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(71) Applicant: **AVERY DENNISON CORPORATION** [US/US]; 207 Goode Avenue, Glendale, CA 91203 (US).

(72) Inventor: **COOPER, William J.**; 8 Heatherwood Drive, Shrewsbury, Massachusetts 01545 (US).

(74) Agent: **BEMBENICK, Brian G.** et al.; Avery Dennison Corporation, 8080 Norton Parkway, 22D, Mentor, OH 44060 (US).

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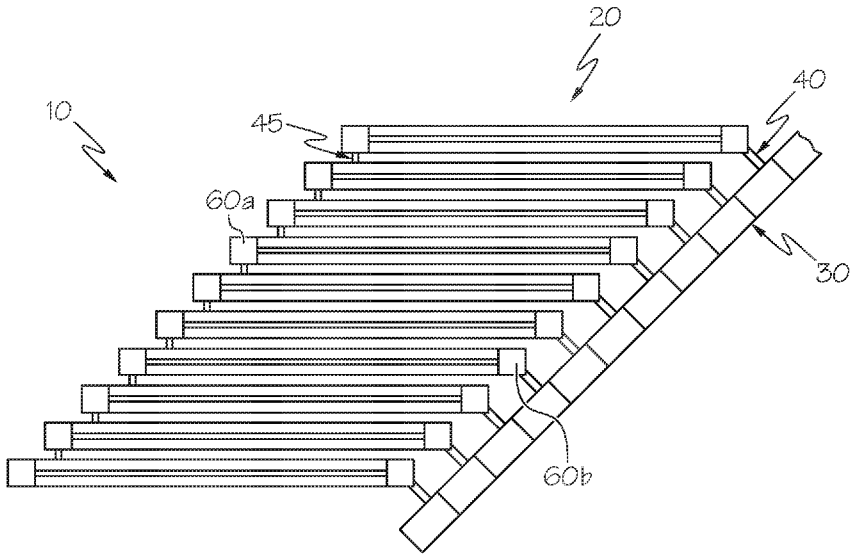


FIG. 1

(57) Abstract: A fastener stock comprising: 1) at least one fastener device; 2) a runner bar; and 3) at least one connector, wherein the connector is disposed between the fastener device and the runner bar and wherein the fastener device comprises: a) a filament component; and b) a pair of longitudinal side members extending in a parallel spaced relationship. A fastener applicator for attaching at least one object to packaging is also disclosed comprising: 1) an applicator; 2) a feed clip; and 3) at least one knife for separating an individual fastener device from a fastener stock. Further, a method for attaching at least one object to packaging is disclosed comprising: 1) positioning a fastener applicator containing a fastener stock to packaging to secure at least one object; and 2) penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

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FASTENER CLIP

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefit of U.S. Provisional Patent Application No. 62/642,854 filed March 14, 2018, which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] Fastening devices are commonly used in a wide variety of industries to attach tags, labels, or other identifiers to many different products. Fastening devices are also used to attach products to packaging for both display purposes and security measures. Fastening devices are widely used to secure a variety of products to packaging material, such as, but not limited to, cardboard or plastic backing.

[0003] Fastening devices are often attached of affixed to packaging through the use of an apparatus. The apparatus may include a fastener clip that includes a runner bar which holds fasteners in series such that multiple fastening devices may be attached without reloading the apparatus. To increase the speed and efficiency of the apparatus, a pneumatically powered fastener-driving tool may also be used with the apparatus.

[0004] The present disclosure relates generally to a fastener device. More particularly, the present disclosure relates to a fastener device for securely attaching at least one product to packaging or another product. Additionally, the present disclosure also provides the apparatus for attaching the fastener device disclosed herein.

SUMMARY

[0005] The following presents a simplified summary in order to provide a basic understanding of some embodiments described in the detailed description. This summary is not an extensive overview, and it is not intended to identify key/critical elements or to delineate the scope thereof. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

[0006] The subject matter disclosed and claimed herein, in one aspect thereof, comprises a fastener stock for securely attaching at least one object to packaging. A fastener stock may comprise: 1)

at least one fastener device; 2) a runner bar; and 3) at least one connector. In many embodiments, the connector may be disposed between the fastener device and the runner bar. In many embodiments, the fastener device may comprise: a) a filament component; and b) a pair of longitudinal side members extending in a parallel spaced relationship.

[0007] In some embodiments, the fastener device further comprises at least one anti-rotation gripper affixed to one of the longitudinal side members. In some embodiments, the pair of longitudinal side members are the same length. In other embodiments, the pair of longitudinal side members are different lengths. In some embodiments, one of the pair of longitudinal side members is paddle-shaped. In some embodiments, the width for the pair of longitudinal side members of the fastener devices is substantially parallel to the length of the runner bar. In other embodiments, the width for the pair of longitudinal side members of the fastener devices is substantially perpendicular to the length of the runner bar. In many embodiments, the runner bar is angled in relation to the fastener device. In some embodiments, the runner bar further comprises at least one notch. In many embodiments, the connector is molded to the runner bar substantially perpendicular. In some embodiments, the connector is molded to the runner bar at an angle of about 90 degrees. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector 40. In some embodiments, a stabilizer may connect at least two fastener devices. In many embodiments, the stabilizer is molded to the fastener device substantially perpendicular. In some embodiments, the stabilizer is molded to the fastener device at an angle of about 90 degrees.

[0008] In many embodiments, the length of the fastener device is between about 5 mm and about 50 mm. In some embodiments, the length of the fastener device may be between about 6 mm and about 30 mm. In many embodiments, the fastener device is comprised of plastic. In some embodiments, the fastener device is comprised of at least one material of polypropylene, nylon, PET, polyurethane, recyclable plastics, bio-based plastics, biodegradable plastics, PHA, PHB, and PVA materials.

[0009] In yet other embodiments, the fastener device may be used in non-packaging applications. In one embodiment, the fastener device may be used for applying a hanging tag. In one embodiment, the fastener device may be used in connecting two or more products together.

[0010] Also disclosed herein is a fastener applicator for attaching at least one object to packaging comprising the fastener stock described herein. Additionally, the fastener applicator for attaching at least one object to packaging comprising: 1) an applicator; 2) a feed clip; and 3) at least one knife for separating an individual fastener device from a fastener stock.

[0011] In many embodiments, the fastener application may further comprise a handle. In some embodiments, the fastener applicator may further comprise a pneumatic operation attachment point. A pneumatic device may be connected at the pneumatic operation attachment point. A pneumatic device

may be used to increase the speed of deployment of the fastener applicator. In some embodiments, the pneumatic device may be used to increase the accuracy in deploying the fastener device to secure at least one object and packaging. In some embodiments, the pneumatic device may be manually operated. In other embodiments, the pneumatic device may be electrically operated.

[0012] In some embodiments, the fastener applicator may further comprise a feed mechanism for advancing the fastener device.

[0013] Also described herein is a method for attaching at least one object to packaging using the fastener stock disclosed herein. Further, a method for attaching at least one object to packaging may comprise: 1) positioning a fastener applicator containing a fastener stock described herein to packaging to secure at least one object; and 2) penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

[0014] The method may further comprise using a pneumatic operation attachment point while penetrating the packaging with the fastener applicator and ejecting at least part of the fastener device through the pneumatic operation attachment point. The use of a pneumatic device, including the pneumatic operation attachment point, may increase the speed of deployment of the fastener applicator. In some embodiments, the pneumatic device and pneumatic operation attachment point may be used to increase the accuracy in deploying the fastener device to secure at least one object and packaging.

[0015] In another embodiment, a method for attaching at least one object to packaging may comprise: 1) positioning a fastener applicator containing a fastener stock to packaging to secure at least one object, wherein the fastener stock comprises: a) at least one fastener device; b) a runner bar; and c) at least one connector; wherein the connector is disposed between the fastener device and the runner bar; and wherein the fastener device comprises: a) a filament component; and b) a pair of longitudinal side members extending in a parallel spaced relationship; and 2) penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

[0016] In many embodiments, the fastener applicator may contain a contiguous chain of fastener devices is at least 25 fastener devices. In some embodiments, the fastener applicator may contain a contiguous chain of fastener devices is at least 50 fastener devices.

[0017] To the accomplishment of the foregoing and related ends, certain illustrative aspects of the disclosed innovation are described herein in connection with the following description and the annexed drawings. These aspects are indicative, however, of but a few of the various ways in which the principles disclosed herein can be employed and is intended to include all such aspects and their

equivalents. Other advantages and novel features will become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] These and other features, aspects and advantages are better understood when the following detailed description is read with reference to the accompanying drawings, in which:

[0019] **FIG. 1** illustrates a view of a fastener stock in accordance with the disclosed architecture.

[0020] **FIG. 2** illustrates a view of a fastener stock in accordance with the disclosed architecture.

[0021] **FIG. 3** illustrates a view of a fastener stock in accordance with the disclosed architecture.

[0022] **FIG. 4** illustrates the fastener device for attaching an object to packaging in accordance with the disclosed architecture.

[0023] **FIG. 5** illustrates a view of a fastener stock in accordance with the disclosed architecture.

[0024] **FIG. 6** illustrates a view of the fastener stock in accordance with the disclosed architecture.

[0025] **FIG. 7** illustrates a view of the fastener stock in accordance with the disclosed architecture.

[0026] **FIG. 8** illustrates a view of the fastener stock in accordance with the disclosed architecture.

[0027] **FIG. 9** illustrates a view of the fastener applicator in accordance with the disclosed architecture.

[0028] **FIG. 10** illustrates a view of the fastener applicator in accordance with the disclosed architecture.

[0029] **FIG. 11** illustrates a method for dispensing individual fasteners to be used in packaging at least one object in accordance with the disclosed architecture.

[0030] **FIG. 12** illustrates a method for dispensing individual fasteners to be used in packaging at least one object in accordance with the disclosed architecture.

[0031] **FIG. 13** illustrates a method for dispensing individual fasteners to be used in packaging at least one object in accordance with the disclosed architecture.

[0032] **FIG. 14** illustrates a method for dispensing individual fasteners to be used in packaging at least one object in accordance with the disclosed architecture.

[0033] **FIG. 15** illustrates a view of the fastener applicator in accordance with the disclosed architecture.

DETAILED DESCRIPTION

[0034] Embodiments will now be described more fully hereinafter with reference to the accompanying drawings in which example embodiments are shown. Whenever possible, the same reference numerals are used throughout the drawings to refer to the same or like parts. However, this disclosure may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.

[0035] Referring initially to the drawings, FIGS. 1-15 illustrate example embodiments described herein.

[0036] Disclosed herein is a fastener device for securely attaching at least one object to packaging. In other applications, the fastener device disclosed may hold or secure at least two different objects together with the packaging. In some embodiments, more than one object may be attached to each other with the fastener device described herein. The object may be any type of product to be sold or displayed with the packaging.

[0037] The fastener device described herein can also be used to attach objects to other rigid and non-rigid structures as well as the packaging described herein. The fastener device may attach at least one object to packaging or other materials such as, but not limited to, paper, cardboard, plastic, metal, a sheet of wood, or other material sufficient to secure the object. In some embodiments, the fastener device may be inserted through pre-punched holes that are placed in the packaging to orientate the object. In other embodiments, the fastener applicator may create holes through which the fastener device is deployed. In some embodiments, the object may be mounted to at least a portion of packaging to house the object. In many embodiments, the object may be mounted on or within the packaging at a predetermined orientation that allows examination of the object by a potential purchaser without removal of the object from the packaging when making a purchasing decision. Mounting the object within the packaging can also avoid impact damage to the object that may otherwise occur during transport of the object to a shipment destination. The packaging and object(s) used with the fastener device may be of various shapes and sizes.

[0038] The fastener device described may accommodate the packaging and objects due to the flexibility of the fastener device. Once installed, the fastener device described herein may create a certain fit between at least one object and the packaging. In many embodiments, at least one object may be positioned within the filament component. In some instances, the fit between at least one object and packaging may be a snug fit such that at least one may not be able to move or move very little. In other

instances, the fit between at least one and packaging may be a looser fit such that the object(s) may be manipulated without being removed from its attachment from the fastener device. Additionally, the fastener device described herein is strong enough to withstand harsh environments and mechanical stresses such as friction.

[0039] **FIG. 1** illustrates a view of a fastener stock 10 in accordance with the disclosed architecture. The fastener stock 10, as shown in FIG.1, may comprise: 1) at least one fastener device 20; 2) a runner bar 30; and 3) at least one connector 40. Optionally, as shown in FIG. 1, at least one stabilizer 45 may also aid in connecting the fastener devices 20.

[0040] In many embodiments, a plurality of fastener devices 20 may be linkable together in a contiguous chain as fastener stock 10 through the connection(s) to the runner bar by at least one connector. The fastener stock 10 may be singulated with the use of the fastener applicator 100 as each individual fastener device is deployed. In many embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 5 fastener devices. In many embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 25 fastener devices. In some embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 30 fastener devices. In some embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 50 fastener devices. In some embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 100 fastener devices. In some embodiments, the fastener stock 10 may contain a contiguous chain of fastener devices 20 of at least 200 fastener devices.

[0041] **FIGS. 2 and 3** illustrate a view of a fastener stock in accordance with the disclosed architecture. The fastener stock 10, as shown in detail in **FIG. 4**, may comprise: 1) at least one fastener device 20; 2) a runner bar 30; and 3) at least one connector 40. In some embodiments, the runner bar 30 further comprises at least one notch 80 (shown in **FIG. 3**). The notch may be used in feeding the fastener stock by the fastener applicator 100. In some embodiments, an optional notch 80 in the runner bar 30 may assist in moving the fastener stock 10 through the fastener applicator 100 such that another fastener device 20 may be ready to deploy and secure at least one object and packaging.

[0042] In many embodiments, the connector 40 may be disposed between the fastener device 20 and the runner bar 30. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector 40. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 35 degrees to about 50 degrees relative to the length of the connector 40. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 40 degrees to about 50 degrees. In some embodiments, the connector 40 is molded to the runner bar 30 at an angle of about 45 degrees. The angled orientation of the fastener stock may create more clearance of the fastener applicator 100 and fastener stock 10 to move within tight areas of the packaging.

In some embodiments, the connector 40 is roughly or substantially rounded or oval in shape with no distinct edges. In other embodiments, the connector 40 is roughly or substantially square or rectangular with distinct edges. In many embodiments, the connector 40 is sized such that a clean or distinct cut may be made in the connector when the fastener device 20 is deployed from the fastener applicator 100. In many embodiments, the circumference (or thickness) of the connector 40 is smaller than the circumference (or thickness) of the filament of the fastener device.

[0043] In some embodiments, a stabilizer 45 may connect at least two fastener devices 20. The fastener devices 20 may be connected by the stabilizer 45 at various parts of the fastener devices 20. In one embodiment, the stabilizer 45 may connect the two filament components 50 from two different fastener devices 20. In another embodiment, the stabilizer 45 may connect a filament component 50 of one fastener device 20 to one of the longitudinal side members (60a or 60b) of a different fastener device. In yet another embodiment, the stabilizer may connect one of the longitudinal side members (60a or 60b) of one fastener device 20 to one of the longitudinal side members (60a or 60b) of a different fastener device 20. Although the fastener devices 20 may be connected to one another through the connector 40 and runner bar 30, the stabilizer 45 may provide another means for keeping the fastener stock 10 together. The stabilizer 45 may be such a thickness where at least two fastener devices 20 can be easily separated by cutting or twisting. In some embodiments, the stabilizer 45 is cut or twisted within the fastener applicator 100. In other embodiments, the stabilizer 45 is cut or twisted after the fastener device 20 is deployed from the fastener applicator 100. The stabilizer 45 may be cut by some type of cutting device. Alternatively, the stabilizer 45 may be twisted, either manually or by some type of machine, in order to separate at least two fastener devices 20 from each other.

[0044] In many embodiments, the length of the fastener device 20 may be between about 5 mm and about 50 mm. In some embodiments, the length of the fastener device 20 may be between about 6 mm and about 30 mm. In many embodiments, the fastener device 20 is comprised of plastic. In some embodiments, the fastener device 20, runner bar 30, and/or connector 40 may be comprised of at least one material of polypropylene, nylon, PET, polyurethane, recyclable plastics, bio-based plastics, biodegradable plastics, PHA, PHB, and PVA materials. The fastener device 20 may be manufactured for heavy duty fastening operations such as attaching at least one object to packaging.

[0045] **FIG. 4** illustrates the fastener device 20 for attaching an object to packaging in accordance with the disclosed architecture. The fastener device 20 may comprise: a) a filament component 50 (shown with sides 55a and 55b); and b) a pair of longitudinal side members 60a and 60b extending in a parallel spaced relationship.

[0046] The filament component 50 may be of different lengths and thicknesses, which may depend on the application for the fastener device 20. In some embodiments, the filament component 50

may be cylindrical. In other components, the filament component 50 may have edges along the length of the filament component 50. The filament component 50 may be at least partially affixed to a pair of longitudinal side members 60a and 60b. In one embodiment, at least one of the pair of longitudinal side members (60a and/or 60b) may be a paddle or paddle-shaped. In other embodiments, the pair of longitudinal side members 60a and 60b are different lengths. In some embodiments, the pair of longitudinal side members 60a and 60b may be the same length. In some embodiments, the pair of longitudinal side members 60a and 60b may appear to be identical to each other. In many embodiments, at least one of the longitudinal side members (60a and/or 60b) may be used to secure the fastener device to the packaging. In many embodiments, at least one longitudinal side member (60a and/or 60b) may be manipulated by the user or customer to release the fastener device 20 from at least one object by twisting or cutting in order to remove at least one object from the packaging. In some embodiments, the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 is substantially parallel to the length of the runner bar 30. In other embodiments, the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 is substantially perpendicular to the length of the runner bar 30.

[0047] Optionally, as shown in **FIG. 4**, the fastener device may comprise an anti-rotation gripper 70 (may also be referred to as a rib) affixed to at least one of the longitudinal side members. The anti-rotation gripper may prevent the fastener device from moving while it is being applied through the use of the fastener applicator. The anti-rotation gripper may also serve to hold the fastener in place during any shipping or handling.

[0048] **FIGS. 5-8** illustrate various views of a fastener stock 10 in accordance with the disclosed architecture. The fastener stock 10, as shown in **FIGS. 5-8**, may comprise: 1) at least one fastener device 20; 2) a runner bar 30; and 3) at least one connector 40 where the fastener device 20 may comprise: a) a filament component 50; and b) a pair of longitudinal side members 60a and 60b extending in a parallel spaced relationship.

[0049] In many embodiments, the runner bar 30 may engage with a feature in the fastener applicator 100 (see **FIGS. 5-8**) to hold the fastener stock 10 in place when loaded. In many embodiments, the runner bar 30 is about the length of the fastener stock 10. In some embodiments, the runner bar 30 extends further than the length of the fastener stock 10. The runner bar 30 may be roughly or substantially straight. However, in some embodiments, the runner bar 30 may be curved. In some embodiments, the runner bar 30 is roughly or substantially rounded or oval in shape with no distinct edges. In other embodiments, the runner bar 30 is roughly or substantially square or rectangular with distinct edges. In many embodiments, the runner bar 30 is angled in relation to the fastener device 20 due to the angled molding of the connector 40 and the fastener device 20 since the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector 40. In many embodiments, the

connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 35 degrees to about 50 degrees. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 40 degrees to about 50 degrees. In some embodiments, the connector 40 is molded to the runner bar 30 at an angle of about 45 degrees.

[0050] In **FIG. 5** and certain embodiments, one of the pair of longitudinal side members 60a is in the shape of a paddle. In some embodiments and as shown in **FIG. 5**, the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 (defined herein as the greatest distance between the edges of each of the pair of longitudinal side members 60a and 60b) may be substantially perpendicular to the length of the runner bar 30. In some embodiments and as shown in **FIG. 5**, the length of the filament component 50 (described herein as the length of the filament between both pairs of longitudinal side members 60a and 60b) may be substantially perpendicular to the length of the runner bar 30. However, in other embodiments (not shown), the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 are substantially parallel to the length of the runner bar 30.

[0051] In yet other embodiments, as shown in **FIG. 6**, the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 are neither substantially parallel nor substantially perpendicular to the length of the runner bar 30. Rather, **FIG. 6** illustrates an arrangement of at least one fastener device 20 in which the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 are angled with respect to the length of the runner bar 30 due to the angled orientation of the connector 40. In some embodiments, this angle may be about 35 degrees to about 50 degrees. In some embodiments, this angle may be about 40 degrees to about 50 degrees. In some embodiments, this angle may be about 45 degrees. In some embodiments and as shown in **FIG. 6**, the length of the filament component 50 may be substantially perpendicular to the length of the runner bar 30.

[0052] **FIG. 7** illustrates an arrangement of at least one fastener device 20 in which the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 may be substantially perpendicular to the length of the runner bar 30. In some embodiments and as shown in **FIG. 7**, the length of the filament component 50 may be substantially perpendicular to the length of the runner bar 30.

[0053] **FIG. 8** illustrates an arrangement of at least one fastener device 20 in which the width for the pair of longitudinal side members 60a and 60b of the fastener devices 20 may be substantially perpendicular to the length of the runner bar 30. However, in this embodiment, the length of the filament component 50 is not substantially perpendicular to the length of the runner bar 30 but rather at a specified angle for its configuration due to the angled orientation between the fastener device 20 and the connector 40. In some embodiments, this angle between the length of the filament component 50 and the length of

the runner bar 30 may be about 35 degrees to about 50 degrees. In some embodiments, this angle may be about 40 degrees to about 50 degrees. In some embodiments, this angle may be about 45 degrees.

[0054] **FIGS. 9 and 10** illustrate a view of the fastener applicator 100 in accordance with the disclosed architecture. The fastener applicator 100 may comprise 1) an applicator 130; 2) a feed clip 140 (not shown in **FIG. 9 or 10**); and 3) at least one knife 150 (not shown in **FIG. 9 or 10**). The fastener stock 10 is shown in relation to the fastener applicator 100. In this figure, the fastener stock 10 has been loaded into the fastener applicator 100 in preparation of deployment of the fastener device 20 from the fastener applicator 100.

[0055] The fastener applicator 100 may serve to apply the fastener device 20 described herein. In many embodiments, the fastener applicator 100 may serve to apply the fastener device 20 to the packaging and provide the means to secure at least one object to packaging when the fastener device 20 is deployed from the fastener applicator 100. In many embodiments, the fastener device 20 may be inserted through pre-punched holes that are placed in the packaging to orientate the object with an applicator tip 130. In one embodiment, the applicator tip 130 may comprise a hollow needle.

[0056] In many embodiments, a feed clip 140 on the fastener applicator 100 may hold a fastener stock 10 of fastener devices 20. In many embodiments, the feed clip 140 may hold at least one fastener device 20. In one embodiment, the feed clip 140 may hold only one fastener device 20.

[0057] Additionally, the fastener applicator 100 may further comprise a handle 120 for a user to grip the fastener applicator 100. The handle 120 may also assist the user in manipulating the fastener applicator 100 so that the fastening device 20 may be attached accurately to secure at least one object to packaging.

[0058] Also shown in **FIGS. 9 and 10** is the optional pneumatic operation attachment point 110. In some embodiments, the fastener applicator 100 may further comprise a pneumatic operation attachment point 110. A pneumatic device may be connected at the pneumatic operation attachment point 110. A pneumatic device may provide compressed air to the pneumatic operation attachment point 110. The use of a pneumatic device, including the pneumatic operation attachment point 110, may increase the speed of deployment of the fastener applicator 100. In some embodiments, the pneumatic device and pneumatic operation attachment point 110 may be used to increase the accuracy in deploying the fastener device 20 to secure at least one object and packaging. In some embodiments, the pneumatic device may be manually operated. In other embodiments, the pneumatic device may be electrically operated.

[0059] **FIGS. 11-15** illustrate the method for dispensing individual fasteners to be used in packaging at least one object in accordance with the disclosed architecture. In **FIGS. 11-15**, the internal portions of the fastener applicator 100 are shown. In **FIGS. 11-15**, the fastener applicator 100 with fastener stock 10 may contain individual fastener devices 20. Also shown in **FIGS. 11-15** is the runner

bar 30 of the fastener stock 10. In **FIGS. 11, 13, and 15**, the connector 40 of the fastener stock 10 is shown. In **FIGS. 11-15**, the fastener stock 10 has entered into the internal portions of the fastener applicator 100. Within the fastener applicator 100, the fastener stock 10 may be loaded in direction A, shown in **FIG. 11**, into the feed clip 140 where it is cut by at least one knife 150 at the connector 40. The fastener stock 10 is angled within the fastener applicator 100. In many embodiments, the fastener stock 10 is angled within the fastener applicator 100 at the angle prescribed by the connector 40. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 35 degrees to about 50 degrees. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 40 degrees to about 50 degrees. In some embodiments, the connector 40 is molded to the runner bar 30 at an angle of about 45 degrees. The angled orientation of the fastener clip may create more clearance of the fastener applicator 100 and fastener stock 10 to move within tight areas of the packaging.

[0060] **FIG. 12** also shows the fastener stock 10 may be loaded in direction A into the feed clip 140 where it is then cut by at least one knife 150 at the connector 40. The fastener stock 10 is angled within the fastener applicator 100 differently than what is shown in **FIG. 11**. In many embodiments and as shown in **FIG. 12**, the fastener stock 10 is angled within the fastener applicator 100 at the angle prescribed by the connector 40. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 35 degrees to about 50 degrees. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 40 degrees to about 50 degrees. In some embodiments, the connector 40 is molded to the runner bar 30 at an angle of about 45 degrees. The angled orientation of the feed clip 140 may create more clearance of the fastener applicator 100 and fastener stock 10 to move within tight areas of the packaging. In this particular embodiment in **FIG. 12**, the fastener devices 20 are oriented and loaded at about a 90-degree angle differently from what is shown in **FIG. 11**. For **FIG. 12**, the fastener devices are oriented for loading into the fastener applicator 100 substantially perpendicular relative to the length of the fastener device 20. In some embodiments, the width for the pair of longitudinal side members 60a and 60b (not shown) of the fastener device 20 is substantially perpendicular to the length of the runner bar 30.

[0061] **FIG. 13** shows the fastener device 20 being cut from the fastener stock 10 by at least one knife 150. In **FIG. 13**, the fastener applicator 100 with fastener stock 10 may contain individual fastener devices 20. Also shown is the runner bar 30 and connector 40 of the fastener stock 10. In **FIG. 13**, the fastener stock 10 has entered into the internal portions of the fastener applicator 100 where it is cut by at least one knife 150 at the connector 40. The fastener stock 10 is angled within the fastener

applicator 100. In many embodiments, the fastener stock 10 is angled within the fastener applicator 100 at the angle prescribed by the connector 40. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle relative to the length of the connector. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 35 degrees to about 50 degrees. In many embodiments, the connector 40 is molded to the fastener device 20 at an angle of about 40 degrees to about 50 degrees. In some embodiments, the connector 40 is molded to the runner bar 30 at an angle of about 45 degrees. In some embodiments, the cut by at least one knife 150 may be made at the point where the individual fastener device 20 meets the connector 40 and the individual fastener device 20 may now be in position to be deployed in order to secure at least one object to the packaging. Now, the individual fastener device 20, which has been fully separated from the fastener stock 10, is located in the feed clip 140 and waiting for deployment in direction B toward the applicator 130 (shown in FIG. 13) of the fastener applicator 100.

[0062] In many embodiments, the fastener applicator 100 may include at least one knife 150 for cutting to provide the individual fastener devices 20. In many embodiments, at least one knife 150 may be internally located in the fastener applicator 100. In some embodiments, at least one knife 150 may be externally located on the fastener applicator 100. In many embodiments, at least one knife 150 may separate the individual fastener devices 20 from the fastener stock 10. In some embodiments, at least one knife 150 may be used to cut the connector 40 disposed between the fastener device 20 and the runner bar 30, effectively separating the fastener device 20 and the runner bar 30. In one embodiment, the knife 150 used for cutting the connector may also be used to cut the stabilizer 45 connecting at least two fastener devices, effectively separating the fastener device. In another embodiment, at least one additional knife 150 may be used to cut the stabilizer 45 connecting at least two fastener devices, effectively separating the fastener device.

[0063] In **FIG. 13**, the fastener stock 10 has entered into the internal portions of the fastener applicator 100 where it is cut by at least one knife 150 at the connector 40 and the individual fastener device 20 has been fully separated from the fastener stock 10. Now, the individual fastener device 20 is located in the feed clip 140 and, having moved in direction B (as provided in **FIG. 13**) has been deployed toward the applicator 130 for attachment to secure at least one object and the packaging. In some embodiments, the cut by at least one knife 150 may be made at the point where the individual fastener device 20 meets the connector 40. In other embodiments, the connector 40 may be cut by at least one knife 150 such that a portion of the connector 40 is still at least partially attached to the individual fastener device 20. After the cut has been made to the connector 20, the individual fastener device 20 may now be in position to be deployed in order to secure at least one object to the packaging.

[0064] In **FIG. 14**, the fastener applicator 100 with fastener stock 10 may contain individual fastener devices 20. Also shown is the runner bar 30 of the fastener stock 10. After the cut has been made to the connector 40, the individual fastener device 20 may now be in position to be deployed in order to secure at least one object to the packaging. The individual fastener device 20 may now be moved in direction C to be deployed toward the applicator 130 to secure at least one object to the packaging.

[0065] In **FIG. 15**, the fastener applicator 100 with fastener stock 10 may contain individual fastener devices 20. Also shown is the runner bar 30 and connector 40 of the fastener stock 10. **FIG. 15** illustrates the fastener applicator 100 with fastener stock 10 prior to application of the individual fastener devices 20. **FIG. 15** also illustrates how the fastener applicator 100 with fastener stock 10 may be stored when not in use.

[0066] In some embodiments, the fastener applicator 100 may further comprise a feed mechanism (not shown) for advancing the fastener device(s). The feed mechanism may assist in moving the fastener stock 10 through the fastener applicator 100 such that another fastener device 20 may be ready to deploy and secure at least one object and packaging.

[0067] Also described is a method for attaching at least one object to packaging using the fastener stock described herein.

[0068] Further, a method for attaching at least one object to packaging may comprise: 1) positioning a fastener applicator described herein containing a fastener stock described herein to packaging to secure at least one object; and 2) penetrating the packaging with the fastener applicator described herein by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging applying the fastener device described herein to the packaging using the fastener applicator described herein. With the method described herein, at least one object may be at least partially secured to packaging. The method described herein may use the fastener applicator also described herein and the fastener stock described herein.

[0069] Additionally, a method for attaching at least one object to packaging may comprise: 1) positioning a fastener applicator containing a fastener stock to packaging to secure at least one object, wherein the fastener stock comprises: a) at least one fastener device; b) a runner bar; and c) at least one connector; wherein the connector is disposed between the fastener device and the runner bar; and wherein the fastener device comprises: a) a filament component; and b) a pair of longitudinal side members extending in a parallel spaced relationship; and 2) penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

[0070] In the method, a user may first position a fastener applicator containing a fastener stock to packaging to secure at least one object. Through the positioning, an accurate point of securement

may be established. Second, the user may penetrate the packaging using a fastener applicator. Third, the user may eject at least part of the fastener device through the fastener applicator so that the fastener applicator is at least partially secured to at least one object and the packaging. By penetrating the packaging, at least one object and the packaging may be connected through the fastener device after the fastener device is ejected.

[0071] What has been described above includes examples of the claimed subject matter. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the claimed subject matter, but one of ordinary skill in the art may recognize that many further combinations and permutations of the claimed subject matter are possible. Accordingly, the claimed subject matter is intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the term "includes" is used in either the detailed description or the claims, such term is intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim.

CLAIMS

What is claimed is:

1. A fastener stock for attaching at least one object to packaging comprising:
at least one fastener device;
a runner bar; and
at least one connector;
wherein the connector is disposed between the fastener device and the runner bar.

2. The fastener stock of claim 1, wherein the fastener device comprises:
a filament component; and
a pair of longitudinal side members extending in a parallel spaced relationship.

3. The fastener stock of claim 2, wherein the fastener device further comprises at least one anti-rotation gripper affixed to one of the longitudinal side members.

4. The fastener stock of any of claims 2 or 3, wherein the pair of longitudinal side members are the same length.

5. The fastener stock of any of claims 2 or 3, wherein the pair of longitudinal side members are different lengths.

6. The fastener stock of any of claims 2-5, wherein one of the pair of longitudinal side members is paddle-shaped.

7. The fastener stock of any of claims 1-6, wherein the runner bar is angled in relation to the fastener device.

8. The fastener stock of any of claims 1-7, wherein the runner bar further comprises at least one notch.

9. The fastener stock of any of claims 1-8, wherein the connector is molded to the fastener device at an angle.

10. The fastener stock of claim 9, wherein the connector is molded to the fastener device at an angle of about 35 degrees to about 50 degrees.

11. The fastener stock of any of claims 2-10, wherein the width for the pair of longitudinal side members of the fastener devices is substantially perpendicular to the length of the runner bar.

12. The fastener stock of any of claims 2-10, wherein the width for the pair of longitudinal side members of the fastener devices is substantially parallel to the length of the runner bar.

13. The fastener stock of any of claims 2-12, wherein the length of the filament component is substantially perpendicular to the length of the runner bar.

14. The fastener stock of any of claims 1-13, further comprising a stabilizer connecting at least two fastener devices.

15. The fastener stock of any of claims 1-14, wherein the length of the fastener device is between about 5 mm and about 50 mm.

16. The fastener device of any of claims 1-15, wherein the fastener device is comprised of plastic.

17. The fastener device of claim 16, wherein the fastener device is comprised of at least one material of polypropylene, nylon, PET, polyurethane, recyclable plastics, bio-based plastics, and biodegradable plastics, PHA, PHB, and PVA materials.

18. A method for attaching at least one object to packaging using the fastener stock of any of claims 1-17.

19. A fastener applicator for attaching at least one object to packaging comprising the fastener stock of any of claims 1-17.

20. A fastener applicator for attaching at least one object to packaging comprising:

an applicator;

a feed clip; and

at least one knife for separating an individual fastener device from a fastener stock.

21. The fastener applicator of claim 20 further comprising a handle.

22. The fastener applicator of any of claims 20 or 21 further comprising a pneumatic operation attachment point.

23. A fastener applicator of any of claims 20-22 further comprising a feed mechanism for advancing the fastener device.

24. A method for attaching at least one object to packaging comprising:

positioning a fastener applicator containing a fastener stock of any of claims 1-17 to packaging to secure at least one object; and

penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

25. A method for attaching at least one object to packaging comprising:

positioning a fastener applicator containing a fastener stock to packaging to secure at least one object, wherein the fastener stock comprises:

at least one fastener device;

a runner bar; and

at least one connector;

wherein the connector is disposed between the fastener device and the runner bar; and

wherein the fastener device comprises:

a filament component; and

a pair of longitudinal side members extending in a parallel spaced relationship; and

penetrating the packaging with the fastener applicator by ejecting at least part of the fastener device so that the fastener applicator is at least partially secured to at least one object and the packaging.

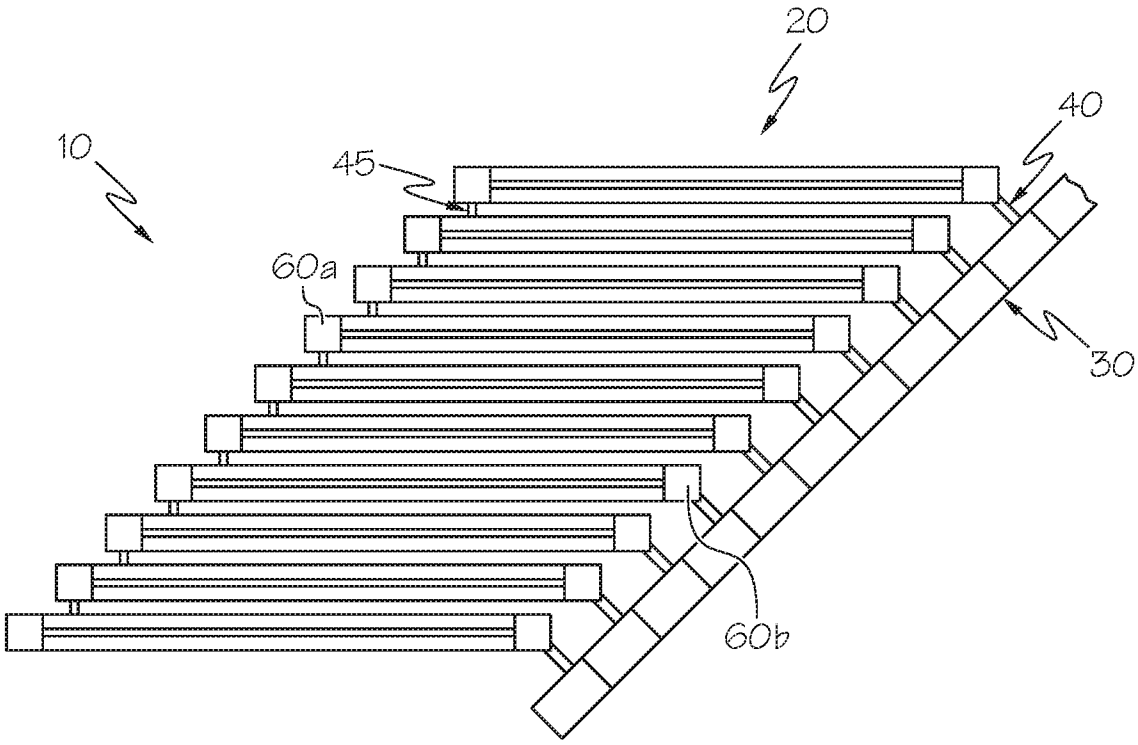


FIG. 1

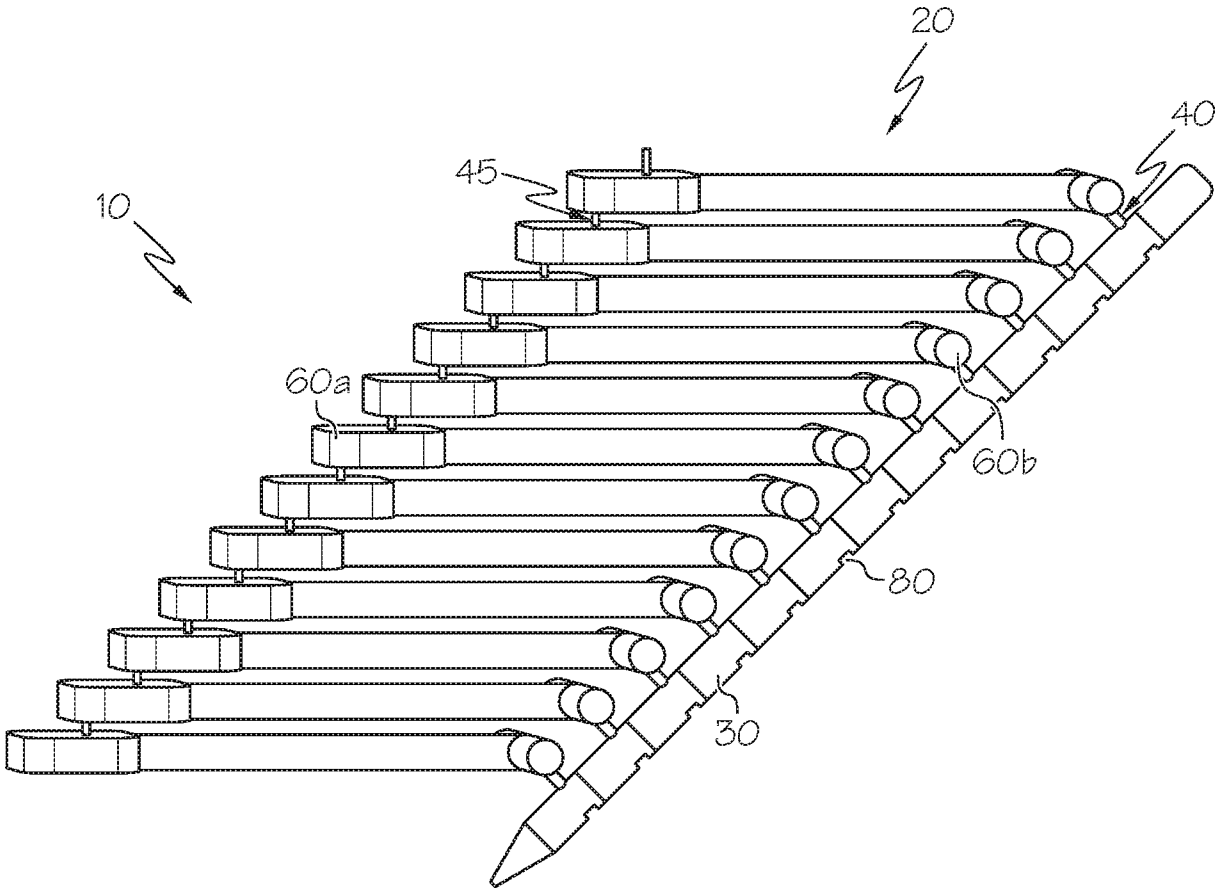


FIG. 2

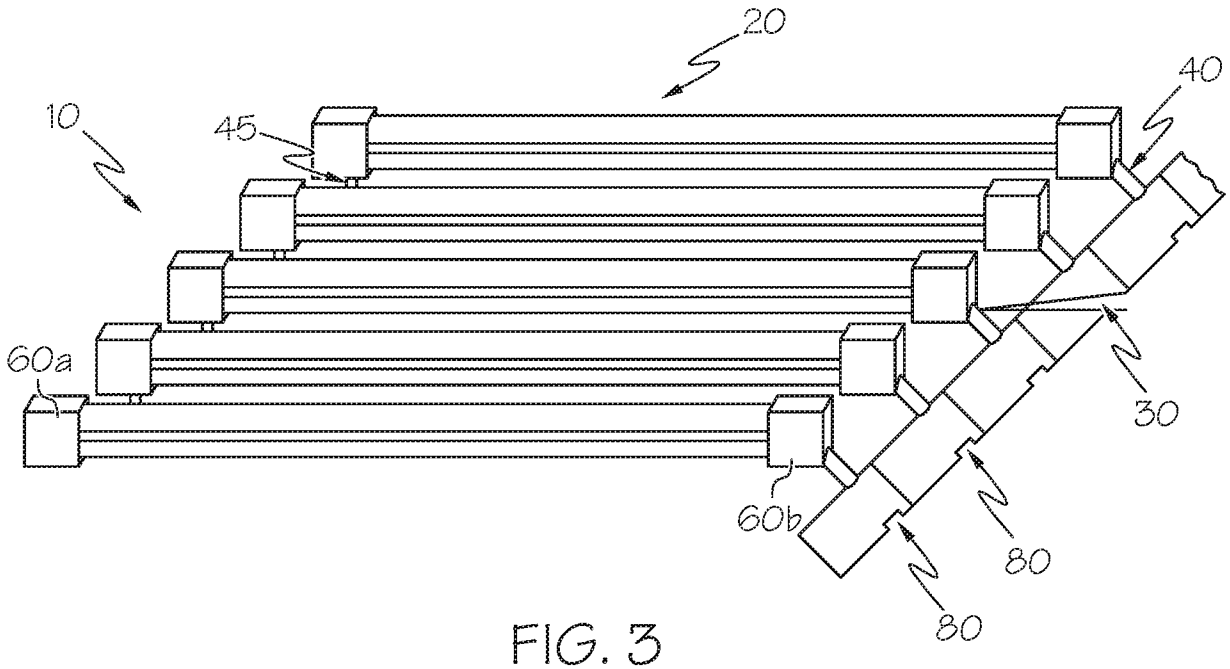


FIG. 3

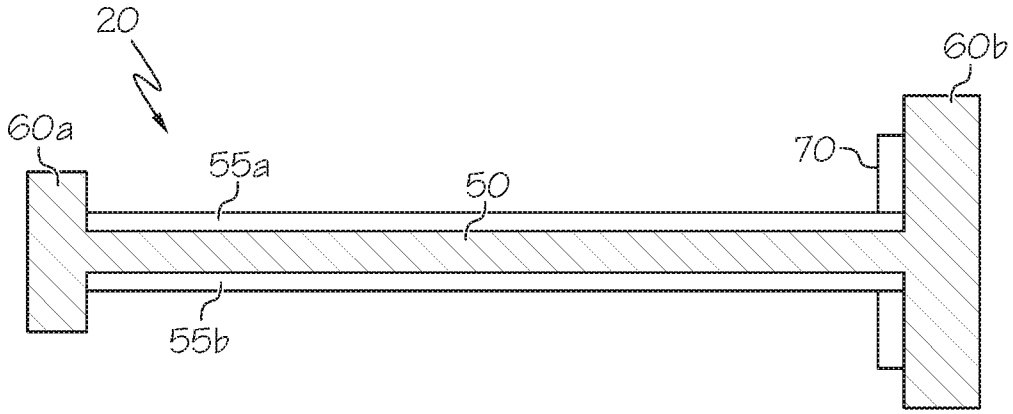


FIG. 4

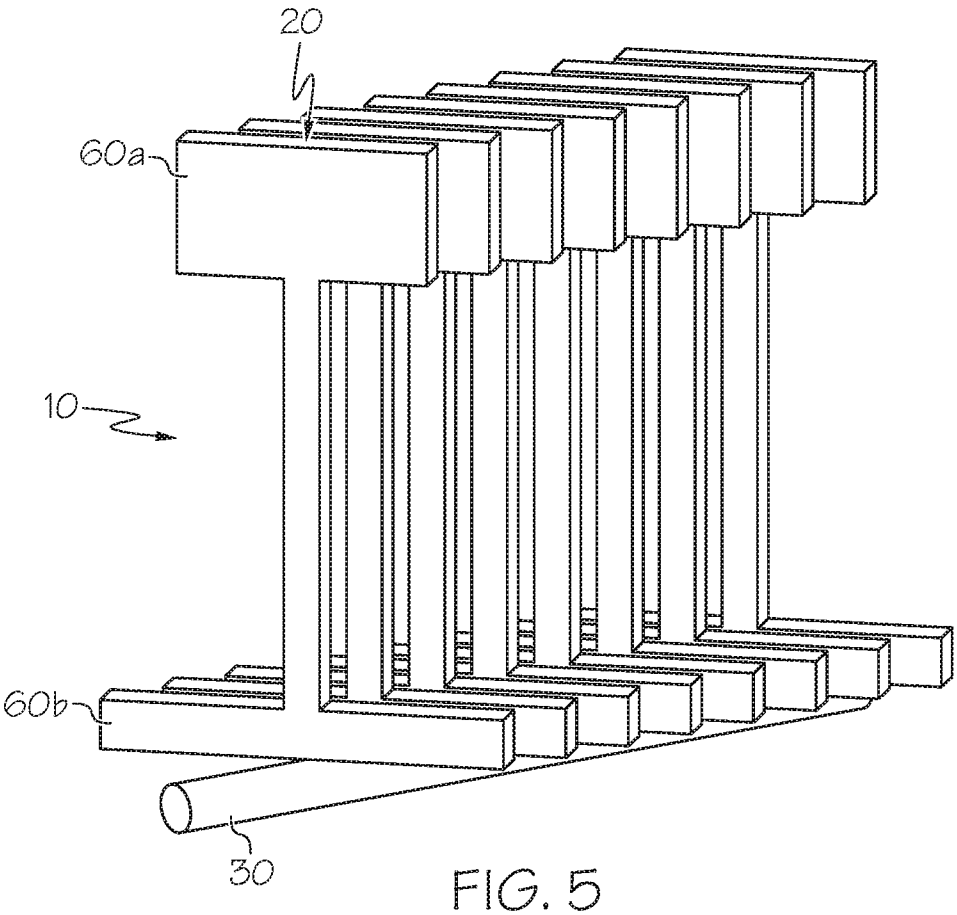


FIG. 5

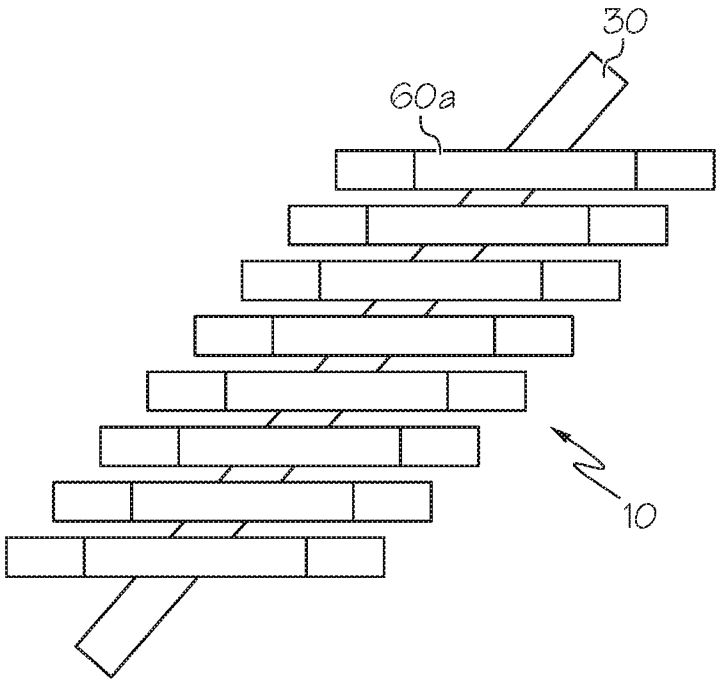


FIG. 6

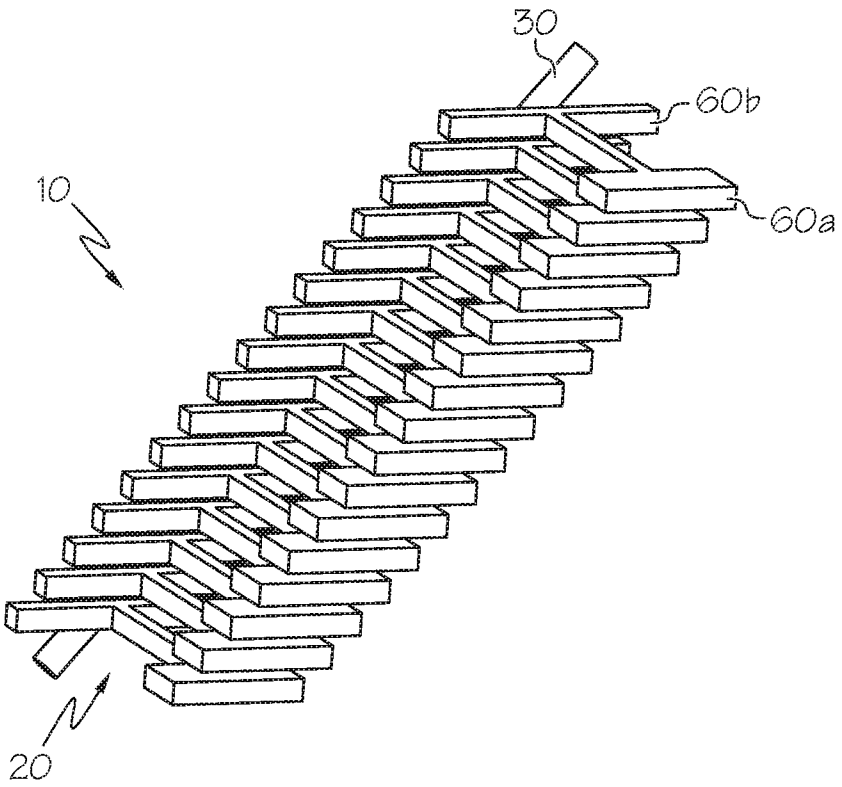


FIG. 7

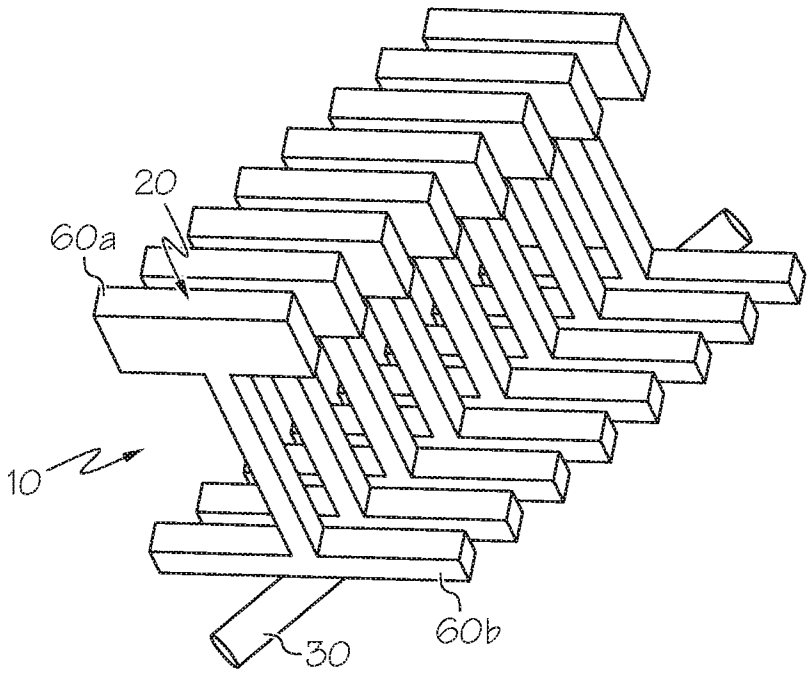


FIG. 8

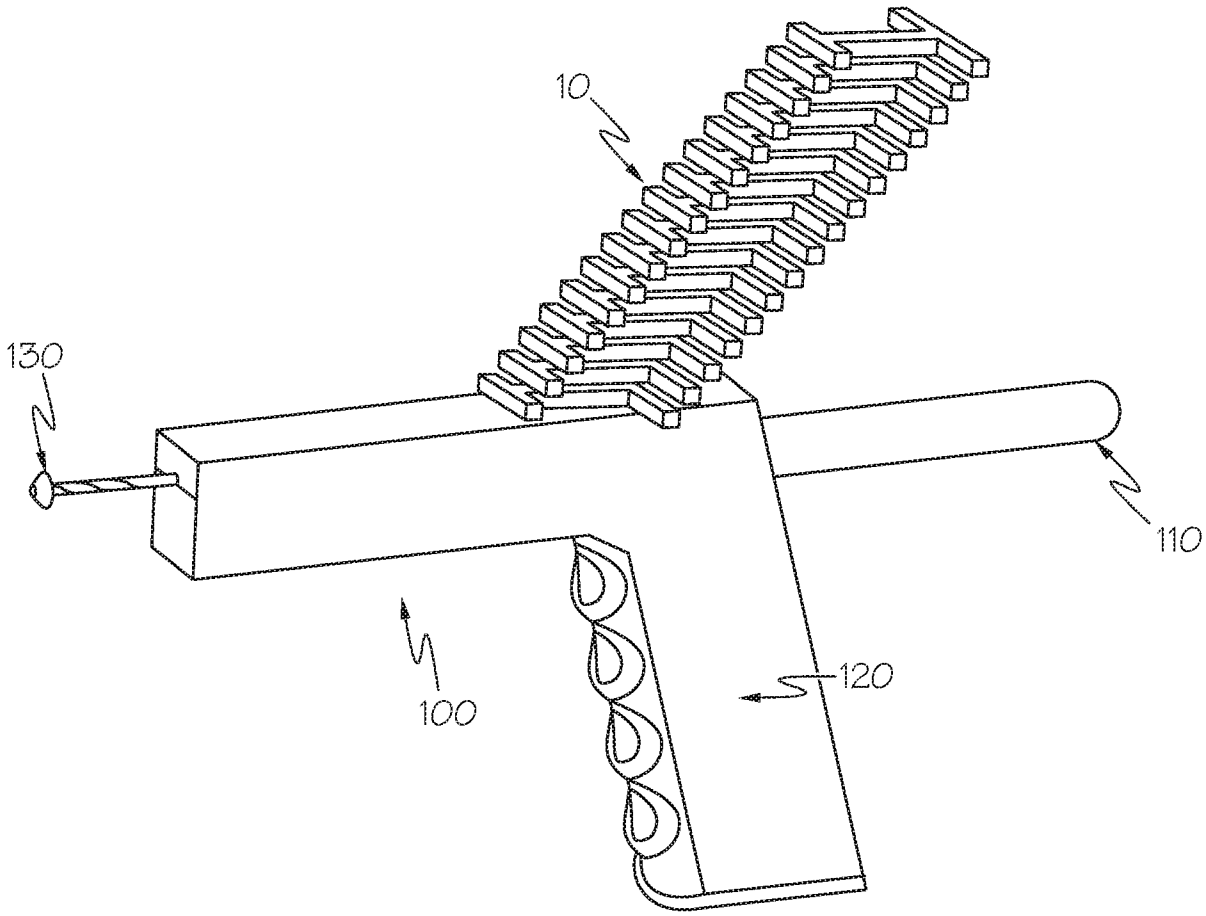


FIG. 9

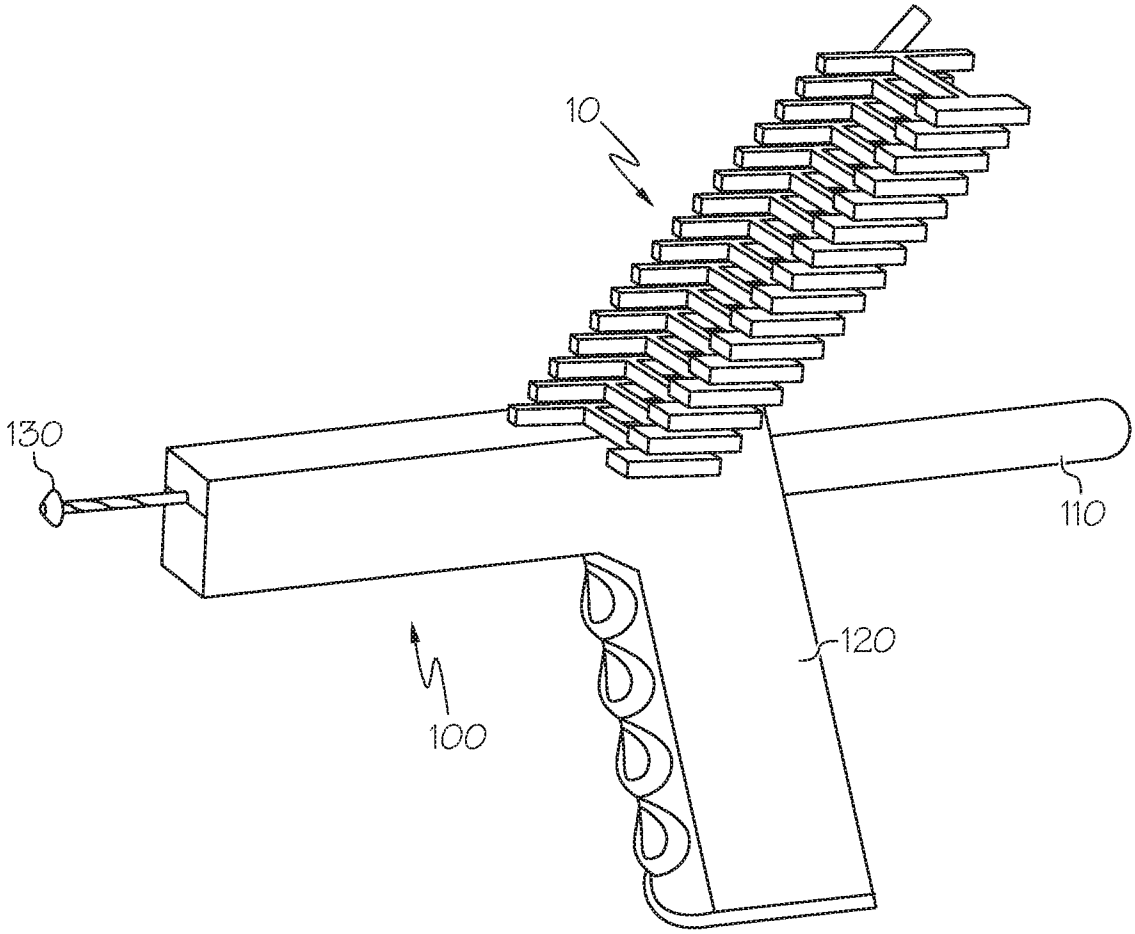


FIG. 10

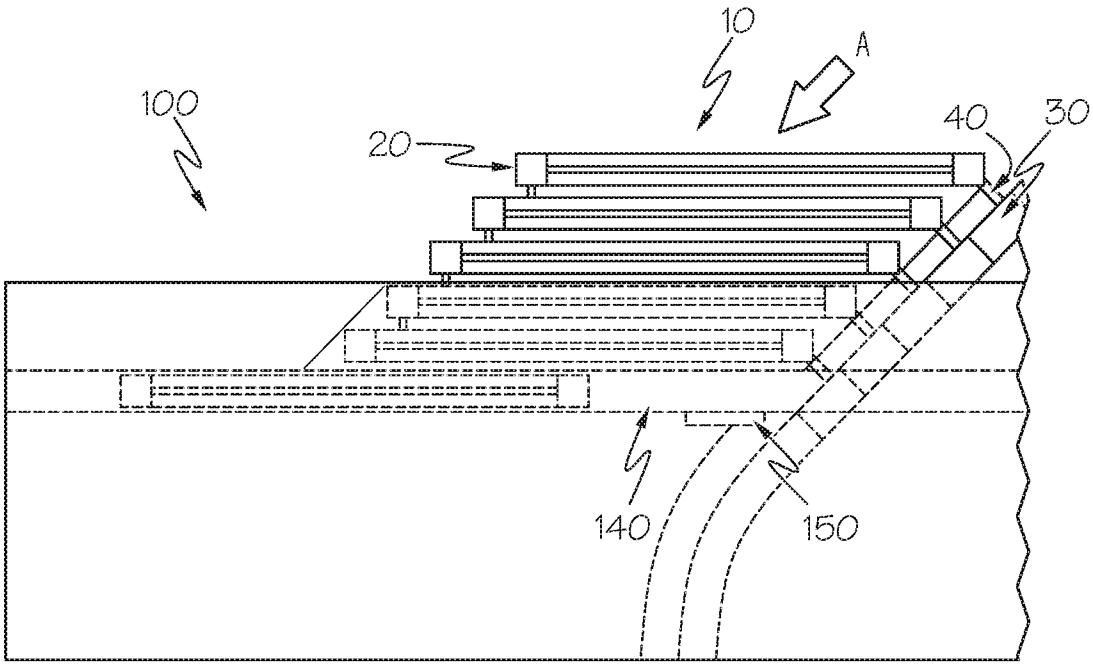


FIG. 11

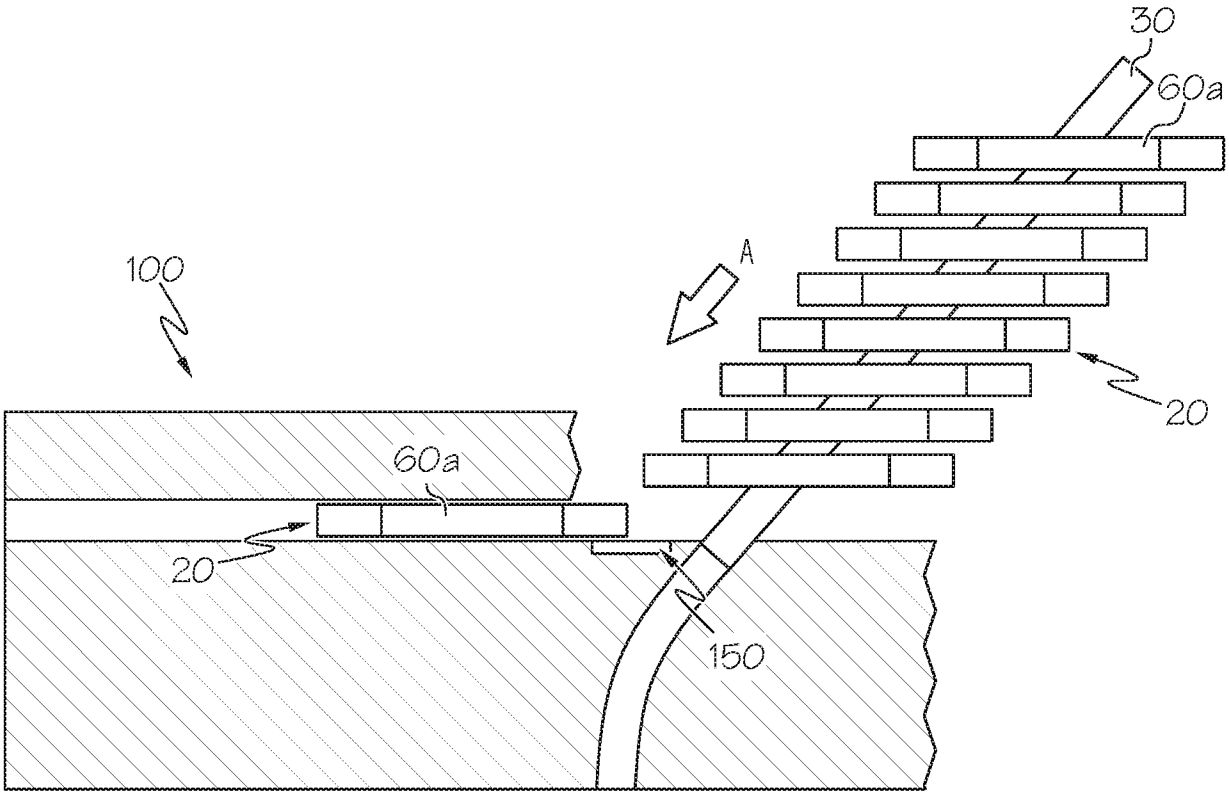


FIG. 12

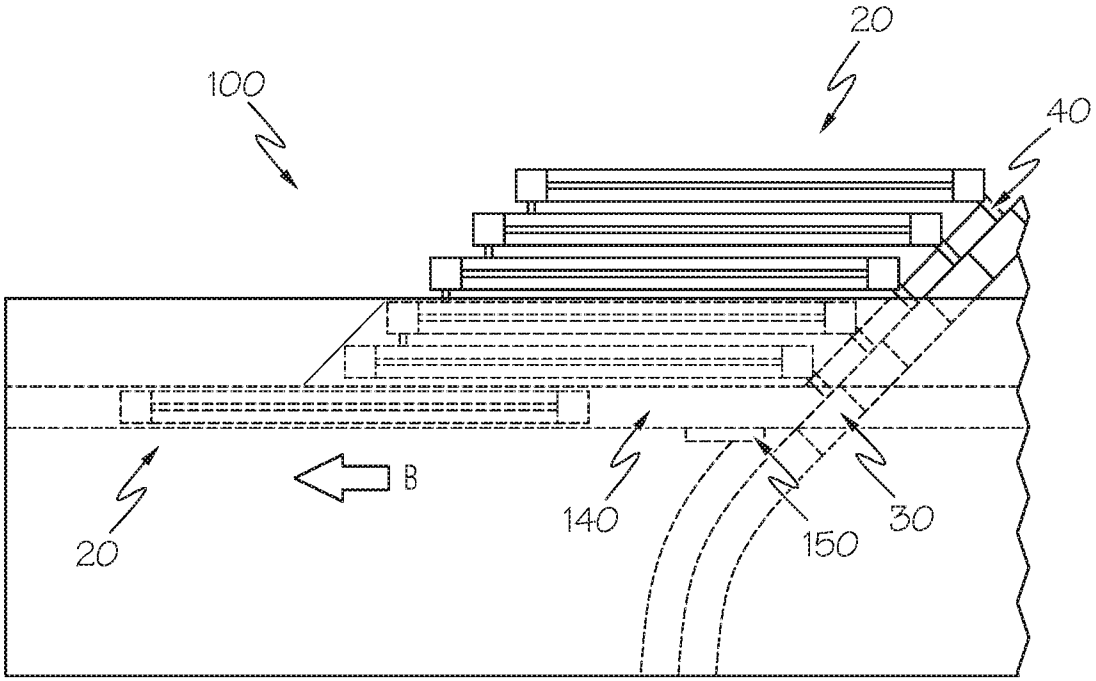


FIG. 13

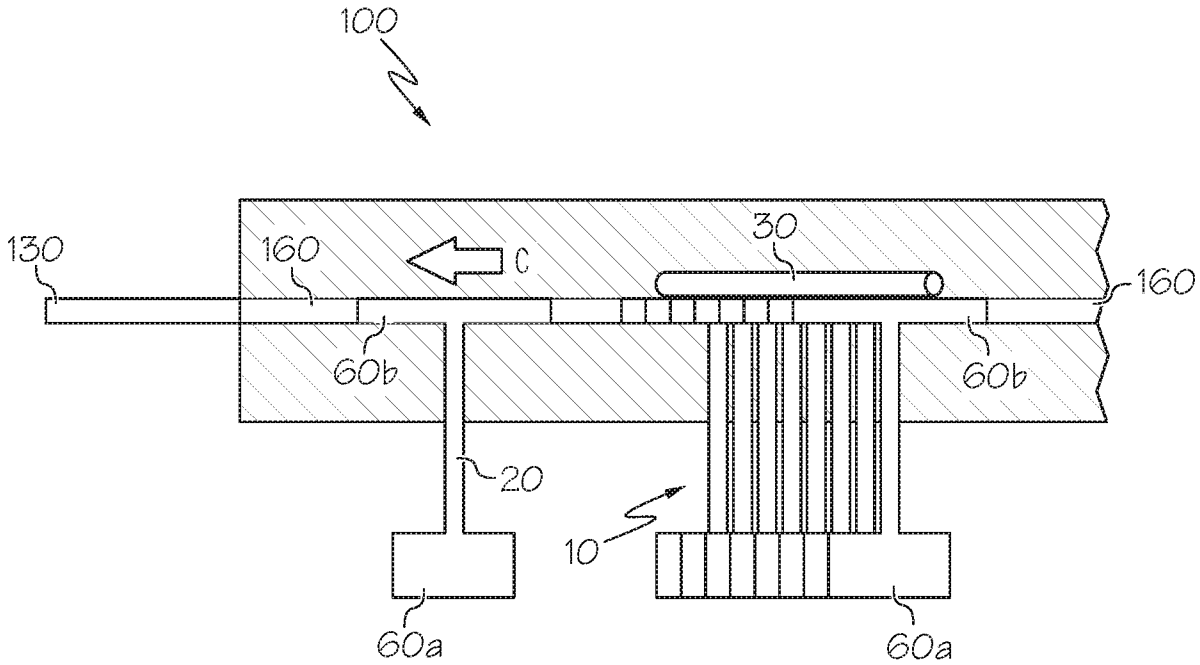


FIG. 14

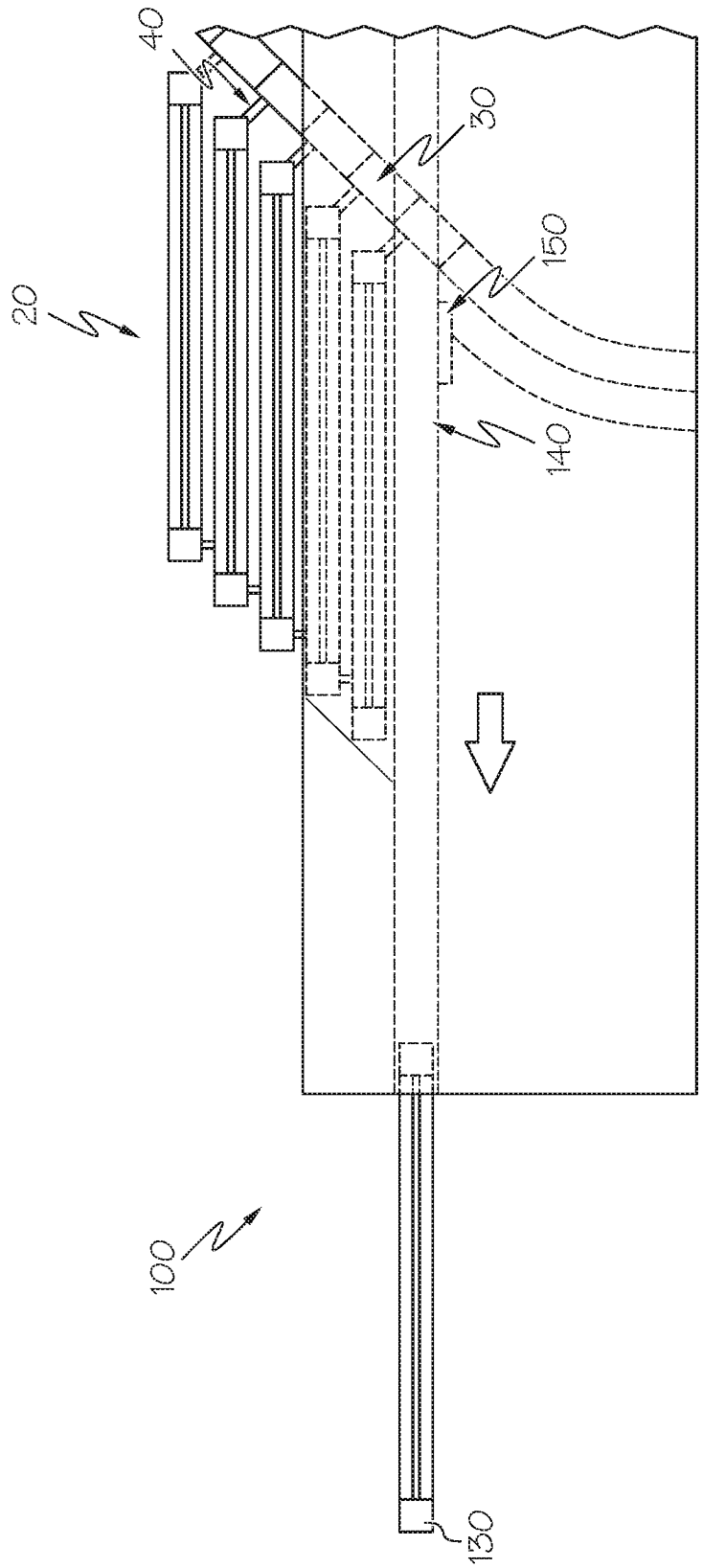


FIG. 15

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/021732

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65C7/00 G09F3/14
ADD.

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)
B65C B67C G09F

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.
X	EP 0 888 727 A2 (KUNREUTHER STEVEN J [US]) 7 January 1999 (1999-01-07) abstract; figures 1-13 column 6, line 36 - column 11, line 4	1-25
X	EP 1 329 867 A1 (KOTECS CO LTD [JP]; SANYO SEISAKUSHO CO LTD [JP]) 23 July 2003 (2003-07-23) figures 1-17 paragraphs [0028] - [0122]	1-3,5-9, 11-25
A	US 3 900 925 A (LA TORRACA GERARD A) 26 August 1975 (1975-08-26) abstract; figures 1-14	1-25

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 July 2019	09/07/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Pardo Torre, Ignacio

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/021732

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0888727 A2	07-01-1999	AT 278334 T	15-10-2004
		DE 69826767 D1	11-11-2004
		EP 0888727 A2	07-01-1999
		TR 199801277 A2	21-10-1999
		US 5810238 A	22-09-1998
EP 1329867 A1	23-07-2003	AT 337596 T	15-09-2006
		CN 1432516 A	30-07-2003
		DE 60307689 T2	07-12-2006
		EP 1329867 A1	23-07-2003
		JP 4100917 B2	11-06-2008
		JP 2003216048 A	30-07-2003
		KR 20030063182 A	28-07-2003
		TW 593076 B	21-06-2004
		US 2003137154 A1	24-07-2003
US 3900925 A	26-08-1975	NONE	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/021732

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1-25(partially)
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Continuation of Box II.2

Claims Nos.: 1-25(partially)

ART. 6 AND 17(2)(a)(ii)(b) PCT - NO MEANINGFUL SEARCH POSSIBLE

The set of claims as originally filed is so unclear that a meaningful search over the whole scope of the claims is not possible. The reasons are as follows:

The claims have been drafted in such an unduly broad manner that virtually any known paddle-fastener stock, paddle-fastener applicator or method of applying such a paddle-fastener device from a stock by means of a known applicator anticipates the novelty of the claims. Indeed, the claims are so unduly broad, that they do not reflect the contribution to the art made by the present invention, as they encompass virtually any known device. A meaningful search over the whole scope of the claims is thus not possible.

Besides, the large number of independent claims (1, 16, 18, 19, 20, 24 and 25), having overlapping and/or redundant scope (e.g. claim 25 seems to be the combination of claims 1, 2 and 24), or with misleading introductory part (e.g. claims 16 and 17 are drafted as dependent on one of 1 to 15 whereas in practice they are directed to a sub-entity of the latter, i.e. the fastener device), makes the scope of the set of claims as a whole so unclear, that a skilled reader cannot established what subject-matter protection is intended for.

Consequently, a meaningful search is not possible under Art. 17(2)(a)(ii) PCT.

In his reply to the communication requesting clarification of the subject-matter to be searched, the applicant has filed a set of claims. The applicant has no right to amend the claims before issuance of the search report (Art. 19 PCT). However, this Authority understands from the reply of the applicant that the subject-matter to be searched is that of claims 1, 2 and 7, in combination. Consequently, the present search report has been issued with respect to all claims as originally filed, but additionally restricted by the technical features of claims 2 and 7.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried

out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.