to the accumulating region (5) and the optical detecting means (4). In other terms, the detecting region (3), the accumulating region (5) and the optical detecting means (4) are arranged along a line.

Further, the device (1) comprises a linear guide (6, 60, 61) fixed to the frame (2), a carriage (7) that is mobile along the linear guide (6, 60, 61); and a pusher (8) borne by the carriage (7), comprising a connecting arm (80) constrained to the carriage (7) and a pushing plate (81) which is borne by the connecting arm (80). In detail, the pushing plate (81) is dimensioned so as to push the articles (A) from the detecting region (3) to the accumulating region (5).

The pushing plate (81) is drawn by the carriage (7) along a straight advancing pathway from a retracted position, in which the pushing plate (81) is interposed between the detecting region (3) and the optical detecting means (4) and wherein the pushing plate (81) is aligned with the detecting region (3)

and the optical detecting means (4), to an advanced position in which the pushing plate (81) is at the accumulating region (5).

In particular, the pusher (8) further comprises movement means (900) for moving the connecting arm (80) and the pushing plate (81) with respect to the carriage (7), which movement means (900) enable displacing the pushing plate (81) out of the straight advancement pathway in order that the optical detecting means (4) face the articles (A) arranged in a row in the detecting region (3) so as to detect the relative identifying code (this situation is illustrated in figure 2-5).

With the device (1), correct detecting of the identifying code of the articles (A) is advantageously guaranteed. In fact, because of the presence of the movement means (900), the pushing plate (81) is brought out of the straight pathway, thus enabling the optical means (which for example comprise a television camera (4) or a photographic camera) to optimally and completely detect the identifying codes of the articles (A) in the detecting region (3).

In the prior art the pushing plate was made of a transparent material and was constrained to carry out only the straight advancement path described above: in fact, the connecting arm was unremovably fixed to the carriage. During the identifying operation of the articles, therefore, the pushing plate was aligned to the articles and to the optical detecting means and interposed between the articles and the optical detecting means.

In the prior art, therefore, the presence of any damage to the pushing plate which might take place over time (such as scratches, small splinters) and/or light reflection, were causes of an incorrect detecting of the identifying codes of the articles, or in any case a non-optimal detecting.

Further, account must be taken of the fact that in the prior art even the presence of the connecting arm obstructed the detection of the identifying codes by the television camera. In fact, the connecting arm was not made of a transparent material and thus at least partly encroached upon the field of vision of the television camera. In this way the detecting of the identifying

codes was only partial.

5 Differently, with the device (1) the fact that the connecting arm (80) is mobile with respect to the carriage (7) enables taking the connecting arm (80) out of the field of vision of the optical detecting means (4), and thus enabling a complete detecting of the identifying codes of the articles (A) by the optical detecting means (4).

10 As the pushing plate (81) of the device (1) is taken out of the straight advancement pathway during the detecting of the identifying codes by the optical detecting means (4), there is no requirement for it to be made of a transparent material, i.e. it can be made of an opaque material.

In particular, the articles (A) can be positioned in the detecting region (3) in a stack (i.e. in a plurality of rows) as in the case illustrated in the accompanying figures.

15 In detail, once the articles (A) arranged in a row are positioned in the detecting region (3), the pushing plate (81) is brought out of the straight advancing pathway and the optical detecting means (4) can detect the identifying code of the articles (A), directly facing the side (L) of the row of articles (A). In other words, with the device (1) there is no operating element or group which is interposed between the optical detecting means (5) and the side (L) of the row of articles (A) so as to obstruct the detecting of the identifying codes.

20 Therefore the pushing plate (81) is moved along the straight advancement pathway, so as to push the articles (A) from the detecting region (3) into the accumulating region (5).

25 The accumulating region (5) can comprise, for example, two guide and containing walls (50), facing one another, as in the illustrated case, between which the articles (A) are arranged, pushed by the pusher (8), before being packed. For example, still with reference to figures 2-5, a carton (C) can be present, with the opening thereof facing and turned towards the accumulating region (5). When a certain number of articles (A) is arranged in the

accumulating region (5), the articles (A) can be pushed into the carton (C) by the pusher (8) (this situation is not illustrated).

5 In a preferred embodiment, illustrated in figure 2, the connecting arm (80) comprises a portion (82) that is transversal to the straight advancement pathway; further, in this variant, the movement means (900) comprise: a motor mounted on-board the carriage (7); a pinion (91) activated in rotation by the motor; and a rack (92) which is fixed to the portion (82) of the connecting arm (80) and which engages with the pinion (91) so that the connecting arm (80) and the pushing plate (81) are further mobile in a direction that is transversal to the straight advancement pathway.

The variant is advantageously particularly compact. In fact the movement of the connecting arm (80) and pushing plate (81) in a transversal direction with respect to the straight advancement pathway in no way interferes with the identifying and accumulating operations of the articles (A).

15 In particular, the portion (82) of the connecting arm (80) can be perpendicular to the straight advancement pathway (as in the case of figure 2). In this case, the overall size of the device (1) is further reduced. In fact, the displacement of the connecting arm (80) and the pushing plate (81) is vertical, vastly reducing the space required for moving the connecting arm (80) and the pushing plate (81).

20 In a further variant, illustrated in figures 3 and 4, the movement means (900) comprise a motor (901) (visible in figure 4) mounted on-board the carriage (7), the output shaft (93) (also visible in figure 4) of which commands rotation of the connecting arm (80) and the pushing plate (81). In other terms, the connecting arm (80) is hinged to the carriage (7).

25 In detail, the motor (901) is fixed to the carriage (7) and the output shaft (93) of the motor (901) can be arranged such as to be parallel to the straight pathway (this is the case of figure 3). Alternatively, the output shaft (93) of the motor (901) can be arranged such as to be transversal (for example perpendicular) to the straight pathway (the case of figure 4).

In a further variant, illustrated in figure 5, the device (1) comprises two linear guides (60, 61), first (60) and second (61), parallel to one another to which the carriage (7) is constrained and along which the carriage (7) can slide. In this embodiment the carriage (7) comprises a transversal portion (70) (for example perpendicular) to the linear guides (60, 61) along which the connecting arm (80) can slide. During the straight advancement pathway, the connecting arm (80) is constrained by the carriage (7) and is arranged in a first position at the first linear guide (60). The movement means in this case enable translation of the connecting arm (80) (and consequently of the pushing plate (81) along the transversal portion (70) of the carriage (7) into a second position at the second linear guide (61) (the situation illustrated in figure 5), enabling the optical detecting means (4) to detect the identifying codes of the articles (A).

With reference to accompanying figures 2-5, the connecting arm (80) has an L-shaped configuration, i.e. it exhibits a first portion (82) that is perpendicular to the straight advancement pathway and a second portion that is perpendicular to the first portion (i.e. parallel to the straight advancement pathway) and connected to the first portion (see for example figure 2).

In a second embodiment of the invention, illustrated in figures 6, 6A, 7 and 7A, the device comprises: a detecting region (3) in which the articles (A) are positioned in a row such that the relative identifying code is arranged at a side (L) of the row; optical detecting means (4) (which for example comprise a television camera or a photographic camera) for detecting the identifying code of the articles (A) when the articles (A) are arranged in the detecting region (3).

The device (100) further comprises: an accumulating region (5) in which the articles (A) coming from the detecting region (3) are to be accumulated in order to be successively packed; the detecting region (3) is interposed between the accumulating region (5) and the optical detecting means (4) and is aligned to the accumulating region (5) and to the optical detecting means (4).

5 The device (100) further comprises a pusher (8) for pushing the articles (A) from the detecting region (3) to the accumulating region (5), comprising a pushing plate (81) which is mobile along a straight pathway from a retracted position (see figures 7 and 7A), in which the pushing plate (81) is aligned with the optical detecting means (4) and faces a side (L) of the row of articles (A) arranged in the detecting region (3), to an advanced position in which the pushing plate (81) is at the accumulating region (5), and vice versa.

10 In particular, the pushing plate (81) comprises a through-opening (9), and the pusher (8) comprises a closing element (90) dimensioned such as to close the through-opening (9) of the pushing plate (81).

15 The closing element (90) is constrained to the pushing plate (81) so as to be mobile between two configurations: a first configuration in which it is arranged in the through-opening (9), closes the through-opening (9) and defines, with the pushing plate (81), a pushing surface (S) for pushing the articles (A) from the detecting region (3) to the accumulating region (5) when the pushing plate (81) is moved into the advanced position (see figures 6, 6A); and a second configuration in which it makes the through-opening (9) accessible (see figures 7, 7A).

20 In detail, the through-opening (9) is arranged and dimensioned such that, when the pushing plate is in the retracted position and the closing element (90) is moved into the second configuration, the optical detecting means (4) are facing towards the through-opening (9) and, through the through-opening (9), face the articles (A) arranged in the detecting region (3), in such a way as to detect the relative identifying code thereof (see figures 7, 7A).

25 In this case too the optical detecting means (4) are advantageously in no way obstructed in detecting the identifying code of the articles (A), as the presence of the through-opening (9) of the pushing plate (81) enables completely freeing the visual field of the optical detecting means (4).

30 In a preferred variant, illustrated in figures 6, 6A, 7 and 7A, when the pushing plate (81) is in the retracted position and the closing element (90) is in the

second configuration, the optical detecting means (4) are at the through-opening (9) (i.e. into the through-opening (9), see the detail of figures 7, 7A). In other terms, in this variant, the retracted position of the pusher plate (81) is at the optical detecting means (4).

5 Alternatively the retracted position of the pushing plate (81) can be interposed between the optical detecting means (4) and the detecting region (3): clearly the through-opening (9) will be adequately dimensioned so as to enable the optical detecting means (4) to detect the identifying code of the articles (A) through the through-opening (9). In any case, the through-opening (9) is
10 clearly aligned with the optical detecting means (4).

Once more with reference to the variant of figures 7, 7A, the device (100) further comprises a frame (2) and movement means (94, 95) of the closing element (90). In detail, the movement means (94, 95) comprise a fixed part (94) solidly constrained to the frame (2), and a mobile part (95) borne by the
15 pushing plate (81), connected to the closing element (90) and movable with respect to the pushing plate (81) so as to bring the closing element (90) into the relative second configuration. The fixed part (94) and the mobile part (95) are reciprocally arranged and conformed such that when the pushing plate (81) is moved into the relative retracted position, the fixed part (94) contacts
20 and moves the mobile part (95), determining the movement of the closing element (90) into the relative second configuration (and thus making the through-opening (9) accessible).

In this way, while the pushing plate (81) is brought into the relative retracted position, there is, in perfect phase relation, an advantageous movement of the
25 closing element (90) into the relative second configuration, thanks to the fact that the fixed part (94) pushes the mobile part (95) and moves it.

The closed element (90) when it is in the second configuration for example extends towards the side (L) of the row of articles (A).

Clearly, when the pushing plate (81) is moved by the relative retracted position
30 to the relative advanced position, the closing element (90) is newly moved into

the relative first configuration.

The optical detecting means (4) can be solidly constrained to the frame (2); for example, the fixed part (94) can be fixed to the optical detecting means (4) (as in the case illustrated in figures 7, 7A).

5 In the above-described variant, the fixed part (94) of the movement means (94, 95) comprises an abutting element (94), and the mobile part (95) of the movement means (94, 95) comprises a cam mechanism (95) connected to the closing element (90), rotatable with respect to an axis passing through the pushing plate (81).

10 The abutting element (94) has for example a prevalently longitudinal shape and can exhibit an inclined edge, i.e. a shape which tapers towards an end of the abutting element itself (see figures 6A, 7A). This variant is particularly simple from the constructional point of view, effective in functioning and bears modest costs.

15 Clearly the fixed part (94) and the mobile part (95) will be adequately dimensioned according to the dimension of the through-opening (9) and the retracted position of the pushing plate (81). Obviously, other variants are possible for the movement of the closing element (90).

20 In the variant of figures 6, 6A, the closing element (90) is hinged to an edge of the through-opening (9).

The through-opening (9) can have, for example, a shape such that the relative edges define a parallelogram; the closing element (90) in this case can be hinged to any one of the four edges which each constitute a side of the parallelogram.

25 In other words, the closing element (90) is movable such that when it is in the second configuration thereof it develops, with respect to the through-opening (9), to the right or the left, or up or down.

The pushing plate (81) can be fixed to a connecting arm (80) (for example L-

shaped) which is also a part of the pusher (8), as in the illustrated case.

In the above-cited variant, the device (100) further comprises a linear guide (6) fixed to the frame (2); and a carriage (not visible) mobile along the linear guide (6) to which the connecting arm (80) is fixed.

5 In a third embodiment, illustrated in figures 8 and 8A, the device (10) comprises: a detecting region (3) in which the articles (A) are positioned in a row such that the relative identifying code is arranged at a side (L) of the row; optical detecting means (4) (which for example comprise a television camera or a photographic camera) for detecting the identifying code of the articles (A)
10 when the articles (A) are arranged in the detecting region (3).

The device (10) further comprises: an accumulating region (5) in which the articles (A) coming from the detecting region (3) are to be accumulated in order to be successively packed; in particular, the detecting region (3) is interposed between the accumulating region (5) and the optical detecting
15 means (4) and being aligned to the accumulating region (5) and to the optical detecting means (4).

The device (10) further comprises a pusher (8) for pushing the articles (A) from the detecting region (3) to the accumulating region (5), comprising: a connecting arm (80); a pushing plate (81) constrained to the connecting arm
20 (80), which pushing plate (81) is mobile along from a retracted position, in which the pushing plate (81) is aligned with the optical detecting means (4) and faces a side (L) of the row of articles (A) arranged in the detecting region (3), to an advanced position in which the pushing plate (81) is at the accumulating region (5); and vice versa.

25 In particular, the pushing plate (81) is further mobile with respect to the connecting arm (80) such as to move externally of the straight pathway and thus enable the optical detecting means (4) to face the articles (A) arranged in the detecting region (3), such as to detect the identifying code thereof.

In other terms, the pushing plate (81) is constrained to the connecting arm

(80) so as to be mobile (for example rotatable) between two extreme configurations, an operative configuration in which it is aligned to the optical detecting means (4) and can push the articles (A) from the detecting region (3) to the accumulating region (5), and a non-operative configuration (illustrated in figures 8, 8A), in which it is not aligned to the optical detecting means (4) and enables the means (4) to detect the identifying code of the articles (A).

For this reason, the third embodiment has the same advantages as the first and second above-described embodiments.

The device (10) can further comprise motorisation means, for enabling movement of the pushing plate (81) out of the straight pathway, for example in order to enable rotation with respect to the connecting arm (80).

The motorisation means (not illustrated) can move the pushing plate (81) when the plate (81) is brought into the relative retracted position, in any case so as not to interfere with the optical detecting means (4).

In particular, the pushing plate (81) can be moved in various orientations so as to be, with respect to the connecting arm (80), to the right or the left or above or below (as in the illustrated case).

In this case too the illustrated device (10) can comprise a frame (2), a linear guide (6) fixed to the frame (2); and a carriage (not visible) mobile along the linear guide (6) which the connecting arm (80) is fixed (which is for example L-shaped).

The device (1, 10, 100) of one of the illustrated embodiments can comprise illuminating means, associated to the optical detecting means (4) and predisposed to illuminate the detecting region (3), for facilitating detection of the identifying codes by the optical detecting means (4).

The invention further relates to a machine (M) for packing articles (A) provided with an identifying code, comprising an identifying and accumulating device (1, 10, 100) for identifying and accumulating the articles (A) according to any one of the described embodiments.

CLAIMS

1).An identifying and accumulating device (1) of articles (A) provided with an identifying code, comprising:

a frame (2);

5 a detecting region (3), where the articles (A) are positioned in a row in such a way that the relative identifying code is arranged at a side (L) of the row;

optical detecting means (4) arranged in proximity of the detecting region (3) for detecting the identifying code of the articles (A) when the articles (A) are arranged in the detecting region (3);

10 an accumulating region (5) in which the articles (A) coming from the detecting region (3) are accumulated so as to be subsequently packed; the detecting region (3) being interposed between the accumulating region (5) and the optical detecting means (4) and being aligned to the accumulating region (5) and the optical detecting means (4);

15 a linear guide (6, 60, 61) fixed to the frame (2);

a carriage (7) that is mobile along the linear guide (6, 60, 61);

a pusher (8) borne by the carriage (7), comprising a connecting arm (80) constrained to the carriage (7) and a pushing plate (81) which is borne by the connecting arm (80), which pushing plate (81) is dimensioned so as to push
20 the articles (A) from the detecting region (3) to the accumulating region (5);

the pushing plate (81) being drawn by the carriage (7) along a straight advancing pathway from a retracted position, in which the pushing plate (81) is interposed between the detecting region (3) and the optical detecting means (4) and wherein the pushing plate (81) is aligned with the detecting region (3)
25 and the optical detecting means (4), to an advanced position in which the pushing plate (81) is at the accumulating region (5);

the device (1) being characterised in that the pusher (8) further comprises

5 movement means (900) for moving the connecting arm (80) and the pushing plate (81) with respect to the carriage (7), which movement means (900) enable displacing the pushing plate (81) out of the straight advancement pathway in order that the optical detecting means (4) face the articles (A) arranged in a row in the detecting region (3) so as to detect the relative identifying code.

10 2). The device (1) of claim 1, wherein the connecting arm (80) comprises a portion (82) that is transversal to the straight advancement pathway; and wherein the movement means (900) comprise: a motor mounted on-board the carriage (7); a pinion (91) activated in rotation by the motor; and a rack (92) which is fixed to the portion (82) of the connecting arm (80) and which engages with the pinion (91) so that the connecting arm (80) and the pushing plate (81) are further mobile in a direction that is transversal to the straight advancement pathway.

15 3). The device (1) of the preceding claim, wherein the portion of the connecting arm (80) is perpendicular to the straight advancement pathway.

4). The device (1) of claim 1, wherein the movement means (900) comprise a motor (901) mounted on-board the carriage (7), the output shaft (93) of which commands rotation of the connecting arm (80) and the pushing plate (81).

20 5). An identifying and accumulating device (100) of articles (A) provided with an identifying code, comprising:

- a detecting region (3) in which the articles (A) are positioned in a row such that the relative identifying code is arranged at a side (L) of the row;
- optical detecting means (4) for detecting the identifying code of the articles (A) when the articles (A) are arranged in the detecting region (3);
- an accumulating region (5) in which the articles (A) coming from the detecting region (3) are to be accumulated in order to be successively packed; the detecting region (3) being interposed between the accumulating region (5) and the optical detecting means (4) and being aligned to the accumulating

region (5) and to the optical detecting means (4);

- 5 - a pusher (8) for pushing the articles (A) from the detecting region (3) to the accumulating region (5), comprising a pushing plate (81) which is mobile along a straight pathway from a retracted position, in which the pushing plate (81) is aligned with the optical detecting means (4) and faces a side (L) of the row of articles (A) arranged in the detecting region (3), to an advanced position in which the pushing plate (81) is at the accumulating region (5); and vice versa;

the device (100) is characterised in that:

- 10 the pushing plate (81) comprises a through-opening (9);

15 the pusher (8) further comprises a closing element (90) dimensioned such as to close the through-opening (9) of the pushing plate (81) and constrained to the pushing plate (81) so as to be mobile between two configurations: a first configuration in which it is arranged in the through-opening (9), closes the through-opening (9) and defines, with the pushing plate (81), a pushing surface (S) for pushing the articles (A) from the detecting region (3) to the accumulating region (5) when the pushing plate (81) is moved into the advanced position; and a second configuration in which it makes the through-opening (9) accessible;

- 20 the through-opening (9) is arranged and dimensioned such that, when the pushing plate is in the retracted position and the closing element (90) is moved into the second configuration, the optical detecting means (4) are facing towards the through-opening (9) and, through the through-opening (9), face the articles (A) arranged in the detecting region (3), in such a way as to
25 detect the relative identifying code thereof.

6). The device (100) of the preceding claim, wherein, when the pushing plate (81) is in the retracted position and the closing element (90) is in the second configuration, the optical detecting means (4) are at the through-opening (9).

7). The device (100) of claim 5 or 6, further comprising a frame (2) and

5 movement means (94, 95) of the closing element (90); wherein the movement means (94, 95) comprise a fixed part (94) solidly constrained to the frame (2), and a mobile part (95) borne by the pushing plate (81), connected to the closing element (90) and movable with respect to the pushing plate (81) so as to bring the closing element (90) into the relative second configuration; the fixed part (94) and the mobile part (95) being reciprocally arranged and conformed such that when the pushing plate (81) is moved into the relative retracted position, the fixed part (94) contacts and moves the mobile part (95), determining the movement of the closing element (90) into the relative second configuration.

8). The device (100) of the preceding claim, wherein the fixed part (94) of the movement means (94, 95) comprises an abutting element, and the mobile part (95) of the movement means (94, 95) comprises a cam mechanism.

9). The device (100) of any one of the preceding claims from 5 to 8, wherein the closing element (90) is hinged to an edge of the through-opening (9).

10). An identifying and accumulating device (10) of articles (A) provided with an identifying code, comprising:

- a detecting region (3) in which the articles (A) are positioned in a row such that the relative identifying code is arranged at a side (L) of the row;

20 - optical detecting means (4) for detecting the identifying code of the articles (A) when the articles (A) are arranged in the detecting region (3);

25 - an accumulating region (5) in which the articles (A) coming from the detecting region (3) are to be accumulated in order to be successively packed; the detecting region (3) being interposed between the accumulating region (5) and the optical detecting means (4) and being aligned to the accumulating region (5) and to the optical detecting means (4);

- a pusher (8) for pushing the articles (A) from the detecting region (3) to the accumulating region (5), comprising: a connecting arm (80); a pushing plate (81) constrained to the connecting arm (80), which pushing plate (81) is

mobile along from a retracted position, in which the pushing plate (81) is aligned with the optical detecting means (4) and faces a side (L) of the row of articles (A) arranged in the detecting region (3), to an advanced position in which the pushing plate (81) is at the accumulating region (5); and vice versa;

5 the device (10) is characterised in that:

the pushing plate (81) is further mobile with respect to the connecting arm (80) such as to move externally of the straight pathway and thus enable the optical detecting means (4) to face the articles (A) arranged in the detecting region (3), such as to detect the identifying code thereof.

10 11). The device (10) of the preceding claim, wherein the pushing plate (81) is rotatable with respect to the connecting arm (80).

12). The device (10) of claim 10 or 11, further comprising motorisation means, for enabling movement of the pushing plate (81) out of the straight pathway.

15 13). A machine (M) for packing articles (A) provided with an identifying code, comprising an identifying and accumulating device (1, 10, 100) for identifying and accumulating the articles (A) according to any one of the preceding claims.

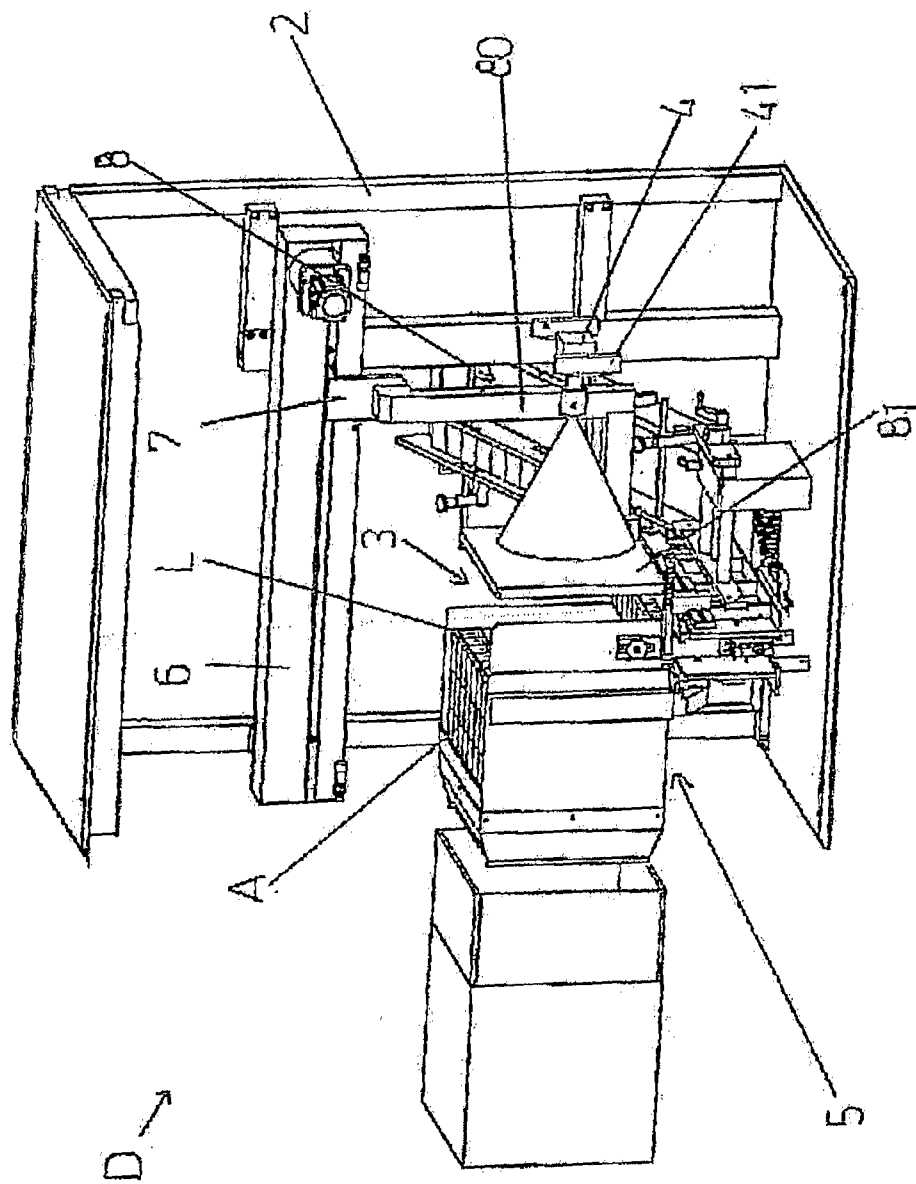


FIG 1

PRIOR ART

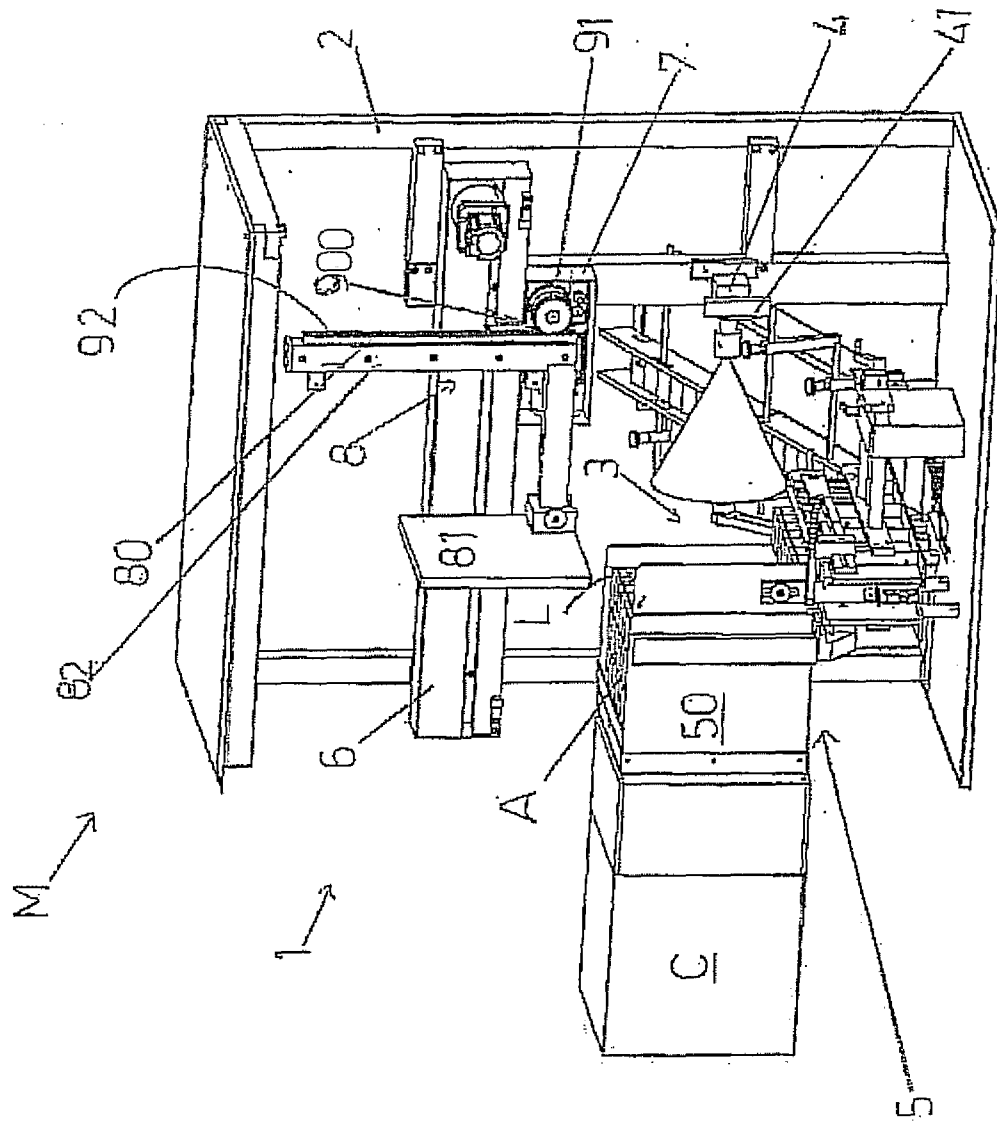


FIG. 2

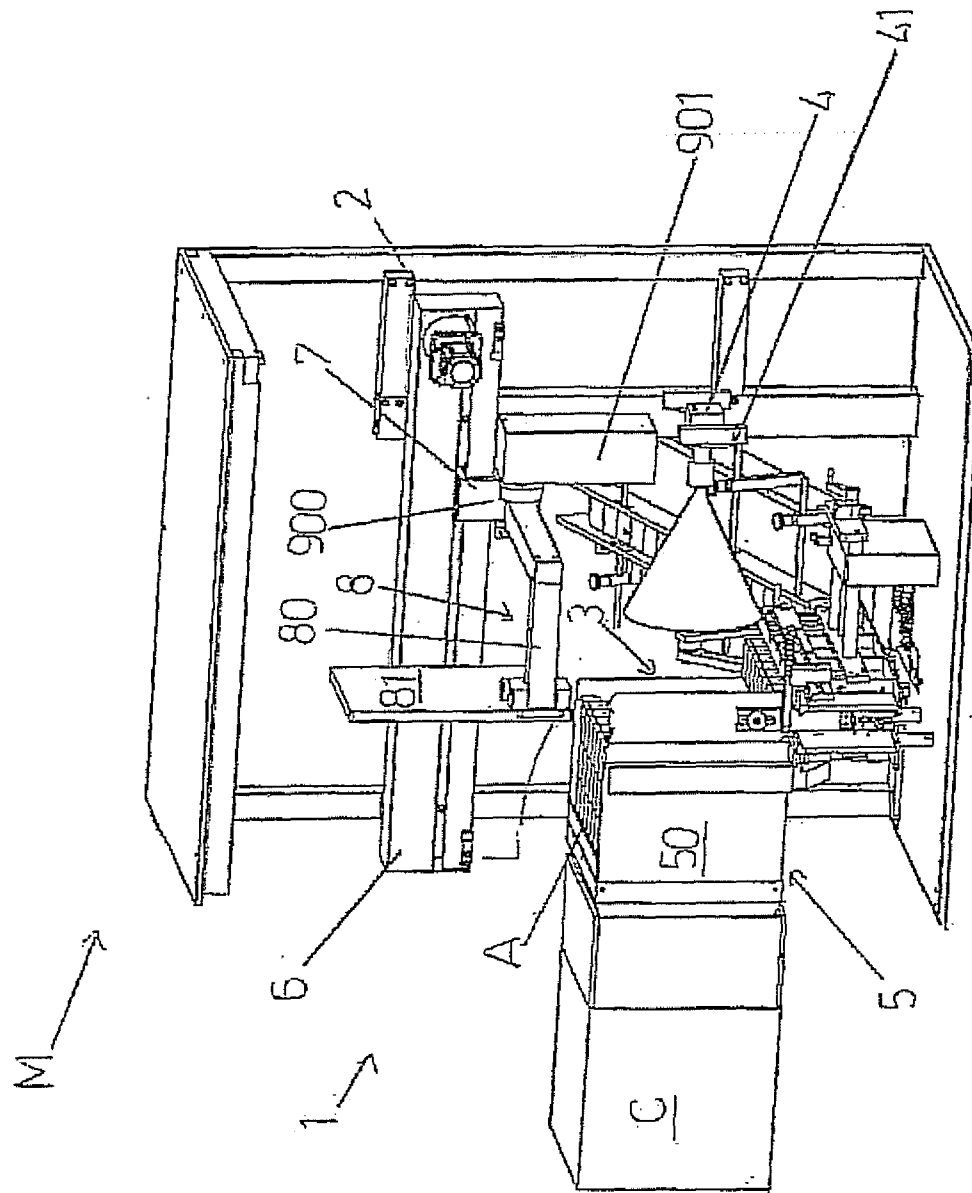


FIG. 3

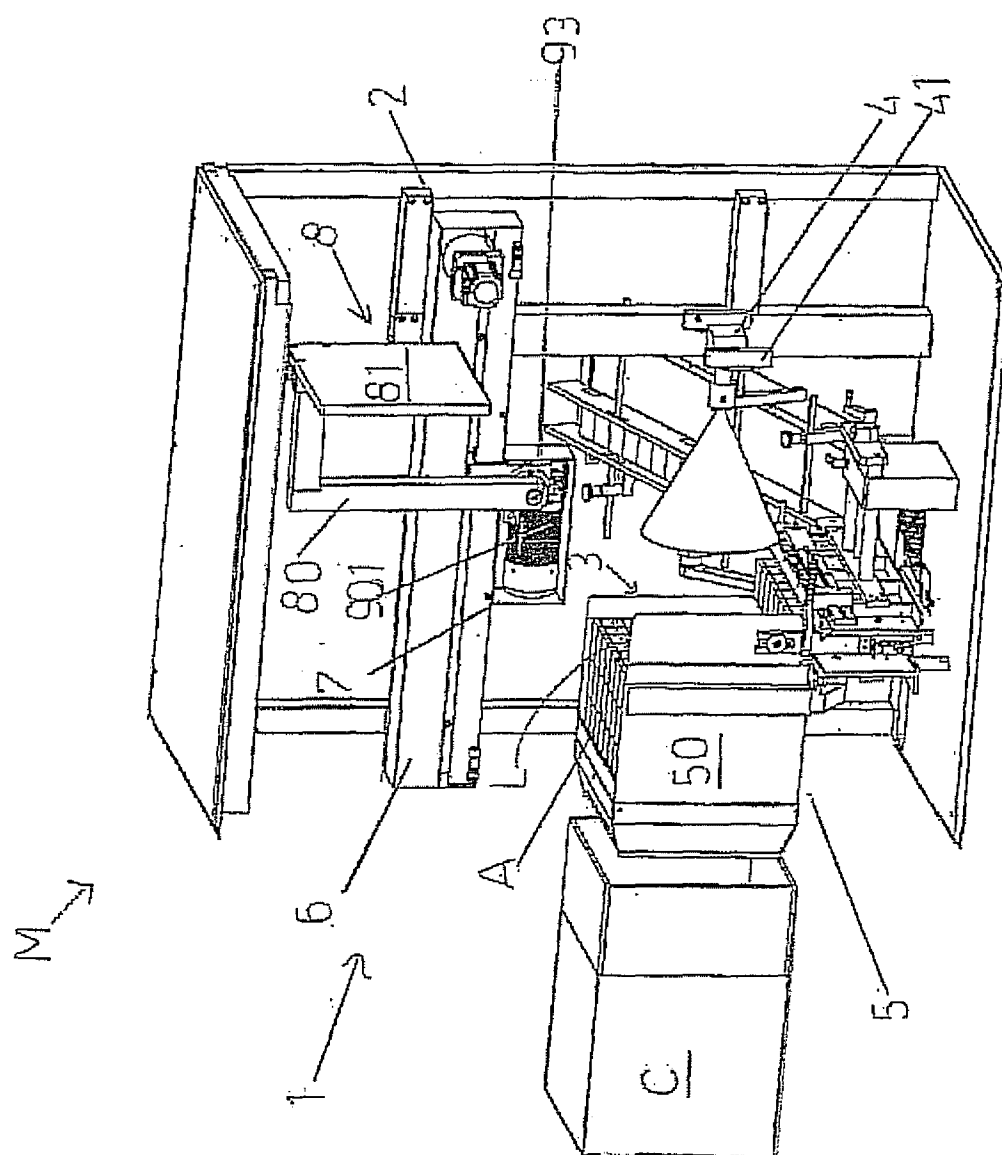
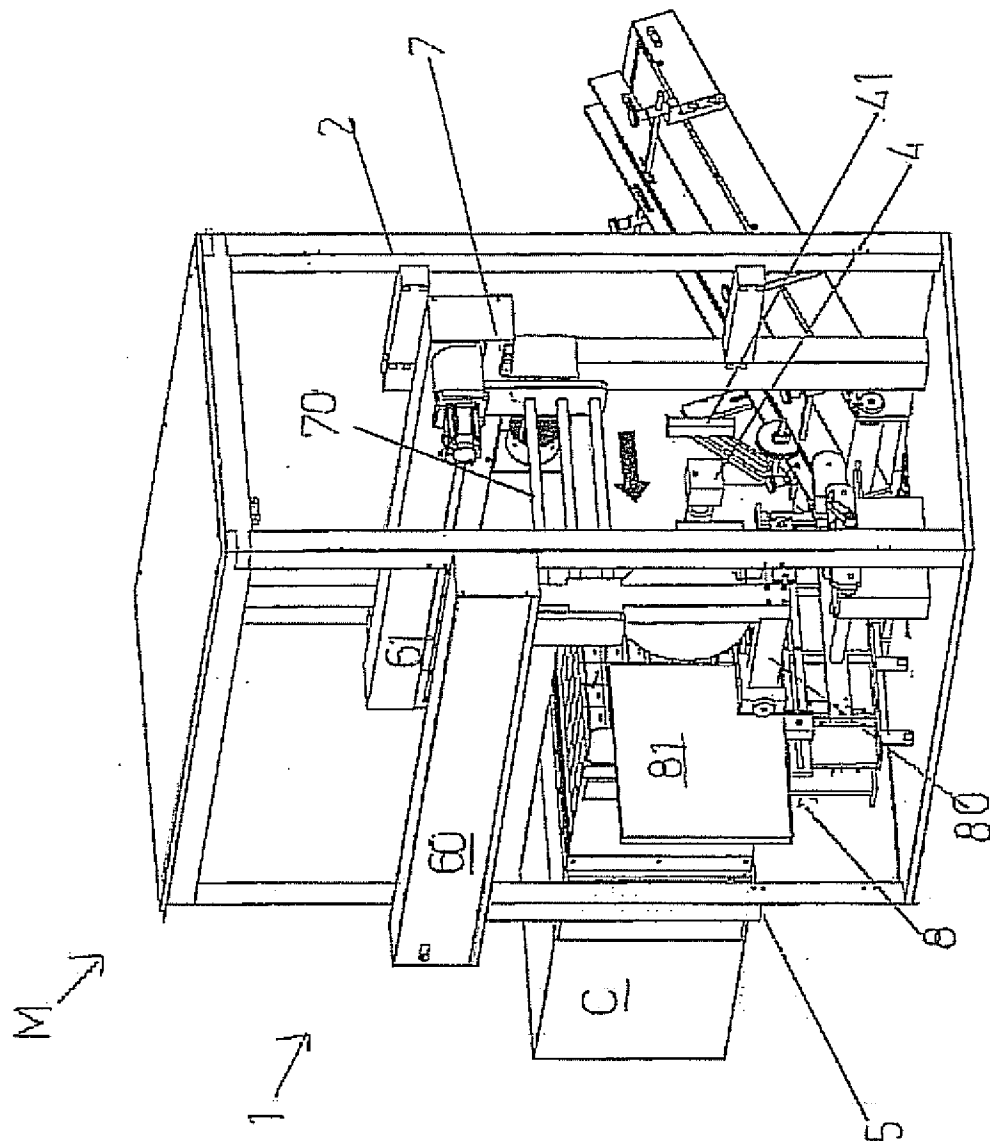
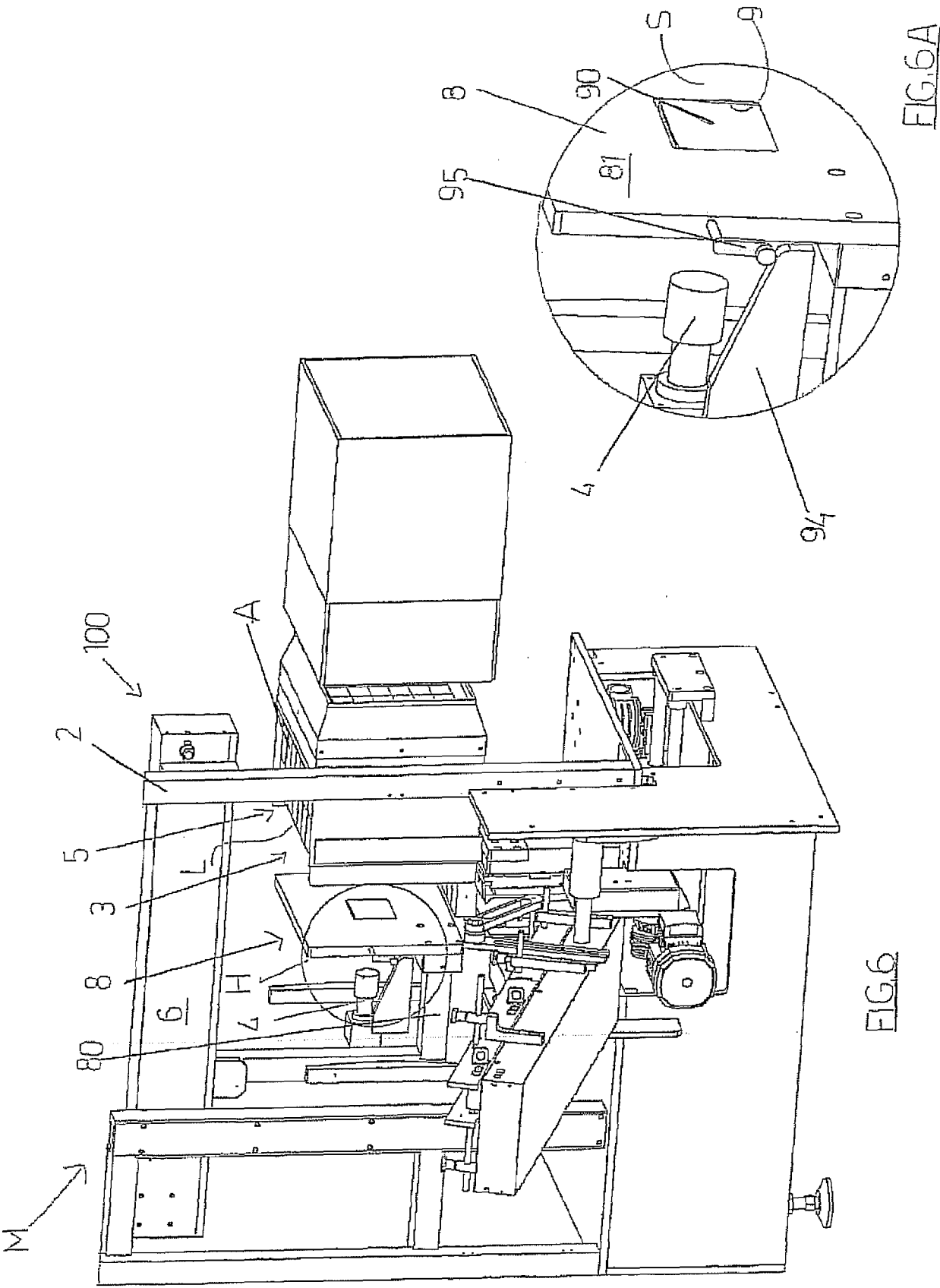
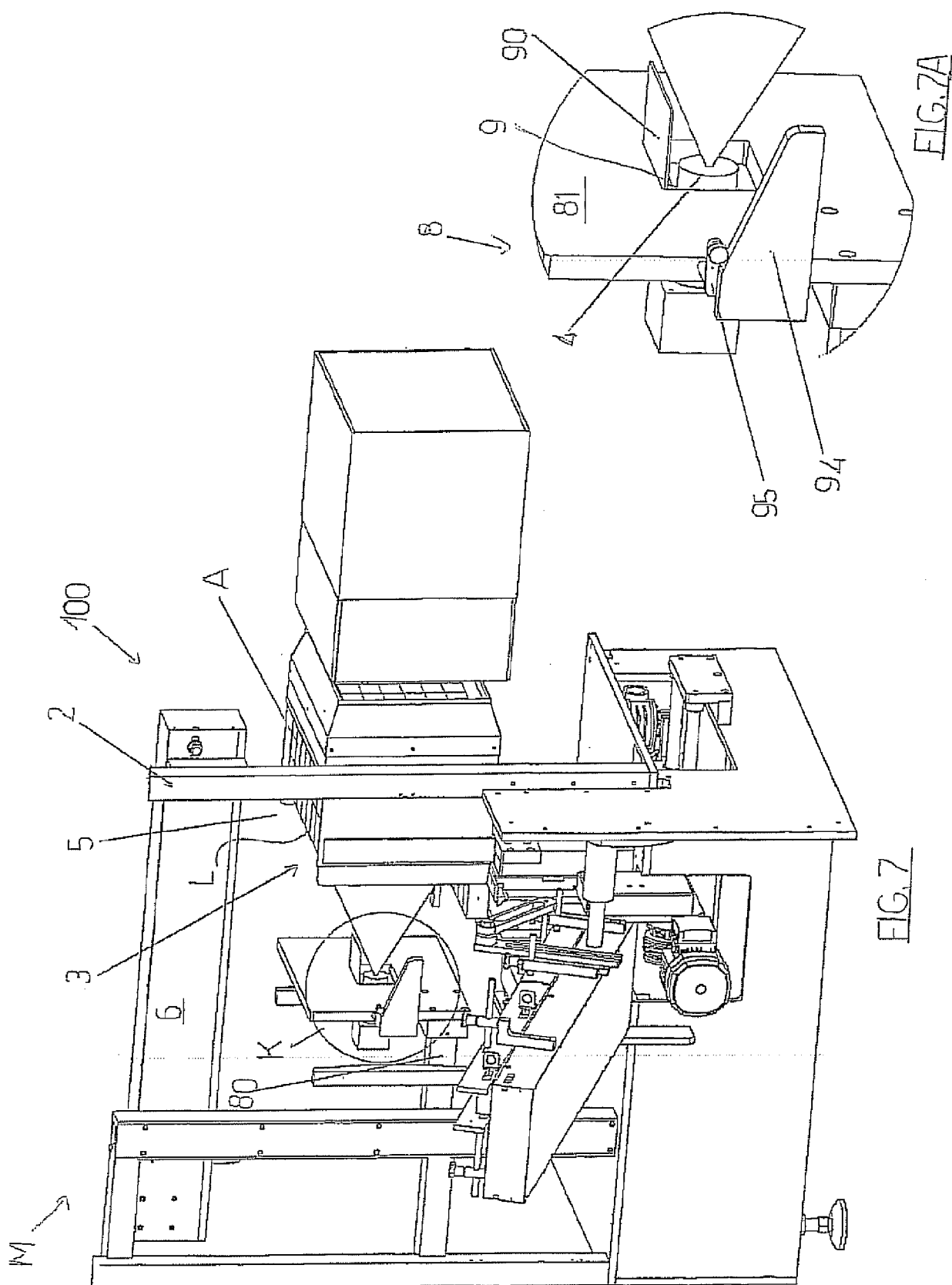
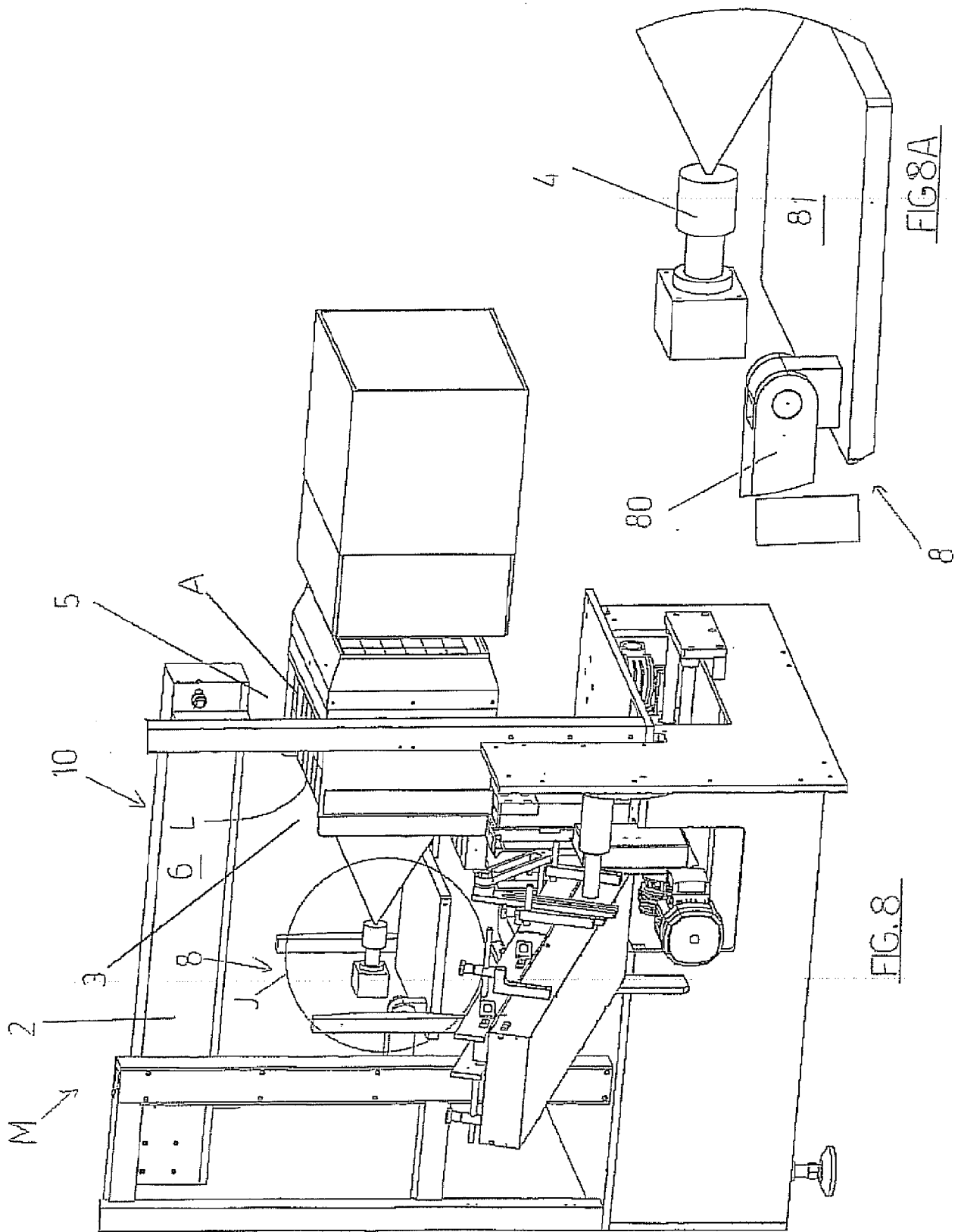


FIG 4

FIG 5







INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/050240

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65B35/40 B65B57/14 B65B65/08 B65B5/10
ADD. B65G47/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65B B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 959 002 A1 (FOCKE & CO [DE]) 24 November 1999 (1999-11-24) figures -----	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

26 March 2015

Date of mailing of the international search report

09/04/2015

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Lawder, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2015/050240

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