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(54) **PACKAGING MACHINE**

(57) A packaging machine for packaging one or more articles in a package; the packaging machine comprising a first article path and a second article path; wherein the packaging machine comprises a first apparatus for packaging articles in a paperboard carton; and a second apparatus for packaging articles in a plastics material; the packaging machine comprising at least one transfer de-

vice for transferring articles between a pair of conveyors to select either the first article path or the second article path; the packaging machine being configurable such that the articles may follow either the first or second article path such that the articles may be packaged in either or both of the paperboard carton and the plastics material.

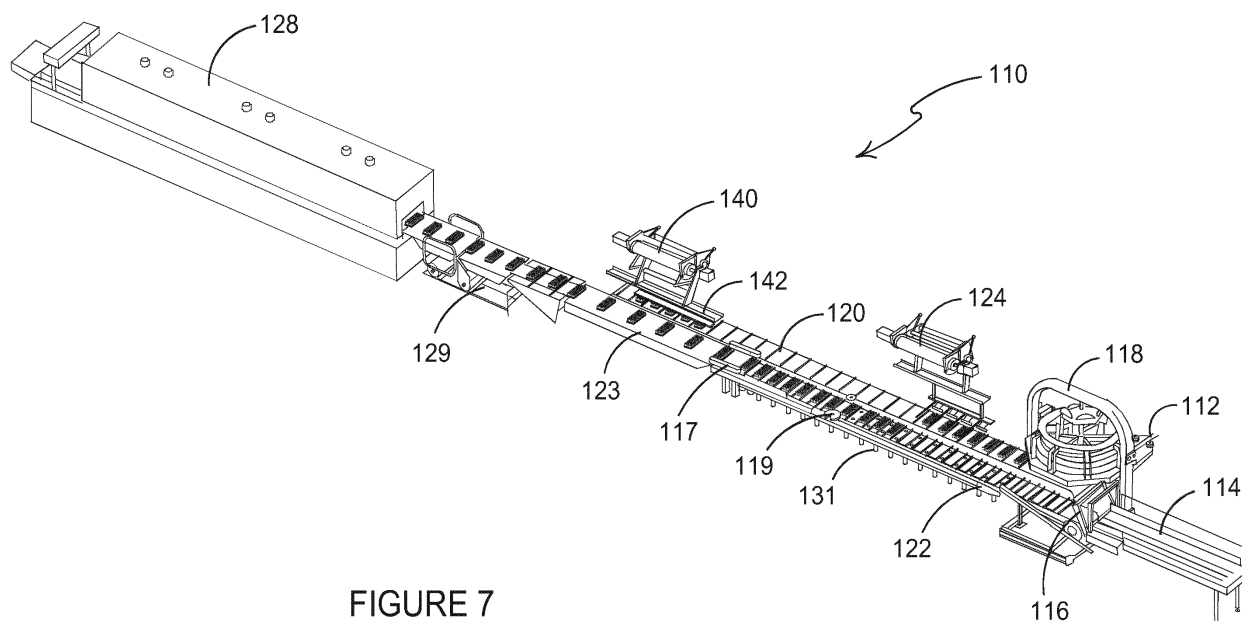


FIGURE 7

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a packaging machine for packing articles in a carton more specifically, but not exclusively, to a packaging machine which is readily adapted to change the carton or package format.

BACKGROUND OF THE INVENTION

[0002] In the field of packaging it is often required to provide consumers with a package comprising multiple primary product containers. Such multi-packs are desirable for shipping and distribution and for display of promotional information. For cost and environmental considerations, such cartons or carriers need to be formed from as little material as possible and cause as little waste in the materials from which they are formed as possible. Another consideration is the strength of the packaging and its suitability for holding and transporting large weights of articles.

[0003] It is desirable to be able to employ a packaging system to automatically place primary product containers in such multi-packs. It is desirable for the packaging machine to be capable of packaging articles in a variety of carton or packaging formats.

SUMMARY OF INVENTION

[0004] The present invention seeks to overcome or at least mitigate the problems of the prior art.

[0005] According to a first aspect of the present invention there is provided a packaging machine for packaging one or more articles in a package;
the packaging machine comprising a first article path and a second article path;
wherein the packaging machine comprises a first apparatus for packaging articles in a paperboard carton;
and a second apparatus for packaging articles in a plastics material;
the packaging machine comprising at least one transfer device for transferring articles between a pair of conveyors to select either the first article path or the second article path;
the packaging machine being configurable such that the articles may follow either the first or second article path such that the articles may be packaged in either, or both, of the paperboard carton and the plastics material.

[0006] According to a second aspect of the present invention there is provided a packaging machine comprising an input conveyor for conveying an input stream of articles;
a first conveyor for conveying cartons on a first article path;
a second conveyor in communication with a wrapping station for applying a wrapping film and conveying articles on a second article path;

a transfer device for transferring the articles on the input conveyor to either the first conveyor or the second conveyor, wherein the transfer device either loads articles into the cartons disposed on the first conveyor or places the articles upon the second conveyor for wrapping and wherein the first conveyor bypasses the wrapping station.

[0007] Optionally, the first conveyor and the second conveyor are each coupled to a third conveyor which merges the first article path and the second article path together such that packages from each article of the first or second paths follow the same path downstream of the third conveyor.

[0008] Optionally, the third conveyor is coupled to a tertiary packaging apparatus for loading packages into a tertiary package.

[0009] In some embodiments, the tertiary packaging machine is coupled to a second wrapping station by a fourth conveyor, such that the tertiary package or packages are wrapped in a film of plastics material.

[0010] According to a third aspect of the present invention there is provided a packaging machine for packaging one or more articles in a package,
the packaging machine comprising a first article path and a second article path;

wherein the packaging machine comprises a first conveyor supplying an input stream of articles;
a second conveyor including a carton packaging apparatus for packaging articles in a paperboard carton, and a wrapping apparatus for wrapping articles or cartons in a plastics material;

a first transfer device for loading articles into cartons on the second conveyor, the first conveyor being arranged such that articles may bypass the carton packaging apparatus; and

a second transfer device for transferring articles to the second conveyor at a position downstream of the carton packaging apparatus such that articles may be initially packaged in a film of plastics material.
[0011] Within the scope of this application it is envisaged that the various aspects, embodiments, examples, features and alternatives set out in the preceding paragraphs, in the claims and/or in the following description and drawings may be taken independently or in any combination thereof. For example, features described in connection with one embodiment are applicable to all embodiments unless there is incompatibility of features.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view from above of a packaging system according to a first embodiment of the invention;

FIGURE 2 is a perspective view from above of a packaging machine according to a first embodiment

of the invention;

FIGURE 3 is a perspective view from above of the packaging machine of Figure 2 loading articles into cartons to form a first packaging format;

FIGURES 4, 5 and 6 are a perspective views from above of the packaging machine of Figure 2 loading articles into cartons to form a second packaging format;

FIGURE 7 is a perspective view from above of a packaging machine according to a second embodiment of the invention;

FIGURES 8 and 9 are perspective views from above of the packaging machine of Figure 7 loading articles into cartons to form a third packaging format;

FIGURES 10 and 11 are perspective views from above of the packaging machine of Figure 7 loading articles into cartons to form a fourth packaging format;

FIGURES 12 and 13 are perspective views from above of the packaging machine of Figure 7 loading articles into cartons to form a fifth packaging format; and

FIGURES 14 and 15 are perspective views from above of the packaging machine of Figure 7 loading articles into cartons to form a sixth packaging format.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0013] Detailed descriptions of specific embodiments of the packaging machine, packages, blanks and cartons are disclosed herein. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the invention can be implemented and do not represent an exhaustive list of all of the ways the invention may be embodied. As used herein, the word "exemplary" is used expansively to refer to embodiments that serve as illustrations, specimens, models, or patterns. Indeed, it will be understood that the packaging machine, packages, blanks and cartons described herein may be embodied in various and alternative forms. The Figures are not necessarily to scale and some features may be exaggerated or minimised to show details of particular components. Well-known components, materials or methods are not necessarily described in great detail in order to avoid obscuring the present disclosure. Any specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the invention.

[0014] Referring to Figure 1 there is shown a perspective view of a packaging system 9 capable of accepting an input of primary products such as, but not limited to, bottles or cans, hereinafter referred to as articles.

[0015] In the embodiments detailed herein, the terms "carton" and "carrier" refer, for the non-limiting purpose of illustrating the various features of the invention, to a

container for engaging, carrying, and/or dispensing articles, such as bottles. However, it is contemplated that the teachings of the invention can be applied to various containers, which may or may not be tapered and/or cylindrical. Other exemplary articles include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

[0016] The primary products may be packaged in cartons, which cartons are formed from a blank.

[0017] The blank is formed from a sheet of a suitable substrate. It is to be understood that, as used herein, the term "suitable substrate" includes all manner of foldable sheet material such as paperboard, corrugated board, cardboard, plastic, combinations thereof, and the like. It should be recognized that one or other numbers of blanks may be employed, for example, to provide the carrier structure described in more detail below.

[0018] The packaging system 9 comprises a packaging machine 10 as shown in Figures 2 and 3, the packaging machine 10 having an input conveyor 12, which provides an input stream of articles A, for example in two columns disposed side by side. Figures 1 to 3 illustrate the packaging machine 10 in a first mode of operation.

[0019] A transfer device 18 transfers the articles A from the input conveyor 12 to a first conveyor 20. The transfer device 18 creates article groups of a predetermined size. The groups of articles A are each placed upon the first conveyor 20 at predefined pitch intervals such that the article groups are metered.

[0020] The packaging machine 10 comprises a first hopper 14 which holds blanks for forming cartons. The first hopper 14 is coupled to a feeder 16, which places carton blanks upon a second conveyor 22. The carton blanks are erected into a tubular form, for example by the feeder 16 or by a separate device. The erected cartons C are each placed, between lugs 31, upon the second conveyor 22 at predefined pitch intervals such that the erected cartons C are metered. The pitch of the cartons C is arranged so as to match the pitch of the article groups.

[0021] A loading device 24 loads the cartons C with articles A. The loading device 24 comprises a first tool head 25 for handling the articles A. The loading device 24 slides each article group into a respective carton C; in doing so, the loading device 24 transfers the articles A from the first conveyor 20 to the second conveyor 22. The article groups are continuously moving in a downstream direction, indicated by direction arrow D2, whilst being slid from the first conveyor 20 to the second conveyor 22 as indicated by direction arrow D3. The speed of the second conveyor 22 is matched to the speed of the first conveyor 20 such that the cartons C disposed upon the second conveyor 22 and the articles A disposed upon the first conveyor 20 move in the downstream direction synchronously.

[0022] The open ends of the cartons C are closed by a closing device 19 which folds end closure panels to close the open ends. The end closure panels are secured

in place, for example with glue or other adhesive treatment, and pass between a pair of belts 17 which apply pressure to the end closure panels to ensure a secure bond.

[0023] The cartons C are then conveyed upon a third conveyor 30 to a subsequent processing station. The third conveyor 30 bypasses a processing station 28/29 coupled to a fourth conveyor 26. The fourth conveyor 26 is disposed in parallel to the first conveyor 20 and is disposed adjacent thereto. The fourth conveyor 26 is disposed on a first side of the first conveyor 20. The second conveyor 22 is disposed on a second side of the first conveyor 20; the second side opposes the first side. The second conveyor 22 is disposed in parallel to the first and fourth conveyors 20, 26. In the first mode of operation the processing station 28/29 is not employed to package articles A and therefore the processing station 28/29 and fourth conveyor 26 may be idle or dormant.

[0024] Figures 4, 5 and 6 illustrate the packaging machine 10 in a second mode of operation. In this mode of operation the second conveyor 22 is idle; the feeder 16 is idle and does not feed carton blanks onto the second conveyor 22. The loading device 24 picks up the article groups from the first conveyor 20 and places the article groups upon the fourth conveyor 26. The loading device 24 is arranged to move the articles A downstream, as indicated by the direction arrow D2, whilst simultaneously moving the article groups from the first conveyor 20 to the fourth conveyor 26. In the second mode of operation the loading device 24 employs a second tool head 27 adapted for picking up the articles A. Upon depositing articles A upon the fourth conveyor 26, the loading device 24 returns to the first conveyor 20, as indicated by direction arrow D5 in Figure 6, to an upstream position to gather further articles A from the first conveyor 20. Once disposed upon the fourth conveyor 26, the articles A are conveyed to a wrapping station 29. The article groups are wrapped in a film or sheet of material so as to retain the articles of each group of articles A together as a cohesive unit. Preferably, the film is shrink wrap material formed from a polymer plastics material such as, but not limited to, polyolefins, for example polyethylene or polypropylene, or polyvinyl chloride (PVC). The wrapped article groups are then conveyed to a shrinking station 28 which treats the film or sheet of material to tighten it about each article group. In the preferred embodiment the film is shrunk by the application of heat thereto; however, in other embodiments, other treatments may be applied to the film. In the illustrated embodiment the second tool head 27 is configured to pick up articles from the first conveyor 20 upon which they are arranged in metered groups of 12 articles arranged in a 2x6 configuration. The second tool head 27 separates each 2x6 group of articles into three groups of 2x2 articles each spaced apart from one another when placed upon the fourth conveyor 26.

[0025] The packaging system 9 comprises a fifth conveyor 32; fifth conveyor 32 is coupled to the third conveyor 30 and to the fourth conveyor 26 which passes

through the shrinking station 28. The fifth conveyor 32 is wide enough to receive packages (either articles A wrapped in film, or articles A packaged into cartons C) from either the third conveyor 30 or the fourth conveyor 26. The fifth conveyor 32 is coupled to a sixth conveyor 34. The sixth conveyor 34 is narrower than the fifth conveyor 32 and is substantially aligned with the fourth conveyor 26 such that packages deposited on the fifth conveyor 32 by the fourth conveyor 26 can be deposited upon the sixth conveyor 34 without moving the packages in a direction transverse to the direction of travel of the fifth conveyor 32. In other words, an upstream end of the sixth conveyor 34 is co-linear with a downstream end of the fourth conveyor 26.

[0026] The fifth conveyor 32 conveys packages received from the fourth conveyor 26 in a downstream direction only, which is parallel to the direction of travel of the fifth conveyor 32. The fifth conveyor 32 comprises fixed guides which direct packages received from the third conveyor 30 in a downstream direction, parallel to the direction of travel of the fifth conveyor 32, and also moves the packages in a transverse direction such that they may be deposited upon the sixth conveyor 34. It will be appreciated that the packaging machine 10 comprises two paths which the articles A may travel upon or follow depending upon the desired packaging format. The first path passes through the shrinking station 28, the second path bypasses the shrinking station 28. Thus packaging machine 10 comprises two distinct, spaced apart, exit locations for the packages. The sixth conveyor 32 thus merges the two distinct paths of the packages, such that the location from which the packages exit the fifth conveyor 32 is the same irrespective of whether the articles A followed the first or second path.

[0027] In this way the cartons C which are received from the third conveyor 30 are moved in a direction transverse to the direction of travel whilst being conveyed downstream, such that the packages debark from the fifth conveyor 32 at the same position irrespective of whether the packages are supplied to the fifth conveyor 32 by the third conveyor 30 or the fourth conveyor 26.

[0028] The sixth conveyor 34 conveys packages to a tertiary packaging machine 38 which applies a tertiary package R to the secondary packages P, if desired. The tertiary packing machine 38 may group one or more secondary packages P together for packaging in the tertiary package R.

[0029] The tertiary packages R or secondary packages P (if no tertiary package is applied) are then conveyed to a second wrapping station 43 and a second shrinking station 42. The tertiary packages R or secondary packages P may be grouped together by a second grouping device 41 which is arranged substantially the same as grouping station 23. In this way the packages P may be further packaged in either, or both, of a tertiary package R (such as a tray) and a film material. Referring now to Figures 7 to 15, there is shown an alternative embodiment of the present invention. In the second illustrated

embodiment, like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "100" to indicate that these features belong to the second embodiment. The alternative embodiments share many common features with the first embodiment and therefore only the differences from the embodiment illustrated in Figures 1 to 6 will be described in any greater detail.

[0030] The packaging machine 110 comprises an input conveyor 112, which provides an input stream of articles A, for example in two columns disposed side by side. A transfer device 118 transfers the articles from the input conveyor 112 to a first conveyor 120. The transfer device 118 creates article groups of a predetermined size. The groups of articles A are each placed upon the first conveyor 120 at predefined pitch intervals such that the article groups are metered.

[0031] The packaging machine 110 comprises a first hopper 114 which holds blanks for forming cartons such as trays. The first hopper 114 is coupled to a feeder 116 which places carton blanks upon a second conveyor 122. The carton blanks are erected into a U-shaped form, for example by the feeder 116 or by a separate device. The erected cartons C are each placed, between lugs 131, upon the second conveyor 122 at predefined pitch intervals such that the erected cartons C are metered. The pitch of the cartons C is arranged so as to match the pitch of the article groups.

[0032] In a first mode of operation, illustrated in Figures 7 to 9 the cartons C are trays. A loading device 124 loads the cartons C with articles A; the loading device 124 comprises a first tool for handling the articles A. The loading device 124 slides each article group into a respective tray; in doing so the loading device 124 transfers the articles A from the first conveyor 120 to the second conveyor 122. The article groups are continuously moving in a downstream direction whilst being slid from the first conveyor 120 to the second conveyor 122. The speed of the second conveyor 122 is matched to the speed of the first conveyor 120 such that the trays upon the second conveyor 122 and the articles A upon the first conveyor 120 move in the downstream direction synchronously.

[0033] The packaging machine 110 comprises a grouping and transfer device 140 disposed downstream from the loading device 124. In the first mode of operation, the grouping and transfer device 140 is idle. The transfer device 118 creates article groups of 24 articles arranged in a 4x6 array. Each group of articles A are transferred, in the 4x6 array, to a tray.

[0034] Once the tray is loaded with articles A the ends of the tray, which comprise end closure panels, are closed by the closing device 119 which folds the end closure panels. The end closure panels are secured with adhesive or other suitable treatment. The trays pass between a pair of rollers 117 disposed on opposing sides of the second conveyor 122 which apply a force to each end of the tray to secure the end closure panels in place.

[0035] The trays of articles A then pass to a wrapping

station 129 which wraps the trays and articles A in a film or sheet of material. The wrapped trays of articles A are then conveyed to a shrinking station 128. The shrinking station 128 applies heat or other suitable treatment to shrink the film or sheet of material about the trays of articles A.

[0036] Figures 10 and 11 illustrate the packaging machine 110 in a second mode of operation. In this mode articles A are conveyed upon the first conveyor 120 to the grouping and transfer device 140. The grouping and transfer device 140 comprises a tool head 142. Only the tool head 142 is shown in Figures 10 and 11 for clarity.

[0037] The loading device 124, in the second mode of operation, is idle. The transfer device 140 places articles A upon the first conveyor 120 in metered groups of ten articles arranged in a 2x5 array. In other embodiments other article configurations are envisaged, for example but not limited to, eight articles A arranged in a 2x4 array or twelve articles A arranged in a 2x6 array.

[0038] The tool head 142 of the grouping and transfer device 140 picks up ten groups of articles A from separate pitches upon the first conveyor 120. The tool head 142 is configured so that the five groups of articles A at the upstream end of the tool head 142 are placed upon the second conveyor 122 in a first lane L1, and the five groups of articles A at the downstream end of the tool head 142 are placed upon the second conveyor 122 in a second lane L2. The five groups of articles A at the upstream end of the tool head 142 are placed upon the second conveyor 122 at a position which is upstream of the five groups of articles A at the downstream end of the tool head 142 as indicated by phantom line T, which shows the position upon the second conveyor 122 where the ten groups of articles A picked up from the first conveyor 120 are placed.

[0039] The tool head 142 is additionally configured to move upstream and downstream, such that it can move downstream in synchrony with the first conveyor 120 as it picks up the articles A. The tool head 142 continues to move downstream, as indicated by direction arrow D8, as it deposits the articles A upon the second conveyor 122, at this time the tool head 142 moves downstream in synchrony with the second conveyor 122. Once the tool head 142 has deposited the articles A upon the second conveyor 122 it moves upstream to collect further groups of articles A from the first conveyor 120.

[0040] The two lanes L1, L2 of articles A are conveyed upon the second conveyor 122 to the wrapping station 129 which wraps the groups of articles A in each lane L1, L2 with a film of material. The wrapped groups are then conveyed to the shrinking station 128.

[0041] Figures 12 and 13 illustrate the packaging machine 110 in a third mode of operation. In this mode articles A are conveyed upon the first conveyor 120 to the grouping and transfer device 140. The grouping and transfer device 140 comprises a second tool head 144; only the tool head 144 is shown in Figures 12 and 13 for clarity.

[0042] The second tool head 144 is adapted to pick up five groups of twenty-four articles A arranged in a 4x6 array. The groups of articles A are transferred to the second conveyor 122 as indicated by direction arrow D7. The groups of articles A are placed upon the second conveyor 122, which then conveys the groups of articles A to the wrapping station 129 where the groups of articles A are wrapped in film. Subsequently the groups of articles A are conveyed to the shrinking station 128 which tightens the film about the groups of articles A.

[0043] Figures 14 and 15 illustrate the packaging machine 110 in a fourth mode of operation. In this mode articles A are conveyed upon the first conveyor 120 to the loading device 124. The loading device 124 comprises a tool head adapted to slide the articles A from the first conveyor 120 into the carton C being conveyed upon the second conveyor 122.

[0044] As shown in Figure 7, the packaging machine 110 comprises the first hopper 114 which holds blanks for forming cartons. The hopper 114 is coupled to the feeder 116 which places carton blanks upon a second conveyor 122. The carton blanks are erected into a tubular form, for example by the feeder 116 or by a separate device. The erected cartons C are each placed, between lugs 131, upon the second conveyor 122 at predefined pitch intervals such that the articles groups are metered. The pitch of the cartons C is arranged so as to match the pitch of the article groups. The loading device 124 slides each article group into a respective erected carton C. In doing so the loading device 124 transfers the articles A from the first conveyor 120 to the second conveyor 122.

[0045] The open ends of the cartons C are closed by a closing device 119 which folds end closure panels to close the open ends; the end closure panels are secured in place, for example with glue or other adhesive treatment, and pass between a pair of belts 117 which apply pressure to the end closure panels to ensure a secure bond.

[0046] The cartons C are then conveyed downstream upon the second conveyor 122 to a grouping mechanism 123. The grouping mechanism 123 comprises a conveyor and flight bars, the flight bars moving at a different speed to the conveyor. The grouping mechanism 123 groups together a number of cartons C; in the illustrated embodiment two cartons C are grouped together. A first carton C is transferred onto the conveyor of the grouping mechanism 123 and is conveyed at a first speed by the conveyor. A second carton is then transferred onto the conveyor, the second carton C being spaced apart from the first carton C. A flight bar moving at a second speed, faster than the first speed of the conveyor, then engages with the upstream end of the second carton C pushing it downstream, at the second speed, over the conveyor surface until it engages or contacts with the first carton C such that the flight bar pushes both first and second cartons C, downstream now at the second speed, over the conveyor until they are disposed upon the wrapping station. Preferably, the flight bars convey the cartons C

downstream at a speed substantially equal to the speed at which the second conveyor 122 conveys the articles A downstream.

[0047] The wrapping station 129 wraps the grouped cartons in film to hold them together. The wrapped carton groups are then conveyed to the shrinking station 128 where the film is treated so as to tighten it about grouped cartons C. In this way a plurality of cartons C can be held together as a single unit.

[0048] The packaging machine 110 shown in Figures 7 to 15 may replace the packaging machine 10 of Figures 1 to 6 to form an alternative packaging system. The downstream end of the shrinking station 128 may be coupled to the sixth conveyor 34 such that further packaging operations may be carried out upon the packages produced by the packaging machine 110.

[0049] It can be appreciated that various changes may be made within the scope of the present invention. For example, the size and shape of the panels and apertures may be adjusted to accommodate articles of differing size or shape.

[0050] It will be recognised that as used herein, directional references such as "top", "bottom", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another.

[0051] As used herein, the terms "hinged connection" and "fold line" refer to all manner of lines that define hinge features of the blank, facilitate folding portions of the blank with respect to one another, or otherwise indicate optimal panel folding locations for the blank. A fold line is typically a scored line, an embossed line, or a debossed line. Any reference to "hinged connection" or "fold line" should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from any one or more of the following: a short slit, a frangible line or a fold line without departing from the scope of the invention.

[0052] As used herein, the term "severance line" refers to all manner of lines that facilitate separating portions of the substrate from one another or that indicate optimal separation locations. Severance lines may be frangible or otherwise weakened lines, tear lines, cut lines, or slits.

[0053] It should be understood that hinged connection, severance lines and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cut line, an interrupted cut line, slits, scores, any combination thereof, and the like. The elements can be dimensioned and arranged to provide the desired functionality. For example, a line of perforations can be dimensioned or designed with degrees of weakness to define a fold line and/or a severance line. The line of perforations can be designed to facilitate folding and resist breaking, to facilitate folding and facilitate breaking with more effort, or to facilitate breaking with little effort.

Claims

1. A packaging machine for packaging one or more articles in a package,
the packaging machine comprising a first article path 5
and a second article path;
wherein the packaging machine comprises a first
conveyor supplying an input stream of articles;
a second conveyor including a carton packaging ap- 10
paratus for packaging articles in a paperboard car-
ton, and a wrapping apparatus for wrapping articles
or cartons in a plastics material;
a first transfer device for loading articles into cartons
on the second conveyor, the first conveyor being ar- 15
ranged such that articles may bypass the carton
packaging apparatus; and
a second transfer device for transferring articles to
the second conveyor at a position downstream of
the carton packaging apparatus such that articles 20
may be initially packaged in a film of plastics material.

2. A packaging machine according to claim 1 wherein
the first conveyor and the second conveyor are each
coupled to a third conveyor which merges the first 25
article path and the second article path together such
that packages from each article of the first or second
paths follow the same path downstream of the third
conveyor.

3. A packaging machine according to claim 2 wherein 30
the third conveyor is coupled to a tertiary packaging
apparatus for loading packages into a tertiary pack-
age.

4. A packaging machine according to claim 3 wherein 35
the tertiary packaging machine is coupled to a sec-
ond wrapping station by a fourth conveyor, such that
the tertiary package or packages are wrapped in a
film of plastics material.

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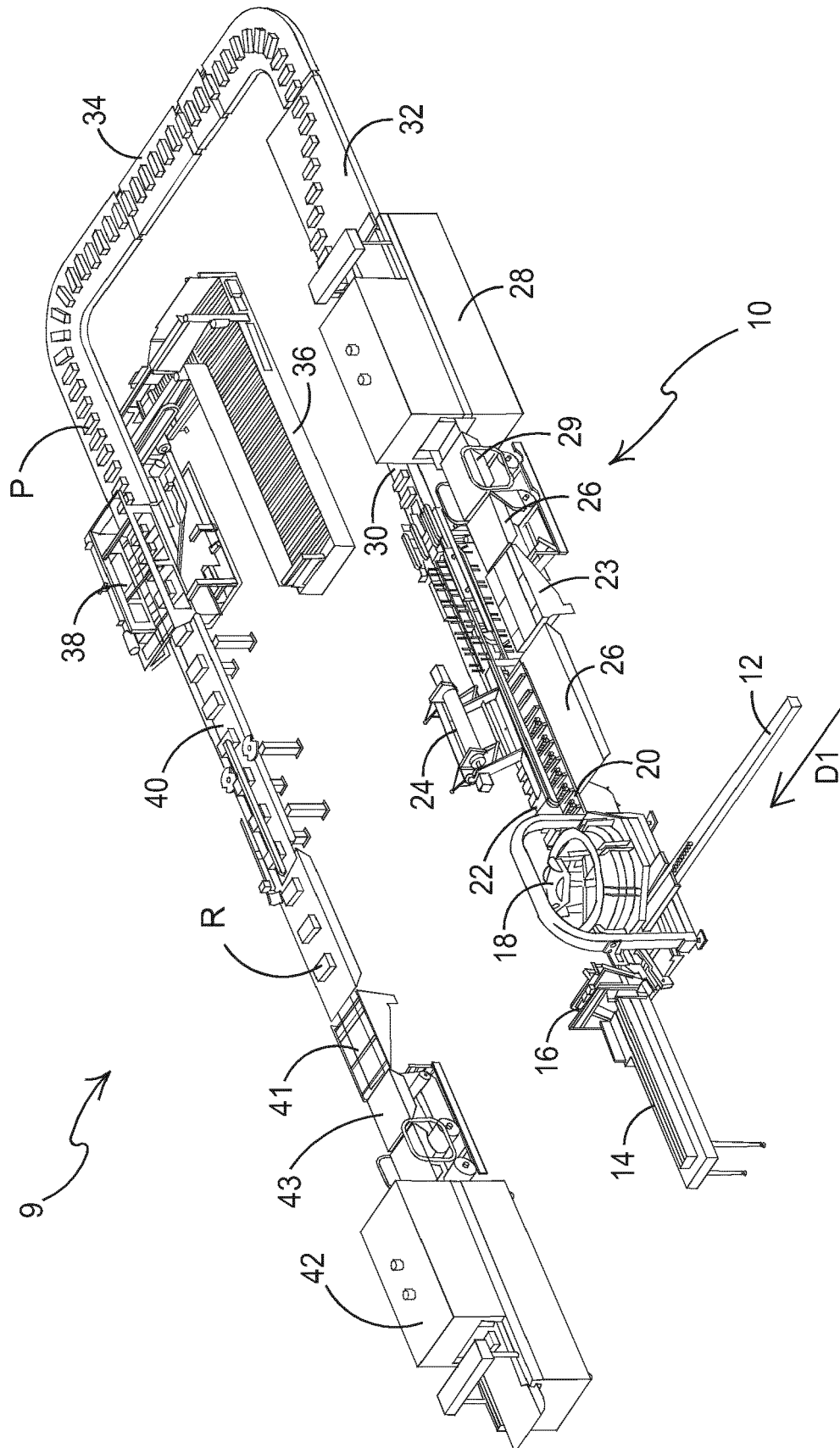


FIGURE 1

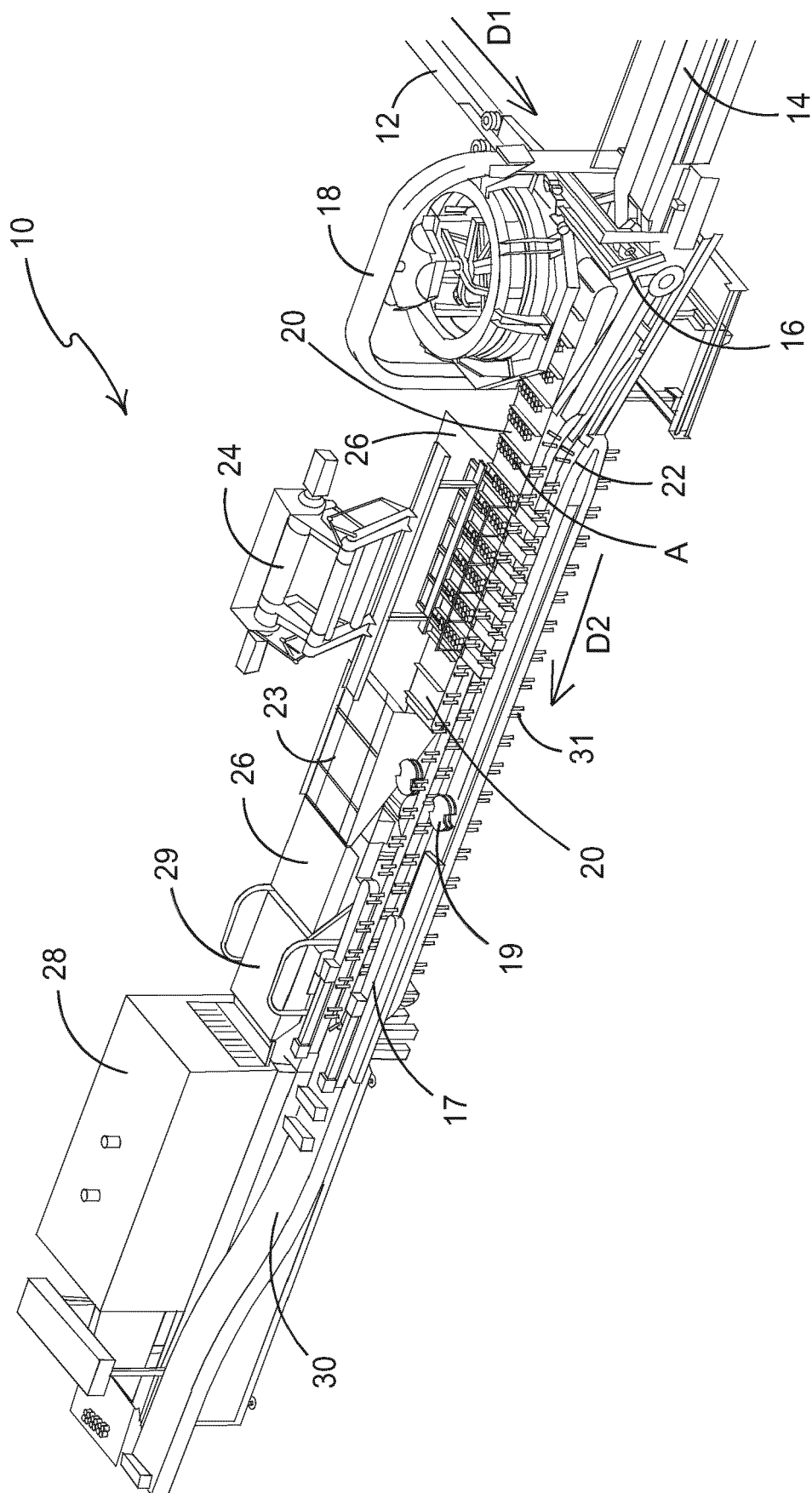


FIGURE 2

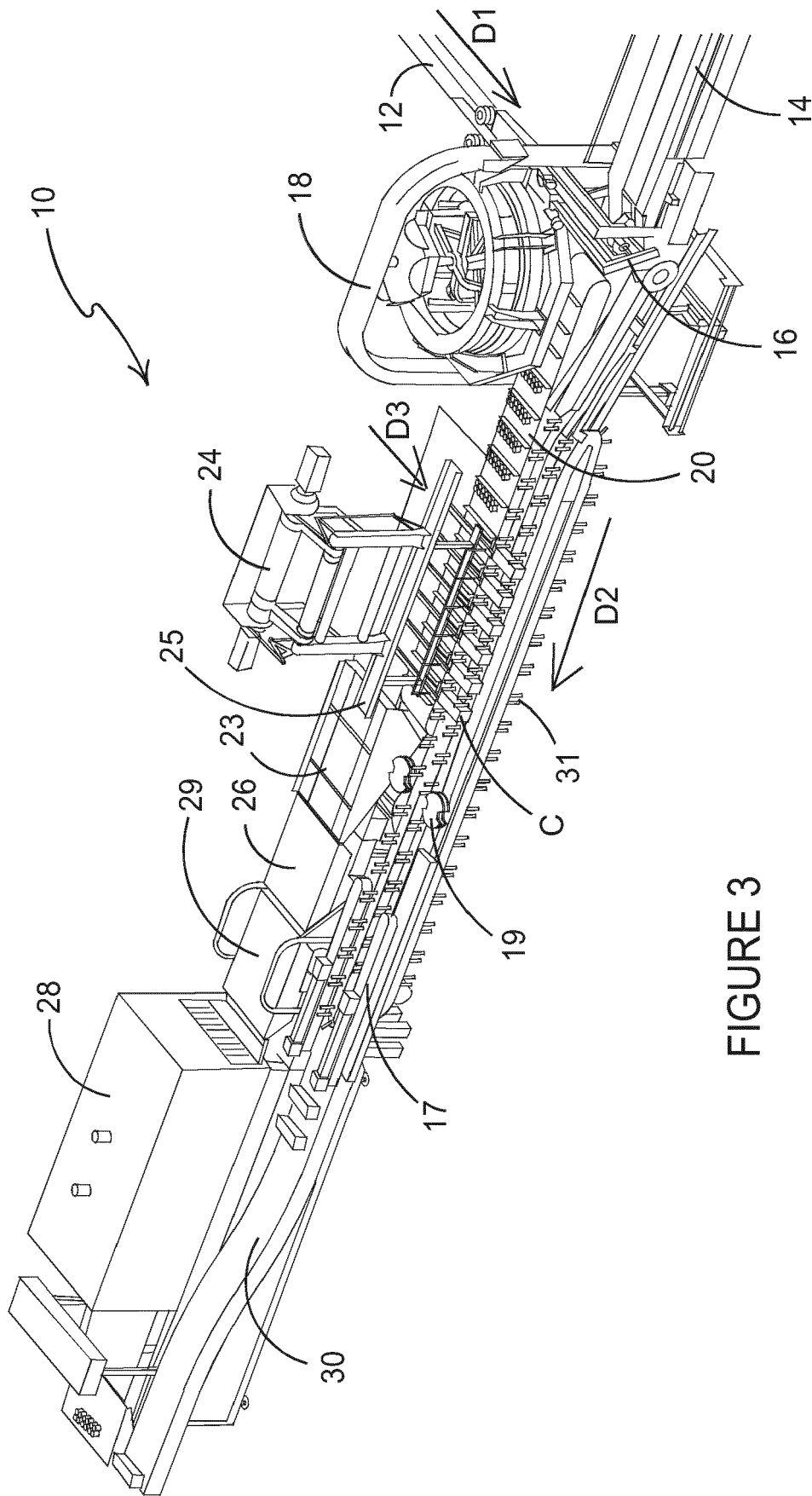


FIGURE 3

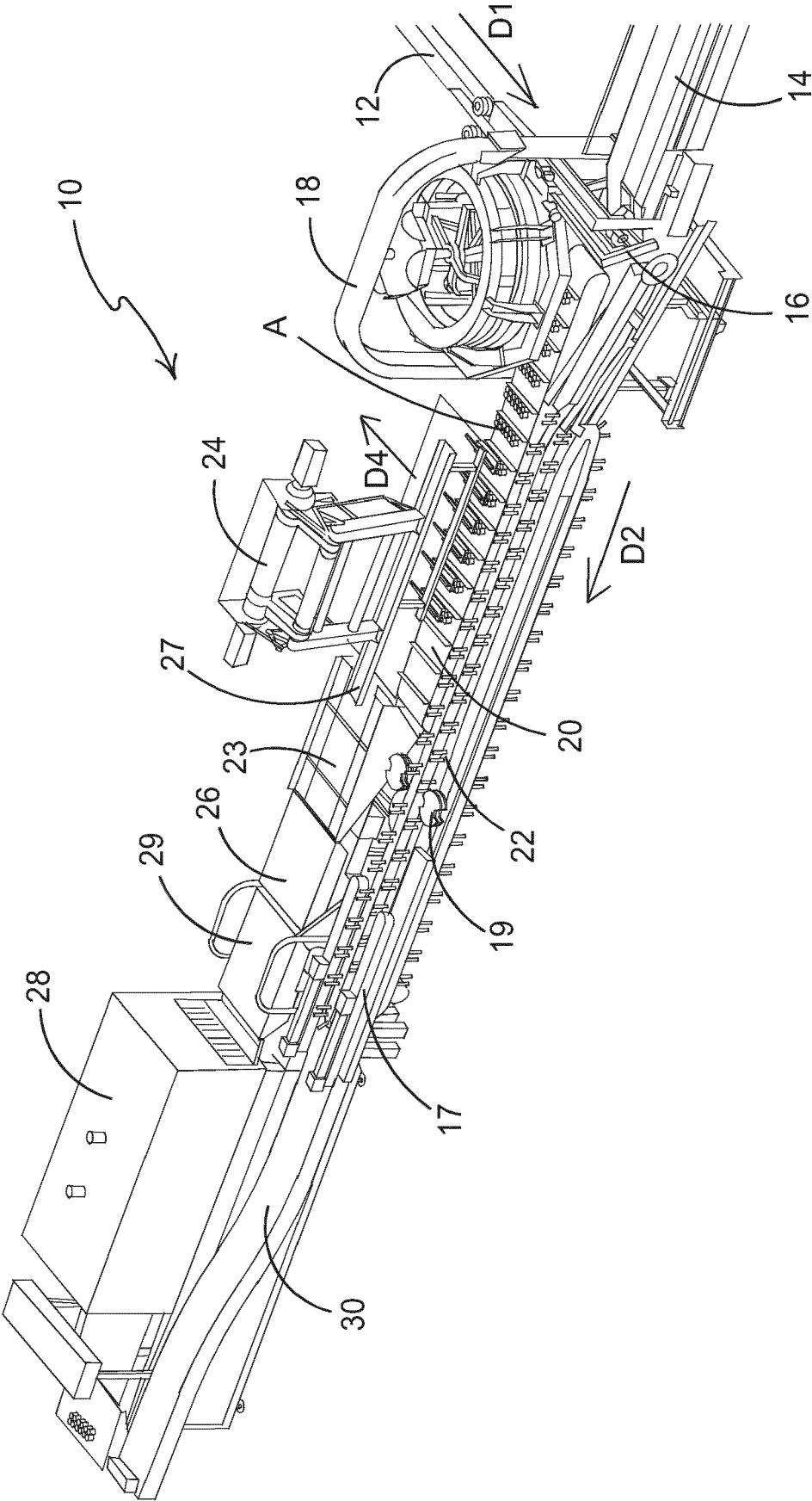


FIGURE 4

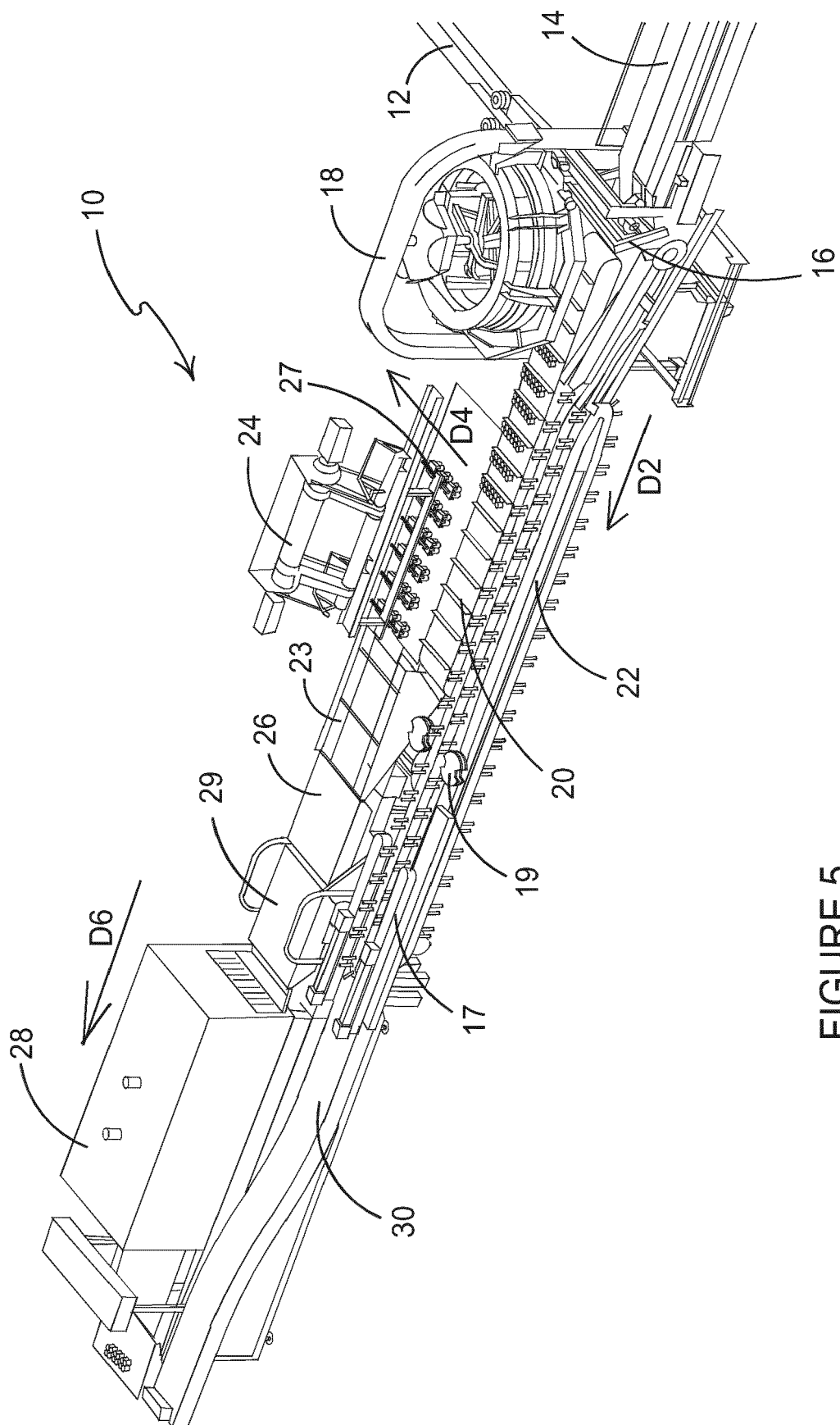


FIGURE 5

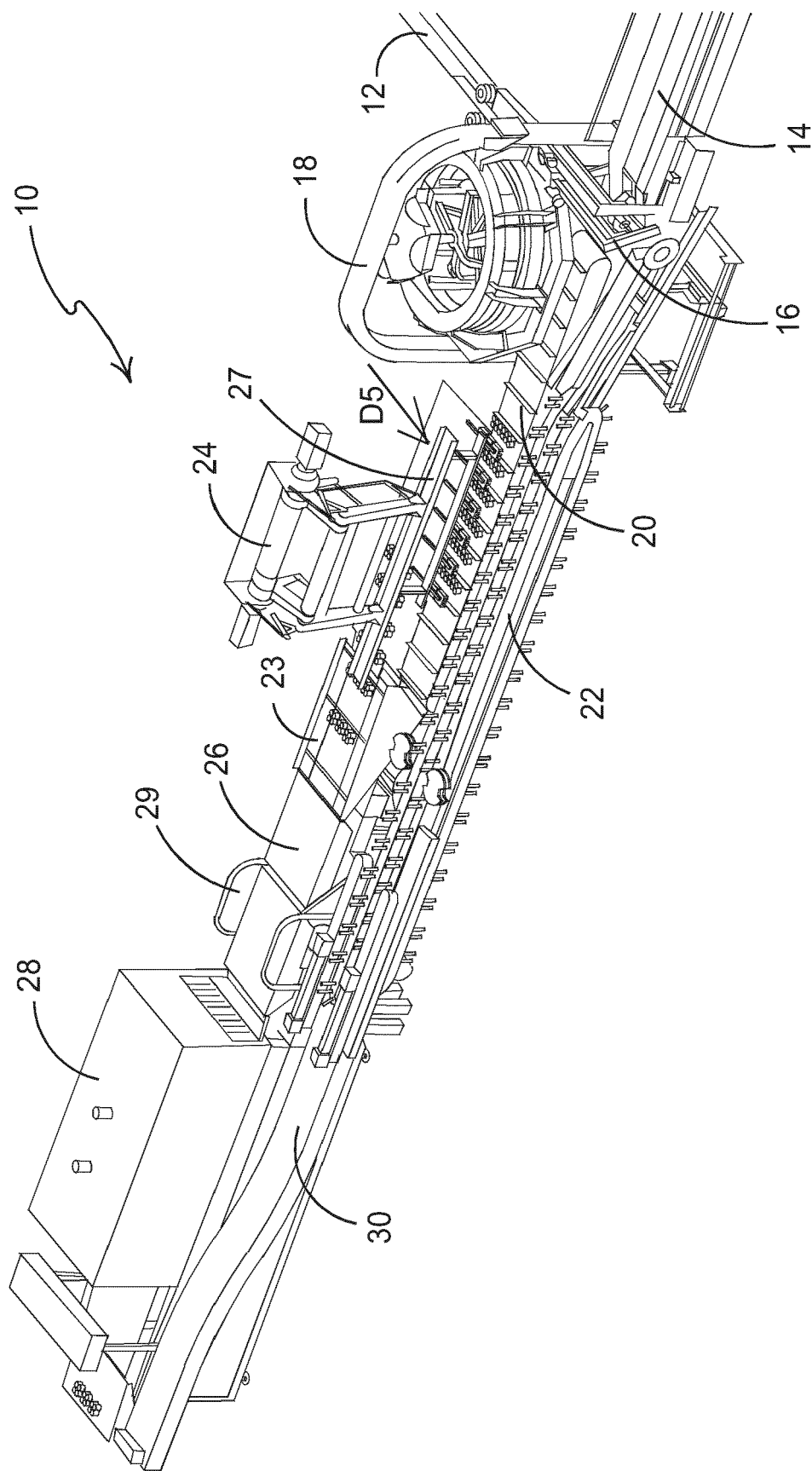


FIGURE 6

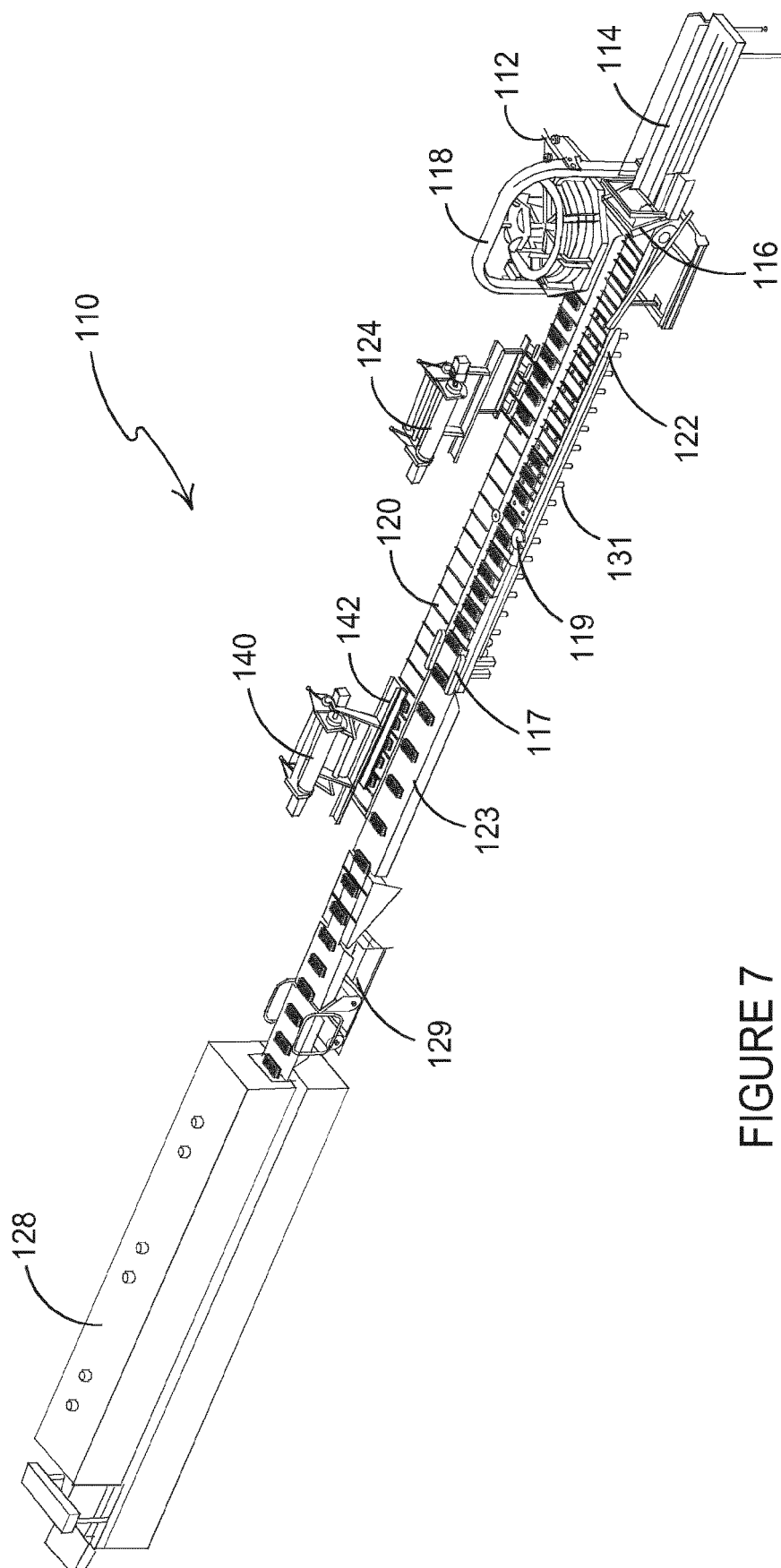


FIGURE 7

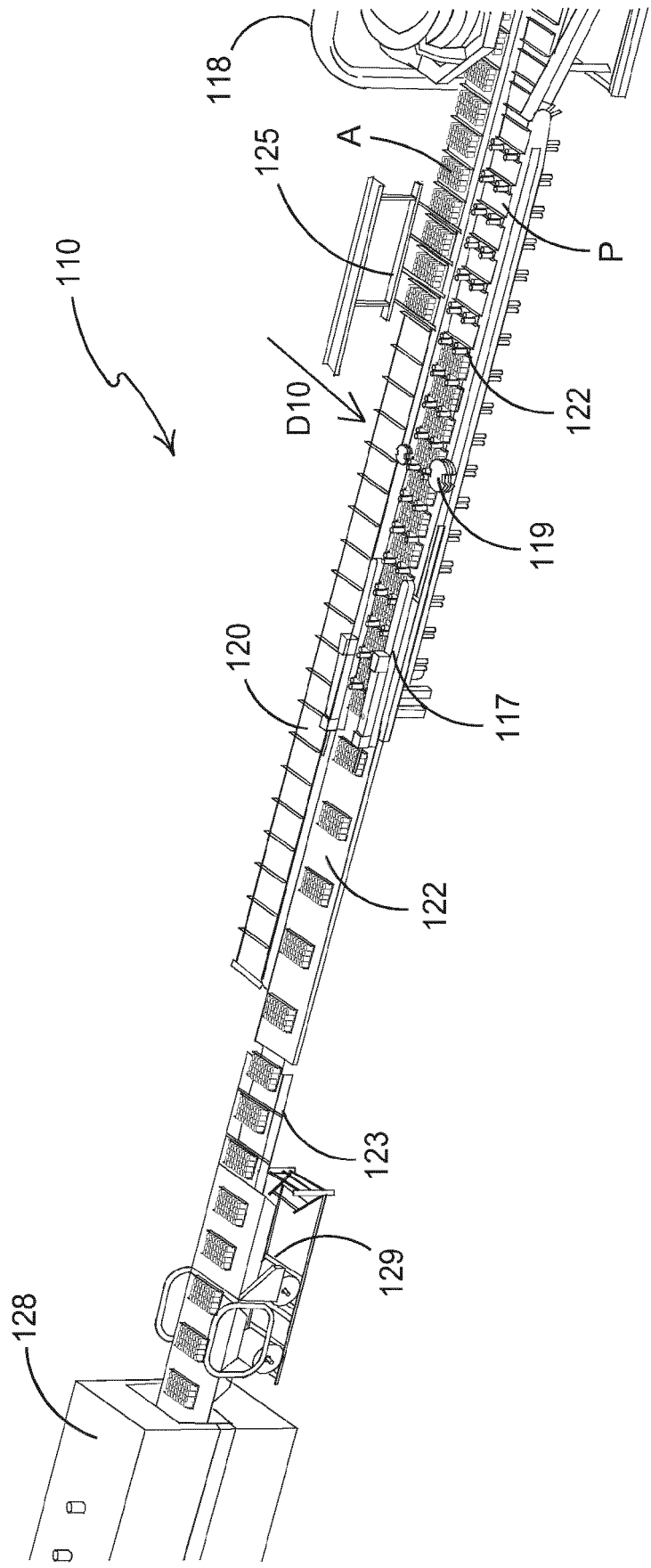


FIGURE 8

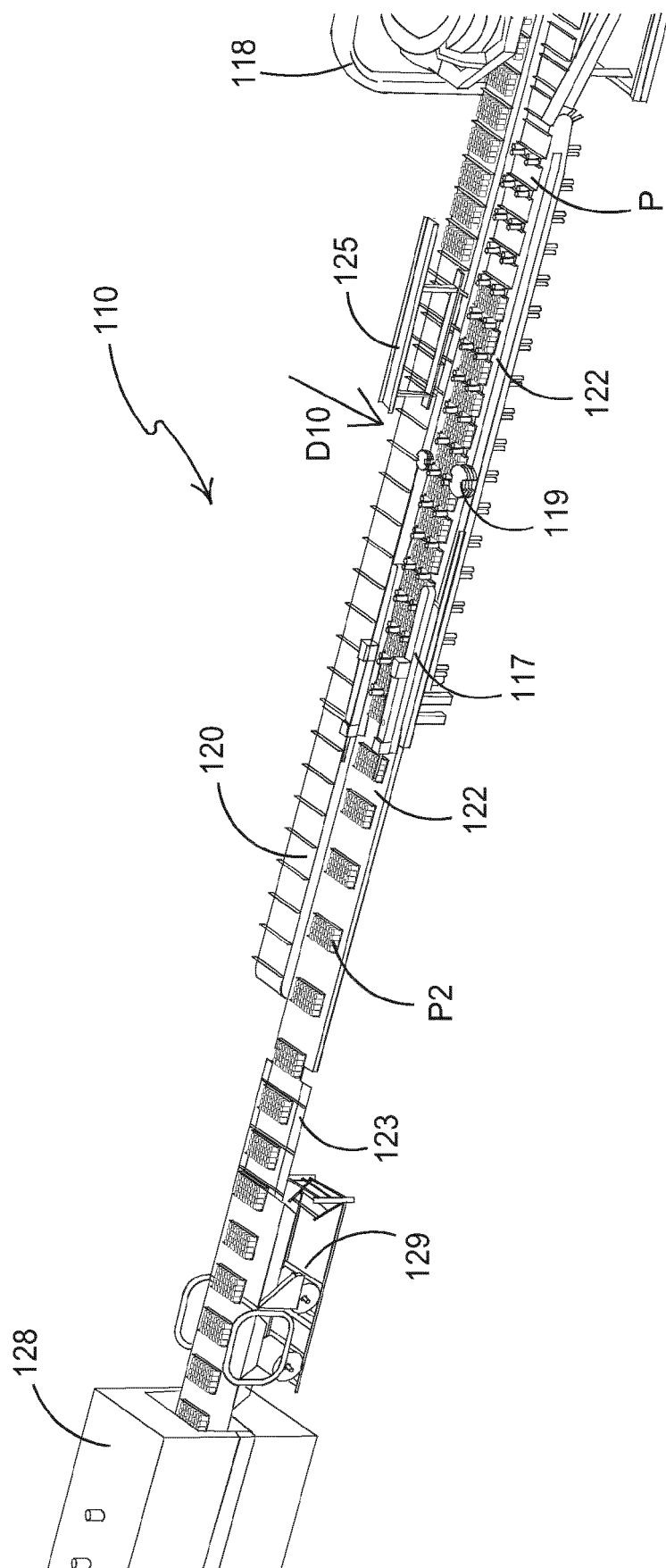


FIGURE 9

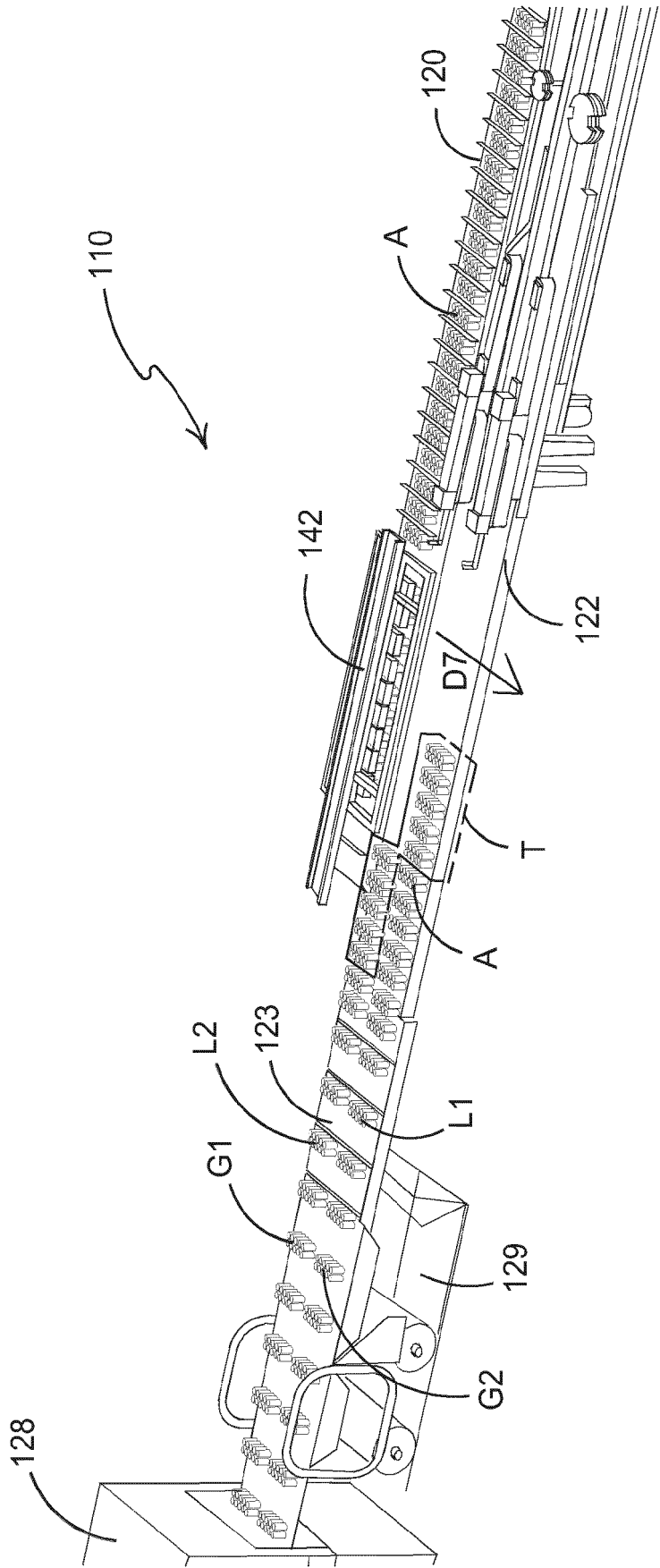


FIGURE 10

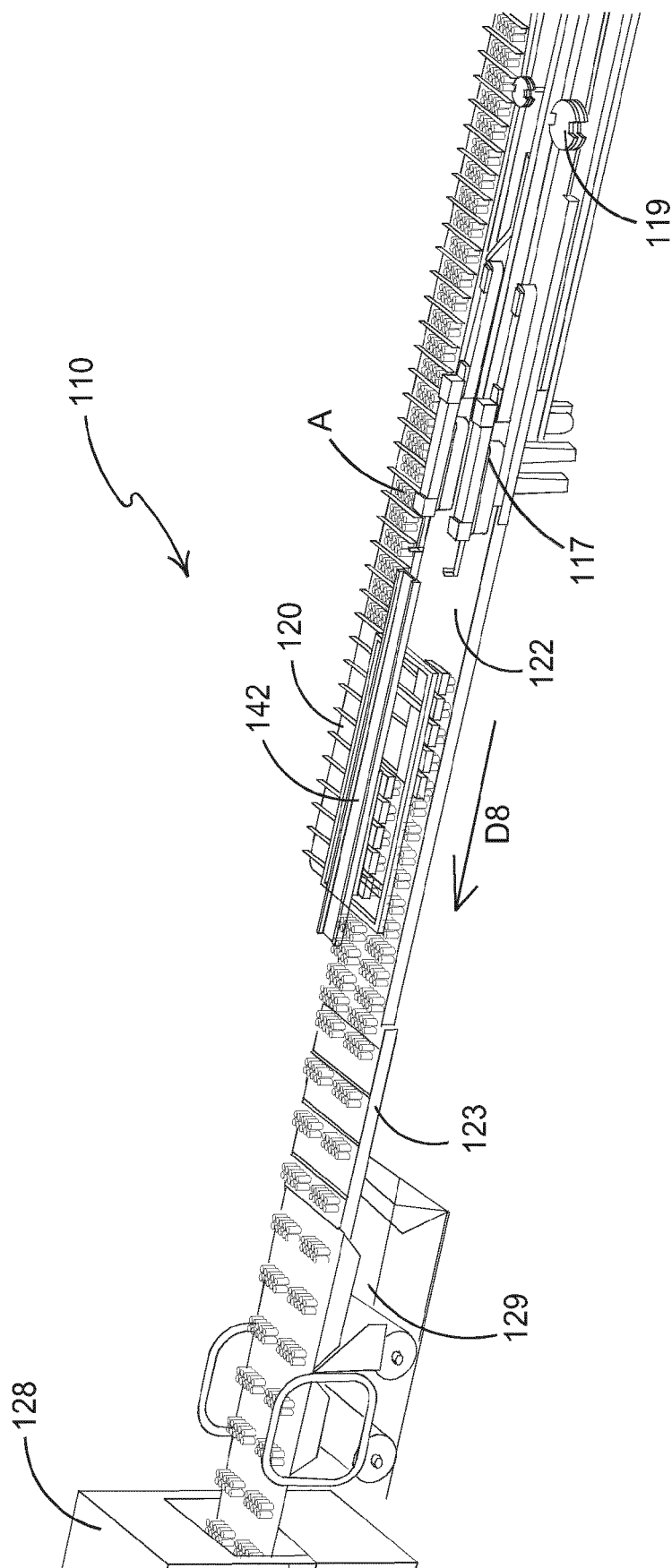


FIGURE 11

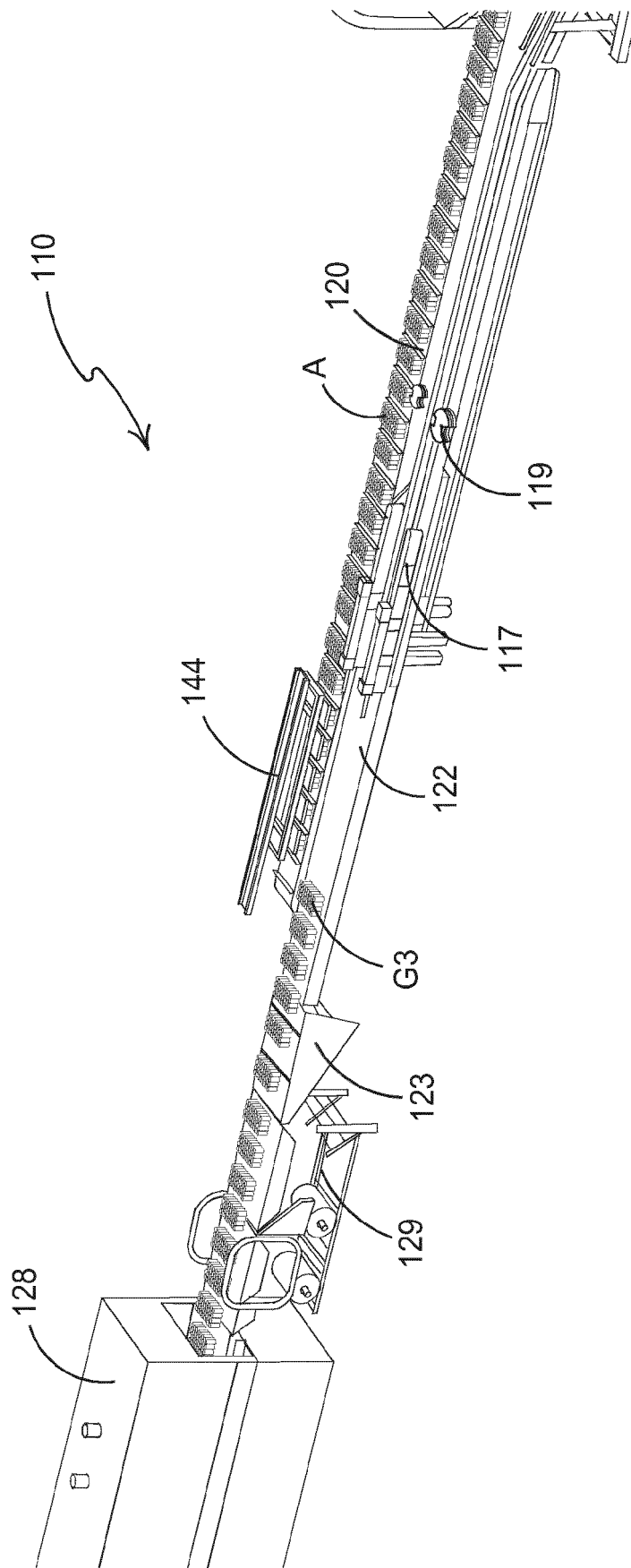


FIGURE 12

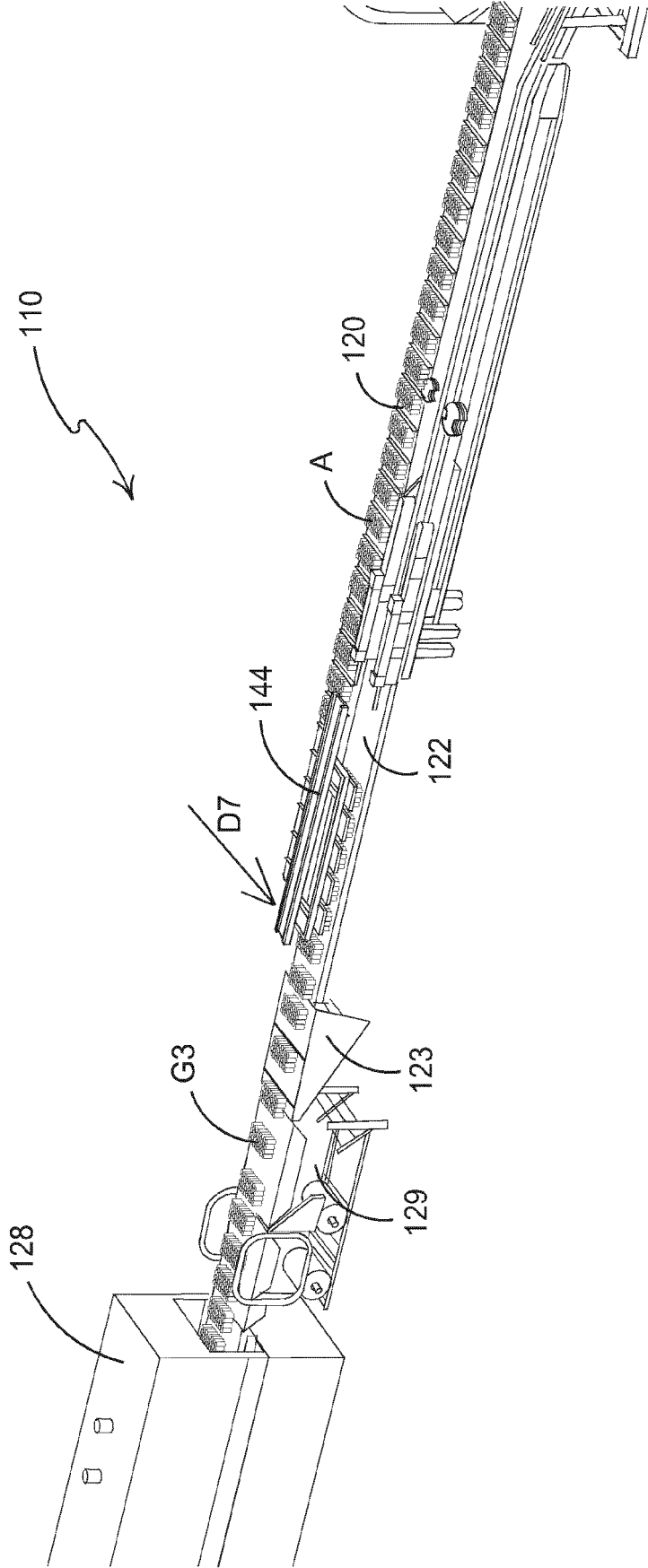


FIGURE 13

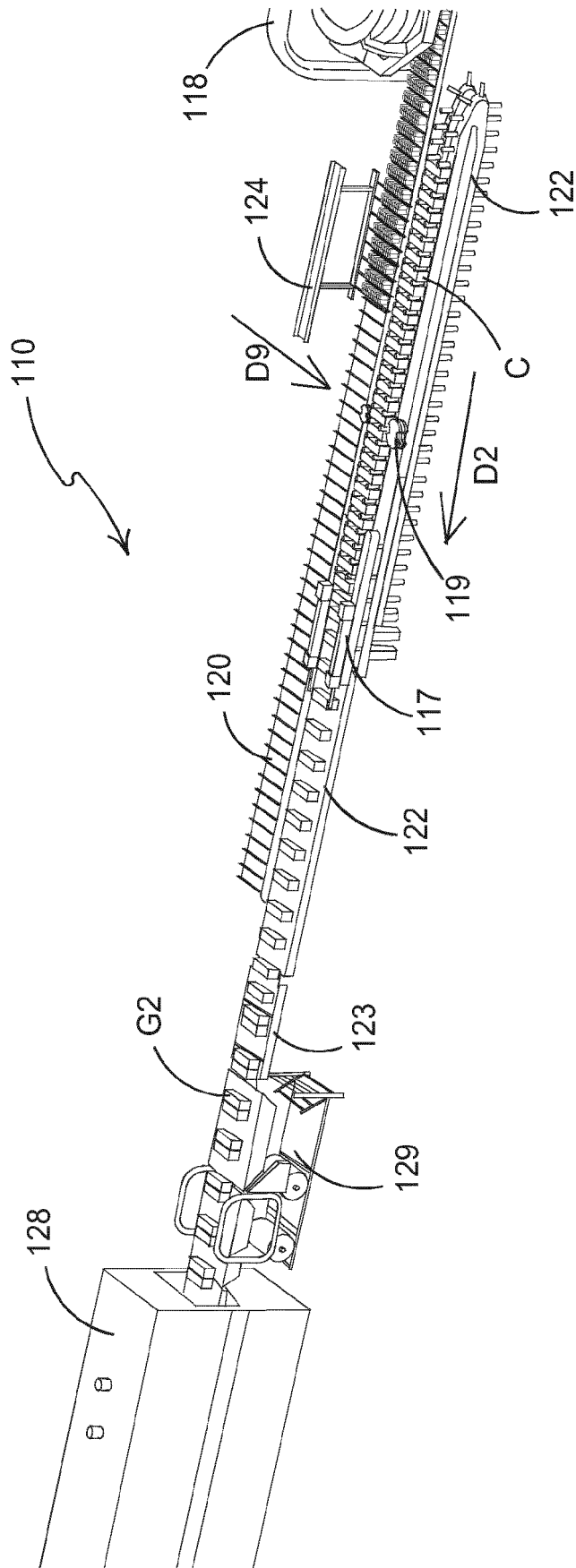


FIGURE 14

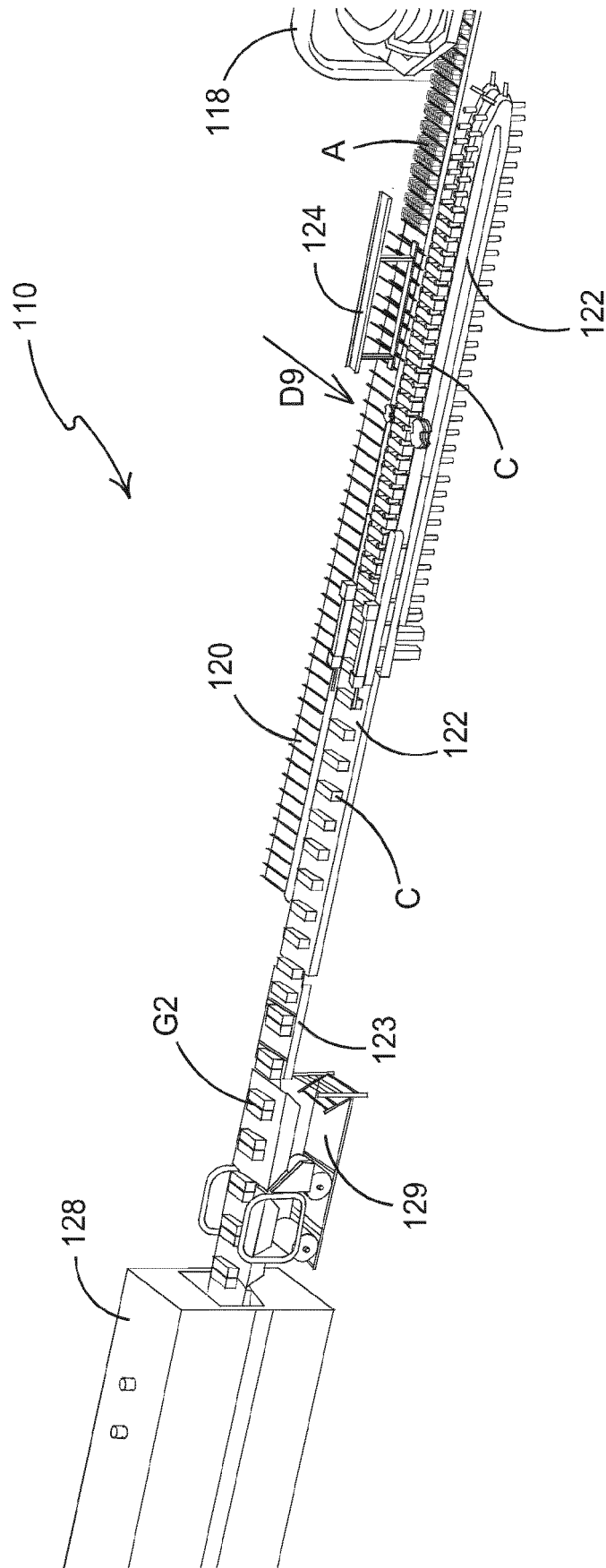


FIGURE 15



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