(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 November 2014 (27.11.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/190055 A2

(51) International Patent Classification:
B65B 31/04 (2006.01)

(21) International Application Number:
PCT/US2014/038969

(22) International Filing Date:
21 May 2014 (21.05.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/826,002 21 May 2013 (21.05.2013) US
61/868,945 22 August 2013 (22.08.2013) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

WO 2014/190055 A2

(54) Title: DUAL HEAT STRIP AND REMOVABLE TRAY FOR A VACUUM SEALING MACHINE

(57) Abstract: A vacuum sealing machine includes a base assembly having an upper base portion removably secured to a lower base portion and displacing relative to the lower base portion from a closed position to an open position. Two or more heating strips are disposed on the lower base portion, and each of the heating strips is adapted to seal a portion of an open end of a sealable bag disposed between the lower and upper base portions. At least one securement feature is disposed on the upper base portion and is adapted to apply pressure to a portion of the open end of the inserted sealable bag when the sealable bag is sealed by at least one of the heating strips. In addition, A control unit including at least one microprocessor and a memory unit is in communication with each of the two or more heating strips.

DUAL HEAT STRIP AND REMOVABLE TRAY FOR A VACUUM SEALING MACHINE

FIELD OF THE DISCLOSURE

[0001] This disclosure relates generally to machines that preserve food, and, more particularly, to vacuum sealing machines.

BACKGROUND

[0002] Vacuum sealing machines are typically used by consumers to package a desired portion of perishable items (*e.g.*, food, such as meat) in a manner that preserves the food during long term-storage, such as storage in a freezer. To use the vacuum sealing machine, the desired portion of food is placed in an open end of an appropriately-sized plastic sealable bag. The open end of the bag is then inserted into a receiving portion, such as a slot, of the vacuum sealing machine, and a vacuum process is initiated by the user to evacuate air from the interior of the bag. When the air evacuation process is complete, a heat sealer creates a transverse seal across the open end of the bag to create a completely sealed package enclosing the portion of food.

[0003] Typically, a large quantity of food is vacuum sealed at the same time. In such instances, frequent use causes the temperature of the heat sealer to rise and remain at unacceptable levels. When at such levels, placing the open end of the bag in contact with the heat sealer, which occurs during the air evacuation process, results in unwanted sealing of the bag before air is fully evacuated. To avoid such unwanted premature sealing, the heat sealer must be allowed to cool between uses to a temperature in which no premature sealing of the bag occurs. However, it is difficult for the user to determine when the temperature falls to an

acceptable level, and the user wastes a significant amount of time waiting for the temperature to fall.

[0004] In addition, food particles and liquid can spill out of the open end of the bag and into a vacuum chamber formed in an interior portion of the vacuum sealing machine during the air evacuation process. Such a vacuum chamber is typically difficult to access when it is desired to clean the vacuum chamber after use. Further, a user typically uses a single-sized open-ended plastic sealable bag regardless of the size of the portion to be preserved. Thus, bag space is wasted or multiple bags are used when a single, larger bag is desired.

[0005] Accordingly, there is a need for a vacuum sealing machine that does not prematurely seal an open end of a sealable bag and does not require significant downtime to wait for the heat sealer to cool. There is also a need for a more accessible vacuum chamber to make cleaning more convenient. Moreover, there is a need for a custom bag creator that easily allows for the creation of a desired bag size.

BRIEF SUMMARY OF THE DISCLOSURE

[0006] A vacuum sealing machine includes a base assembly having a lower base portion having a lower vacuum gasket and an upper base portion removably secured to the lower base portion, the upper base portion having an upper vacuum gasket. The upper base portion displaces relative to the lower base portion from a first closed position to a second open position, and the lower vacuum gasket and the upper vacuum gasket cooperate to at least partially define a vacuum chamber in the first closed position. The vacuum sealing machine also includes two or more heating strips disposed on a first one of the lower base portion or the upper base portion of the base assembly, and each of the two or more heating strips is

adapted to seal a portion of an open end of a sealable bag disposed between the lower base portion and the upper base portion. The vacuum sealing machine further includes at least one securement feature disposed on a second one of the lower base portion or the upper base portion of the base assembly, and the at least one securement feature is adapted to apply pressure to a portion of the open end of the inserted sealable bag when the sealable bag is sealed by at least one of the heating strips. In addition, the vacuum sealing machine includes a control unit including at least one microprocessor and a memory unit, and the control unit is in communication with each of the two or more heating strips.

[0007] A method of controlling a vacuum sealing machine having a lower base portion and an upper base portion that displaces relative to the lower base portion from a first closed position to a second open position includes issuing a first command by a control unit of the vacuum sealing machine to energize a first heating strip disposed on one of the lower base portion or the upper base portion to heat a portion of an open end of a first sealable bag disposed between the lower base portion and the upper base portion in the first closed position. The method also includes issuing a second command by the control unit of the vacuum sealing machine to energize a second heating strip disposed adjacent to the first heating strip disposed on one of the lower base portion or the upper base portion to heat a portion of an open end of a second sealable bag disposed between the lower base portion and the upper base portion in the first closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Figure 1 is a first perspective view of an embodiment of a lower base portion of a vacuum sealing machine;

[0009] Figure 2 is a second perspective view of the embodiment of the lower base portion of Figure 1;

[0010] Figure 3 is a third perspective view of the embodiment of the lower base portion of Figure 1;

[0011] Figure 4 is a rear view of the embodiment of the lower base portion of Figure 1;

[0012] Figure 5 is a front view of the embodiment of the lower base portion of Figure 1;

[0013] Figure 6 is a first side view of the embodiment of the lower base portion of Figure 1;

[0014] Figure 7 is a second side view of the embodiment of the lower base portion of Figure 1;

[0015] Figure 8 is a perspective view of an embodiment of an upper base portion of a vacuum sealing machine;

[0016] Figure 9 is a side view of an embodiment of a vacuum sealing machine in a closed position;

[0017] Figure 10 is a perspective view of an embodiment of a vacuum sealing machine in an open position;

[0018] Figure 11 is a first side view of an embodiment of a vacuum sealing machine in an open position;

[0019] Figure 12 is a second side view of an embodiment of a vacuum sealing machine in an open position;

[0020] Figure 13 is a perspective view of an first upper hinge member or second upper hinge member;

[0021] Figure 14 is a perspective view of an embodiment of a vacuum sealing machine in an open position;

[0022] Figure 15 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0023] Figure 16 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0024] Figure 17 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0025] Figure 18 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0026] Figure 19 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0027] Figure 20 is diagram of an embodiment of a control function of an embodiment of a custom bag assembly;

[0028] Figure 21 is a perspective view of an embodiment of a housing including a vacuum sealing machine and a custom-sized bag creator assembly;

[0029] Figures 22A to 22C are various views of an embodiment of a housing including a vacuum sealing machine and a custom-sized bag creator assembly;

[0030] Figures 23 to 26 are various perspective views of various embodiments of a housing including a vacuum sealing machine and a custom-sized bag creator assembly;

[0031] Figures 27A to 34 are various front views of various embodiments of a housing including a vacuum sealing machine and a custom-sized bag creator assembly;

[0032] Figure 35A is a front view of an embodiments of a housing including a vacuum sealing machine and a custom-sized bag creator assembly; and

[0033] Figure 35B is a sectional view taken along line A-A of Figure 35A.

DETAILED DESCRIPTION

[0034] As illustrated in Figures 1 to 14, a base assembly 10 of a vacuum sealing machine may include a lower base portion 12 and an upper base portion 14 that cooperate to (1) form a vacuum chamber to evacuate fluid, such as air, from an open end of an inserted sealable bag and (2) seal (*e.g.*, heat seal) the open end of the inserted sealable bag, such as a plastic bag. Either (or both) of the lower base portion 12 and the upper base portion 14 may include a plurality of heating areas, such as heating strips 16, and either or both of the lower base portion 12 and the upper base portion 14 may include a securement feature (such as an elongated gasket) that applies pressure to a portion of the open end of the inserted sealable bag when the sealable bag is sealed by one or more of the plurality of heating areas.

[0035] In the embodiment illustrated in Figures 1 to 7, the lower base portion 12 may include two heating strips 16a, 16b, and each heating strip 16a, 16b may be elongated and may extend along a longitudinal axis 18a, 18b that may each be parallel to the Y-axis of the reference coordinate system provided in Figure 1. Each of the two heating strips 16a, 16b may extend from a first end to a longitudinally-opposite second end. The first end may be disposed at or adjacent to a first lateral edge portion of the lower base portion 12 and the

second end may be disposed at or adjacent to a second lateral edge portion of the lower base portion 12. Instead of a single heat strip extending from the first end to the second end, each strip may be an assembly of segments that cooperate to form the heating strip, and the segments may cooperate to extend from the first end to the second end. Each of the two heating strips 16a, 16b may be identical, and each of the two heating strips 16a, 16b may be disposed parallel to a longitudinal axis 20a of an elongated vacuum gasket 22a that at least partially defines a vacuum chamber 24 (*e.g.*, see Figure 9). While two heating strips 16a, 16b are illustrated, any number of heating strips in any configuration is contemplated. Each heating strip 16a, 16b may provide heat in any suitable manner, such as by electrical resistance. Accordingly, each heating strip 16a, 16b may be connected to a source of electricity. Each heating strip 16a, 16b may be in communication with a control unit that may include at least one microprocessor and a memory unit.

[0036] In the embodiment illustrated in Figure 8, the upper base portion 14 may be adapted to releasably engage or couple with the lower base portion 12 in a closed position (illustrated in cross-section in Figure 9). The upper base portion 14 may releasably engage the lower base portion 12 manually or automatically. For example, the user may pivot the upper base portion 14 towards the lower base portion 12. In the closed position, a vacuum gasket 22b of the upper base portion 14 may be aligned or substantially aligned with the vacuum gasket 22a of the lower base portion 12, and the vacuum gasket 22b of the upper base portion 14 and the vacuum gasket 22a of the lower base portion 12 may cooperate to define the vacuum chamber 24. The upper base portion 14 may include a plurality of securement features 26. Each securement feature 26 may be an elongated gasket 27a, 27b having a planar or slightly curved bottom portion that overlaps or contacts a corresponding portion of a corresponding

one of the heating strips 16a, 16b when the upper and lower base portions 12, 14 are in the closed position (and when a bag or other item to be sealed is not disposed over the heating strip 16a, 16b). In the closed position with a sealable bag inserted, the securement features 26 provide pressure to the portion or portions of the sealable bag that engage (*i.e.*, are heated by) the heating strips 16a, 16b to form an airtight seal across the open end of the sealable bag.

[0037] While the Figures illustrate that the two heating strips 16a, 16b are arranged on the lower base portion 12 and the elongated gaskets 27a, 27b are disposed on the upper base portion 14, the two heating strips 16a, 16b may be arranged on the upper base portion 14 and the elongated gaskets 27a, 27b may be disposed on the lower base portion 12.

[0038] Each of the plurality of securement features 26 may correspond in length, orientation, and general size to a corresponding heating strip 16a, 16b. For example, the upper base portion 14 may include two gaskets 27a, 27b that each extend along a longitudinal axis 28a, 28b that may each be parallel to the Y-axis of the reference coordinate system provided in Figure 1. Each of the two gaskets 27a, 27b may extend from a first end to a longitudinally-opposite second end. The first end may be disposed at or adjacent to a first lateral edge portion of the upper base portion 14 and the second end may be disposed at or adjacent to a second lateral edge portion of the upper base portion 14. Instead of each gasket being a single gasket 27a, 27b extending from the first end to the second end, each gasket 27a, 27b may be an assembly of segments that cooperate to form the gaskets 27a, 27b, and the segments may cooperate to extend from the first end to the second end. Each of the two gaskets 27a, 27b may be identical, and each of the two gaskets 27a, 27b may be disposed parallel to the longitudinal axis 20b of the elongated vacuum gasket 22b. While two gaskets

27a, 27b are illustrated, any number of gaskets 27a, 27b in any suitable configuration may be used.

[0039] As illustrated in Figures 10 to 14, the lower base portion 12 may include one or more lower mating features 30 and the upper base portion 14 may include one or more upper mating features 32 that cooperate with the lower mating features 30 to couple the lower base portion 12 to the upper base portion 14. In the embodiment illustrated in Figures 10 to 12, the one or more upper mating features 32 may cooperate with the lower mating features 30 to removably and rotatably couple the lower base portion 12 to the upper base portion 14. However, the one or more upper mating features 32 may cooperate with the lower mating features 30 to couple the lower base portion 12 to the upper base portion 14 in a non-removable manner such that the one or more upper mating features 32 may cooperate with the lower mating features 30 to form a permanent hinge.

[0040] As illustrated in Figures 1 and 2, the one or more lower mating features 30 may include a first lower hinge member 34a and a second lower hinge member 34b disposed on the lower base portion 12. The first lower hinge member 34a may be disposed along or adjacent to a lateral edge 36 of the lower base portion 12 that is parallel to (or substantially parallel to) the Y-axis of the reference coordinate system of Figures 1 and 10, and the vacuum gasket 22a may be disposed between the two heating strips 16a, 16b and the lateral edge 36. The first lower hinge member 34a may also be disposed along or adjacent to a first transverse edge 38 of the lower base portion 12 that is parallel to (or substantially parallel to) the X-axis of the reference coordinate system of Figures 1 and 10. The second lower hinge member 34b may be disposed along or adjacent to the lateral edge 36 of the lower base portion 12 that is parallel to (or substantially parallel to) the Y-axis of the reference

coordinate system of Figure 10. The second lower hinge member 34b may also be disposed along or adjacent to a second transverse edge 40 of the lower base portion 12 that is parallel to (or substantially parallel to) the first transverse edge 38.

[0041] As illustrated in Figures 1, 10, and 12, the first lower hinge member 34a may include a support portion 42a, and a receiving portion 44a that may be defined in a surface of the support portion 42a. The receiving portion 44a may be an aperture formed through the surface of the support portion 42a or may be a cavity formed by a portion of a cylindrical wall that extends inward (*i.e.*, along or parallel to the Y-axis of the reference coordinate system of Figure 10) from the surface of the support portion 42a. The aperture or cavity may have a circular cross-sectional shape or any suitable cross-sectional shape. The aperture or cavity may extend along a longitudinal axis that extends along or parallel to the Y-axis of the reference coordinate system of Figure 10.

[0042] As illustrated in Figures 2, 10, and 11, the second lower hinge member 34b may include a support portion 42b, and a receiving portion 44b may be defined in a surface of the support portion 42b. The second lower hinge member 34b may be identical to, but a mirror image of, the first lower hinge member 34a. Specifically, the receiving portion 44b may be a aperture formed through the surface of the support portion 42b or may be a cavity formed by a portion of a cylindrical wall that extends inward (*i.e.*, along or parallel to the Y-axis of the reference coordinate system of Figure 10 and towards the first transverse edge 38) from the surface of the support portion 42b. The aperture or cavity may extend along a longitudinal axis that extends along or parallel to the Y-axis of the reference coordinate system of Figure 10.

[0043] As illustrated in Figures 10 to 12, the upper base portion 14 may include one or more upper mating features 32, and the one or more upper mating features 32 may include a first upper hinge member 46a and a second upper hinge member 46b. The first upper hinge member 46a may be adapted to releasably engage the first lower hinge member 34a, and the second upper hinge member 46b may be adapted to releasably engage the second lower hinge member 34b.

[0044] Still referring to Figures 10 to 12, the first upper hinge member 46a may include a cantilevered tab portion 48a that extends generally along the Z-axis of the reference coordinate system of Figure 10 when the upper base portion 14 is in the closed position. The tab portion 48a may be disposed along or adjacent to a lateral edge 50 of the upper base portion 14 that is parallel to (or substantially parallel to) the Y-axis of the reference coordinate system of Figure 10. The tab portion 48a may also be disposed along or adjacent to a first transverse edge 52 (see Figure 10) of the upper base portion 14 that is parallel to (or substantially parallel to) the X-axis of the reference coordinate system of Figure 10.

[0045] As illustrated in Figure 13, a projection 54a may be disposed on or extend from a surface of the tab portion 48a that faces the surface of the support portion 42a of the first lower hinge member 34a that includes the receiving portion 44a when the lower base portion 12 is coupled to the upper base portion 14. The projection 54a may have a front face 56a and a side wall 58a, and the side wall 58a may have a cylindrical shape having a longitudinal axis that extends along or parallel to the Y-axis of the reference coordinate system of Figure 10. The longitudinal axis of the side wall 58a of the projection 54a may coaxially align with the longitudinal axis of the aperture or cavity of the receiving portion 44a of the first lower hinge member 34a, and all or a portion of the projection 54a (such as all or part of the side wall 58a

of the projection 54a) may be received into the aperture or cavity of the receiving portion 44a such that the projection 54a may rotate within the aperture or cavity of the receiving portion 44a. The projection 54a may be dimensioned such that the diameter may be slightly less than (*e.g.*, 5% to 15% less that) the diameter of the aperture or cavity of the receiving portion 44a. The front face 58a may be planar or partially planar, and may extend along the X-Z plane of the reference coordinate system of Figure 10. Alternatively, the front face 56a may be angled to facilitate the insertion of the projection 54 within the receiving portion 44a. In other contemplated embodiments, the front face 56a may be or include a contoured surface, such as a spherical surface, and the side wall 58a and the front face 56a may cooperate to form a rounded nub or spherical nub. The tab portion 48a may be cantilevered from a bottom portion of the upper base portion 14 such that the tab portion 48a may flex in the direction of the Y-axis of the reference coordinate system of Figure 10 to allow the projection 54a to be inserted into (and removed from) the receiving portion 44a.

[0046] As illustrated in Figures 10 to 12, the one or more upper mating features 32 of the upper base portion 14 may include the second upper hinge member 46b. The second upper hinge member 46b may be adapted to releasably engage the second lower hinge member 34b, and the second upper hinge member 46b may be identical to, but a mirror image of, the first upper hinge member 46a. Specifically, the second upper hinge member 46b may include a cantilevered tab portion 48b that extends generally along the Z-axis of the reference coordinate system of Figure 10 when the upper base portion 14 is in the closed position. The tab portion 48b may be disposed along or adjacent to the lateral edge 52 of the upper base portion 14 that is parallel to (or substantially parallel to) the Y-axis of the reference coordinate system of Figure 10. The tab portion 48b may also be disposed along or adjacent

to a second transverse edge 60 (see Figure 11) that is parallel to and offset from the first transverse edge 52 of the upper base portion 14.

[0047] As illustrated in Figure 13, a projection 54b may be disposed on or extend from a surface of the tab portion 48a that faces the surface of the support portion 42b of the second lower hinge member 34b that includes the receiving portion 44b when the lower base portion 12 is coupled to the upper base portion 14. The projection 54b may have a front face 56b and a side wall 58b, and the side wall 58b may have a cylindrical shape having a longitudinal axis that extends along or parallel to the Y-axis of the reference coordinate system of Figure 10. The longitudinal axis of the side wall 58b of the projection 54b may coaxially align with the longitudinal axis of the aperture or cavity of the receiving portion 44b of the second lower hinge member 34b, and all or a portion of the projection 54b (such as all or part of the side wall 58b of the projection 54b) may be received into the aperture or cavity of the receiving portion 44b such that the projection 54b may rotate within the aperture or cavity of the receiving portion 44b. The projection 54b may be dimensioned such that the diameter may be slightly less than (*e.g.*, 5% to 15% less that) the diameter of the aperture or cavity of the receiving portion 44b. The front face 58b may be planar or partially planar, and may extend along the X-Z plane of the reference coordinate system of Figure 10. Alternatively, the front face 56b may be angled to facilitate the insertion of the projection 54b within the receiving portion 44b. In other contemplated embodiments, the front face 56b may be or include a contoured surface, such as a spherical surface, and the side wall 58b and the front face 56b may cooperate to form a rounded nub or spherical nub. The tab portion 48b may be cantilevered from a bottom portion of the upper base portion 14 such that the tab portion 48b

may flex in the direction of the Y-axis of the reference coordinate system of Figure 10 to allow the projection 54b to be inserted into (and removed from) the receiving portion 44b.

[0048] In alternative embodiments, the lower mating features 30 of the lower base portion 12 may include the first upper hinge member 46a and the second upper hinge member 46b, and the upper mating features 32 of the upper base portion 14 may include the first lower hinge member 34a and the second lower hinge member 34b. That is, the projections 54a, 54b may be disposed on the lower base portion 12 and the receiving portions 44a, 44b may be disposed on the upper base portion 14. The upper base portion 14 and/or the lower base portion 12 may each be a component of a housing assembly (*e.g.*, the housing assembly 15 illustrated in Figures 31 to 35B) or may each operate independent of the housing assembly.

[0049] As illustrated in Figure 2, the lower base portion 12 may include vacuum connections 62 and/or electrical connections 64 that operate as quick connections. That is, when the lower base portion 12 is inserted into the housing assembly, the vacuum connections 62 and/or electrical connections 64 automatically engage corresponding vacuum connections and/or electrical connections formed in the housing assembly.

[0050] In use, the lower base portion 12 and the upper base portion 14 may be in an open position in which the lower base portion 12 is offset from the upper base portion 14. More specifically, the lower mating features 30 may rotate relative to the upper mating features 32 (or vice versa). In the embodiment illustrated in Figures 10 to 12, the first lower hinge member 34a may rotate relative to the first upper hinge member 46a (or vice versa) and the second lower hinge member 34b may rotate relative to the second upper hinge member 46b (or vice versa). In the open position, the open end of the inserted sealable bag (that is sealed on three sides) is inserted within the inner perimeter of the vacuum gasket 22a. The upper

base portion 14 is then moved to the closed position (in any manner, such as by pivoting as previously described) such that the open end of the inserted sealable bag is disposed within the vacuum chamber 24. When a start command is given, such as by pressing a start button on an input device that is in communication with the control unit, air may be evacuated from the vacuum chamber 24 and from the interior of the sealable bag in a known manner. When the evacuation process is complete, one of the two (or more) heating strips 16a, 16b, such as the first heating strip 16a, is engaged or activated to seal the open edge of the bag and create a sealed bag that is sealed on four sides. The command to engage the first heating strip 16a may originate automatically from the control unit after the evacuation process is complete, or the command may be initiated by a user pressing a button on the input device. Air may continue to be evacuated from the vacuum chamber 24 during the sealing process, or the evacuation process may be terminated at any time prior to engagement or activation of one of the two (or more) heating strips 16a, 16b. Once the sealable bag is sealed, the lower base portion 12 is disengaged from the upper base portion 14 (in any manner, such as by pivoting as previously described). The sealable bag that is sealed can then be removed from the upper base portion 14 and/or the lower base portion 12. An additional bag may then be inserted within the vacuum chamber 24 as previously described, and a second one of the two (or more) heating strips 16a, 16b, such as the second heating strip 16b, is engaged or activated to seal the open end of the additional bag as previously described.

[0051] The sealing time may be predetermined by the control unit, or may be manually adjusted or controlled by the user. Sensors, such as heat sensors, may be in communication with the control unit to alert the control unit (or user) that the transverse seal is secure.

[0052] Each of the heating strips 16a, 16b may alternate after each use, or may alternate after a predetermined number of uses. The sensor(s) may also allow the control unit to automatically alternate heating strips 16a, 16b if a limit temperature is reached. In some applications, both heating strips 16a, 16b may be employed simultaneously to form two parallel transverse seals that improves bond strength.

[0053] Accordingly, the two (or more) heating strips 16a, 16b allow the user of a vacuum sealer machine to continuously utilize the machine without waiting the usual "cool down" period in which the temperature of single heating strip decreases. That is, one of the two (or more) heating strips 16a, 16b will always be in a cool-down state. Existing vacuum sealing machines having a single heat strip require an average 20 seconds of "cool down" between cycles and usually after 8 continuous cycles a 20 minute "cool down." These cool down periods can be eliminated with the two (or more) heating strips 16a, 16b of the current configuration.

[0054] To facilitate cleaning, the lower base portion 12 and the upper base portion 14 are removable, as mentioned. To disengage the lower base portion 12 from the upper base portion 14, the first upper hinge member 46a and the second upper hinge member 46b are displaced such that the projections 54a, 54 are no longer received into the receiving portions 44a, 44b of the first and second lower hinge members 34a, 34b. The first and second upper hinge members 46a, 46b may be manually displaced by flexing the tab portions 48a, 48b by an outward force (i.e., away from the lower base portion 12) applied along the Y-axis of the reference coordinate system of Figure 10. Instead of manual displacement, the projections 54a, 54b may be retracted or extended by an automatic mechanism that may be controlled by a user's command. Alternatively, the first and second upper hinge members 46a, 46b may be

displaced by a displacement of the lower base portion 12 from the upper base portion 14 along the X-axis of the reference coordinate system of Figure 10. When removed, the lower base portion 12 may be cleaned and the surface(s) that partially form(s) the vacuum chamber 24 may be drained of fluid. To reinstall the lower base portion 12, the installation is reversed. That is, the first and second upper hinge members 46a, 46b are displaced as described above, and the projections 54a, 54 are inserted into the receiving portions 44a, 44b of the first and second lower hinge members 34a, 34b. When the lower base portion 12 is coupled to the upper base portion 14 (and/or the housing assembly), the operating system may automatically reset itself. In addition, the vacuum connections 62 and/or electrical connections 64 are self wiping such that removing and inserting the lower base portion 12 from/into the housing assembly ensures secure and active electrical and pneumatic connections between the lower base portion 12 and the upper base portion 14 (and/or the housing assembly).

[0055] As illustrated in Figure 2, the lower base portion 12 may include vacuum connections 62 and/or electrical connections 64 that operate as quick connections. That is, when the lower base portion 12 is inserted into the housing assembly, the vacuum connections 62 and/or electrical connections 64 automatically engage corresponding vacuum connections and/or electrical connections formed in the housing assembly.

[0056] In another embodiment, a mechanism or assembly to create custom-sized bags is illustrated, and the custom-sized bags can be used in any suitable vacuum sealing machine, including the vacuum sealing machine previously described. The custom bag assembly 10 may be a portion of a vacuum sealing machine or may be a stand-alone device. The custom bag assembly 10 may include a roll of material that is pre-sealed along a first lateral edge and a second lateral edge but is not sealed between the first and second lateral edges. The length

of the roll (*i.e.*, the distance between the first and second lateral edges) may have any suitable value, such as 10" or 8". The roll may be mounted, or may be adapted to be mounted, inside the housing assembly.

[0057] The custom bag assembly 10 may also include one or more seal bar or pair of seal bars. The seal bar or pair of seal bars cooperate to form a transverse seal (*i.e.*, a seal that extends from the first lateral edge to the second lateral edge) on the material stored on the roll, and the transverse seal, the pre-sealed first lateral edge, and the pre-sealed second lateral edge may cooperate to form a sealable bag having a single open end that is adapted to be used in a suitable vacuum sealing machine. The seal bar or pair of seal bars may form any type of seal on the sealable bag, and the seal bar or pair of seal bars may have a heated portion to form a heat seal. The seal bars or pair of seal bars may be stationary and may disposed within an interior portion of the housing along a feed path of the material that is fed from the roll. Alternatively, the seal bars or pair of seal bars may displace relative to the roll, or the roll may displace relative to the seal bar or pair of seal bars. The seal bars or pair of seal bars may be the dual heat strip configuration previously described, and the use of the heat strips may alternate to reduce down time.

[0058] The custom bag assembly 10 may also include a cutting mechanism may be disposed along the feed path of the material that is fed from the roll, and the cutting mechanism may be disposed adjacent to the seal bar or pair of seal bars. The cutting mechanism may cut the material of the roll adjacent to the transverse seal to create an edge of a sealable bag having a single open end. The cutting mechanism may be powered in any suitable manner, such as by an electric motor that may be disposed within the housing.

[0059] The custom bag assembly 10 may also include a feeding mechanism that may advance the material along the feed path that is fed from the roll, and the feed path may extend from the roll to an outlet location of the custom bag assembly 10. The feeding mechanism may include one or more rollers and the rollers may be disposed at any suitable location along the feed path. The feeding mechanism may be disposed within the housing. The feeding mechanism may be powered by an electric motor that may be disposed within the housing.

[0060] The custom bag assembly 10 may also include a control unit that may be in communication with the feeding mechanism, the cutting mechanism, and the one or more seal bar or pair of seal bars. The control unit may include one or more microprocessors, and the control unit may be disposed in any suitable location, such as within the housing.

[0061] In operation, a custom bag of an adjustable length may be created by a user. Specifically, the user may initiate the process by entering a desired volume or length (*i.e.*, distance normal to the distance between the first lateral edge and the second lateral edge) of a sealable bag. The user may initiate the process by pressing one of a plurality of buttons or keys or areas on an input device (*e.g.*, a touchscreen device or a tactile keypad), and the input device may be in communication with the control unit. Each of the plurality of buttons may correspond to a preselected bag volume. For example, one button may correspond to a gallon-sized bag and a second button may correspond to a quart-sized bag. When a desired size is input (by pressing a corresponding button, for example), the control unit may command the feeding mechanism to advance a portion of the material of the roll to a predetermined location. One or more sensors that may be in communication with the control unit may be used to accurately position the roll. The control unit may then command the seal

bar or pair of seal bars to form a transverse seal at the portion of the material, and the control unit may next command the cutting mechanism to cut the material of the roll adjacent to the transverse seal to create an edge of a sealable bag having a single open end. The control unit may then command the feeding mechanism to advance the sealable bag to the output location, which may be a slot formed in the housing. A user may then remove the sealable bag from the slot, and the sealable bag may be ready to be vacuum sealed. In other embodiments, the seal bar or pair of seal bars may move relative to the roll to form a transverse seal at the portion of the material.

[0062] In addition to preset sizes, the custom bag assembly 10 may generate custom-sized sealable bags based on user input. For example, the user may initiate the process by pressing one of a plurality of buttons on the input device, such as an advance button in communication with the feeding mechanism that advances the roll to as long as the button is pressed. The outlet location may be disposed adjacent to the seal bar or pair of seal bars and the cutting mechanism so that the user can see the size of the bag prior to creating the transverse seal and cutting the transverse edge. When the user has determined that the roll has advanced to a desired location, the user may release the advance button. A second button, such as a seal button, may then be pressed by the user to create a desired transverse seal and cut edge as previously described. If necessary, the control unit may then command the feeding mechanism to advance the sealable bag to the output location. A user may then remove the sealable bag from the slot, and the sealable bag may be ready to be vacuum sealed. In other embodiments, the seal bar or pair of seal bars may move relative to the roll to form a transverse seal at the portion of the material.

[0063] The automatic bag creation feature takes the "guess work" out of creating a bag for the consumer. The consumer can purchase rolls of material in bulk, thus saving money and still be able to create a given bag size as if they purchased it directly from the store in a pre-cut size. The custom size bag creation also allows for flexibility in that the consumer is not limited to a specific bag size, but can create any desired bag size, based on the roll length.

[0064] Example process flow charts are provided in Figures 15 to 20.

[0065] While various embodiments have been described above, this disclosure is not intended to be limited thereto, and variations can be made to the disclosed embodiments.

WHAT IS CLAIMED IS:

1. A vacuum sealing machine comprising:

a base assembly comprising:

a lower base portion having a lower vacuum gasket; and

an upper base portion removably secured to the lower base portion, the upper base portion having an upper vacuum gasket, wherein the upper base portion displaces relative to the lower base portion from a first closed position to a second open position, and wherein the lower vacuum gasket and the upper vacuum gasket cooperate to at least partially define a vacuum chamber in the first closed position;

two or more heating strips disposed on a first one of the lower base portion or the upper base portion of the base assembly, wherein each of the two or more heating strips is adapted to seal a portion of an open end of a sealable bag disposed between the lower base portion and the upper base portion;

at least one securement feature disposed on a second one of the lower base portion or the upper base portion of the base assembly, the at least one securement feature adapted to apply pressure to a portion of the open end of the inserted sealable bag when the sealable bag is sealed by at least one of the heating strips; and

a control unit including at least one microprocessor and a memory unit, the control unit in communication with each of the two or more heating strips.

2. The vacuum sealing machine of claim 1, wherein the lower base portion includes two heating strips.

3. The vacuum sealing machine of claim 2, wherein the lower base portion includes two heating strips that are elongated and extend along a longitudinal axis.

4. The vacuum sealing machine of claim 3, wherein each of the two heating strips extends from a first end to a longitudinally-opposite second end, the first end being disposed at or adjacent to a first lateral edge portion of the lower base portion and the second end being disposed at or adjacent to a second lateral edge portion of the lower base portion.

5. The vacuum sealing machine of claim 1, wherein the upper base portion is releasably coupled with the lower base portion.

6. The vacuum sealing machine of claim 1, wherein the upper base portion pivots relative to the lower base portion from the first closed position to the second open position.

7. The vacuum sealing machine of claim 4, wherein the upper base portion includes two elongated gaskets having a bottom portion that overlaps or contacts a corresponding portion of a corresponding one of the heating strips when the upper and lower base portions are in the first closed position.

8. The vacuum sealing machine of claim 1, wherein the lower base portion includes one or more lower mating features and the upper base portion includes one or more upper mating features that cooperate with the lower mating features to removably and rotatably couple the lower base portion to the upper base portion.

9. The vacuum sealing machine of claim 1, wherein the lower base portion and the upper base portion are adapted to be received into a portion of a housing assembly.

10. The vacuum sealing machine of claim 9, wherein at least one of the lower base portion or the upper base portion includes at least one of vacuum connections or electrical connections that automatically engage corresponding vacuum connections and/or electrical connections formed on the housing assembly.

11. The vacuum sealing machine of claim 1, further comprising a first sensor in communication with a first of the two or more heating strips and a second sensor in communication with a first of the two or more heating strips, wherein both the first sensor and second sensor are in communication with the control unit.

12. The vacuum sealing machine of claim 10, wherein information from one of the first sensor or the second sensor is communicated to the control unit, and wherein the control unit determines which of the first heating strip and second heating strip to energeize based on the information from the one of the first sensor or the second sensor.

13. The vacuum sealing machine of claim 11, wherein the information is a temperature of the first heating strip or a temperature of the second heating strip.

14. A method of controlling a vacuum sealing machine having a lower base portion and an upper base portion that displaces relative to the lower base portion from a first closed position to a second open position, the method comprising:

issuing a first command by a control unit of the vacuum sealing machine to energize a first heating strip disposed on one of the lower base portion or the upper base portion to heat a portion of an open end of a first sealable bag disposed between the lower base portion and the upper base portion in the first closed position; and

issuing a second command by the control unit of the vacuum sealing machine to energize a second heating strip disposed adjacent to the first heating strip disposed on one of the lower base portion or the upper base portion to heat a portion of an open end of a second sealable bag disposed between the lower base portion and the upper base portion in the first closed position.

15. The method of claim 14, wherein the first command is issued by the control unit in response to information received by the control unit from a first sensor in communication with the first heating strip and the control unit.

16. The method of claim 15, wherein the second command is issued by the control unit in response to information received by the control unit from a second sensor in communication with the second heating strip and the control unit.

17. The method of claim 16, wherein at least one of the first command or the second command is issued automatically by the control unit.

18. The method of claim 16, wherein the first command is issued by the control unit in response to a reaching a temperature limit and wherein the second command is issued by the control unit in response to a reaching a temperature limit.

19. A method of creating a custom-sized bag having a single unsealed edge for use with a vacuum sealing machine, the method comprising:

determining by a control unit a width of a roll of bag material used to make the custom-sized bag;

determining by the control unit a desired bag volume of the custom-sized bag;

command a feeding mechanism to advance the roll of bag material a predetermined amount based on the desired bag volume, wherein the command to the feeding mechanism is issued by the control unit;

command at least one seal bar to energize to form a transverse seal across the roll of bag material when the roll of bag material advanced the predetermined amount, wherein the command to energize the at least one seal bar is issued by the control unit; and

command a cutting mechanism to activate to cut the roll of bag material adjacent to the transverse seal to create a sealable bag having a single open end and the desired bag volume, wherein the command to activate the cutting mechanism is issued by the control unit.

20. The method of claim 19, wherein determining the width of the roll of bag material is automatically determined by a sensor or determined by a user input.

21. The method of claim 19, wherein determining desired bag volume of the custom-sized bag is determined by a user input.

22. The method of claim 19, further comprising:

command the feeding mechanism to advance the sealable bag having the single open end to an output location.

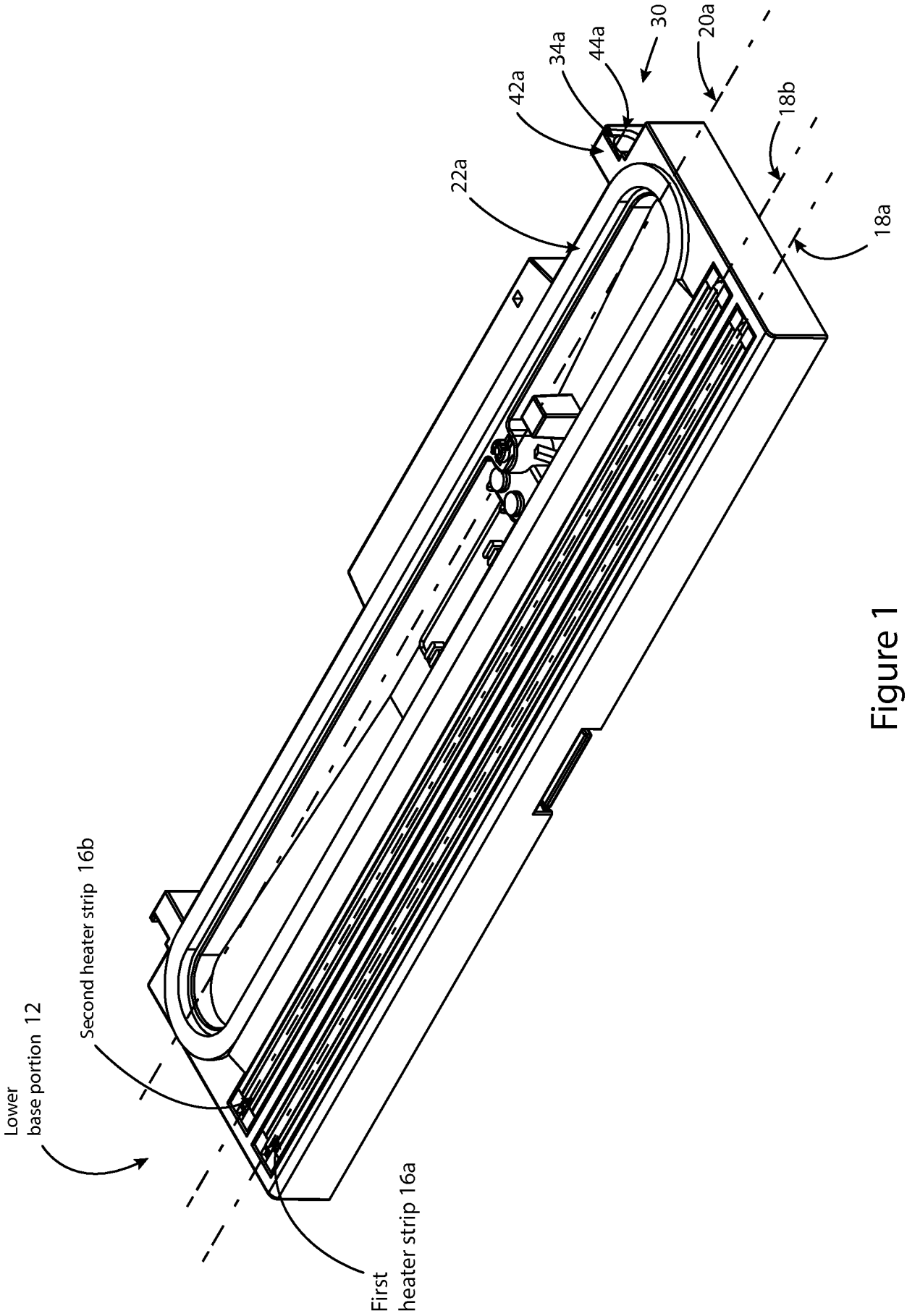

Lower
base portion 12
Second heater strip 16b
First
heater strip 16a
22a
42a
34a
44a
30
20a
18b
18a

Figure 1

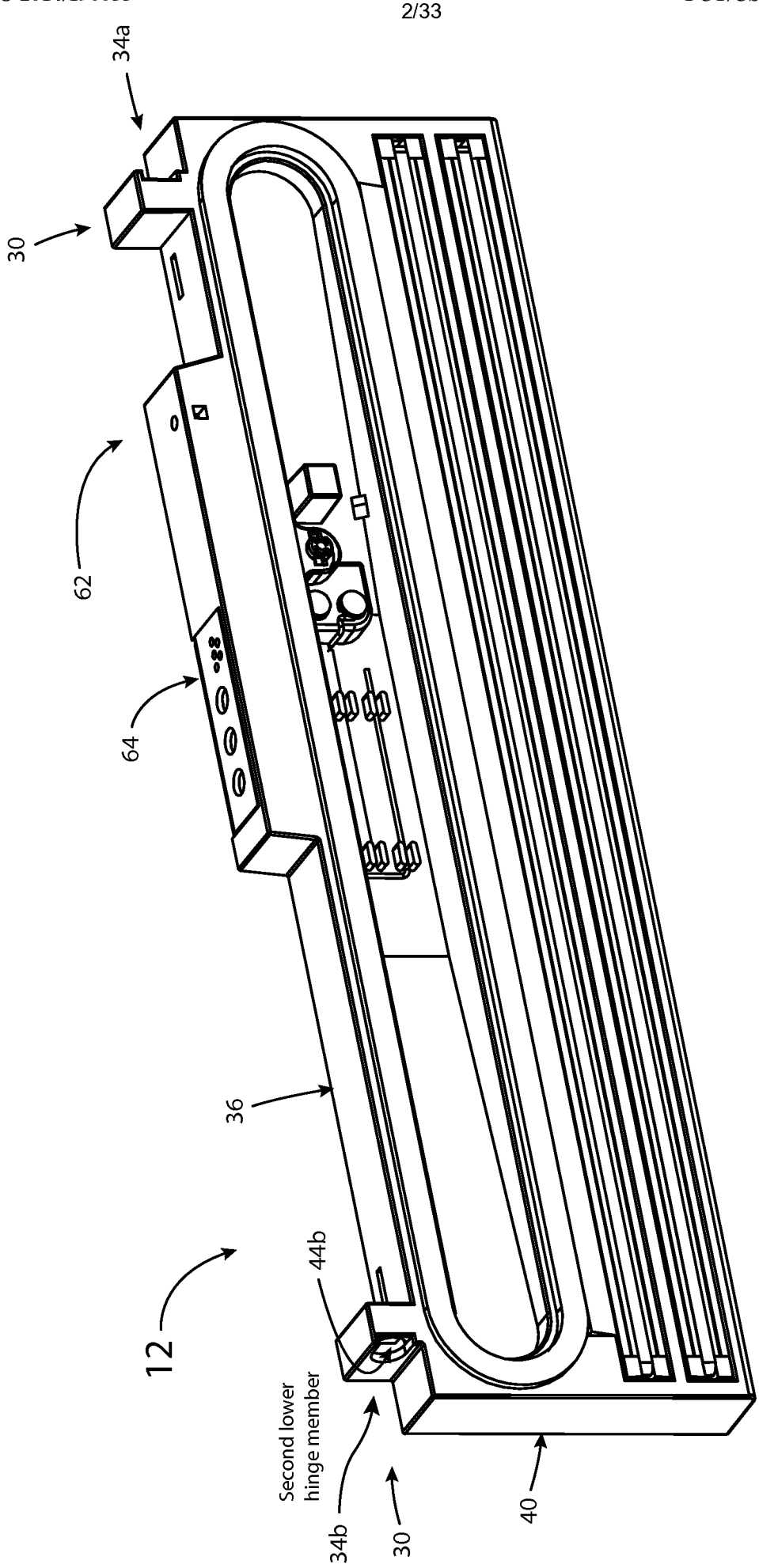


Figure 2

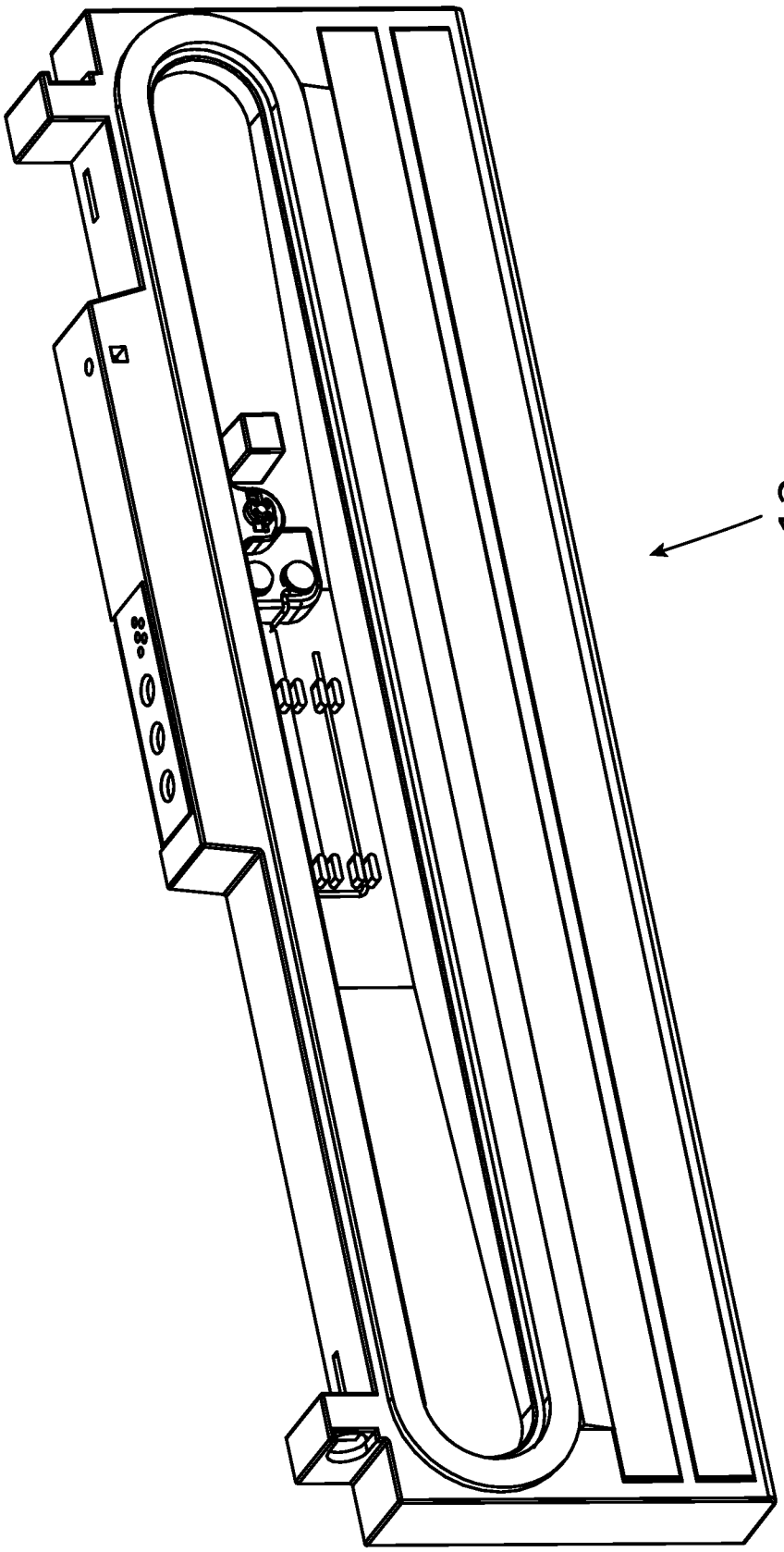


Figure 3

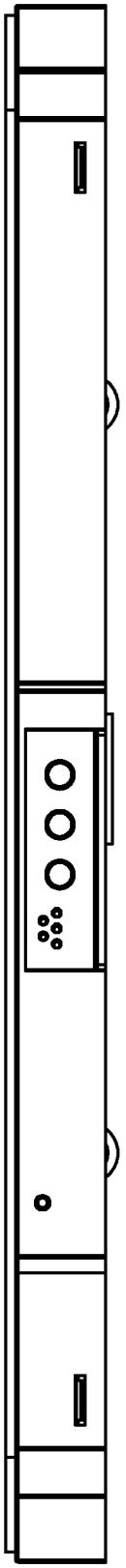


Figure 4

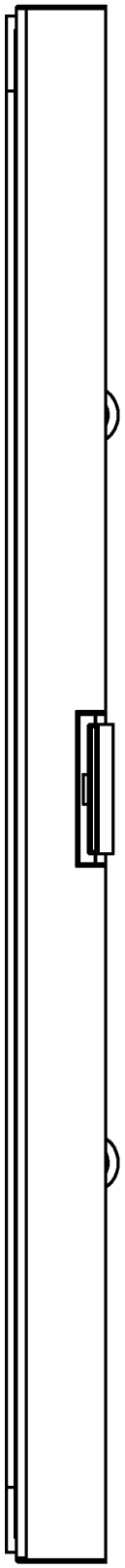


Figure 5

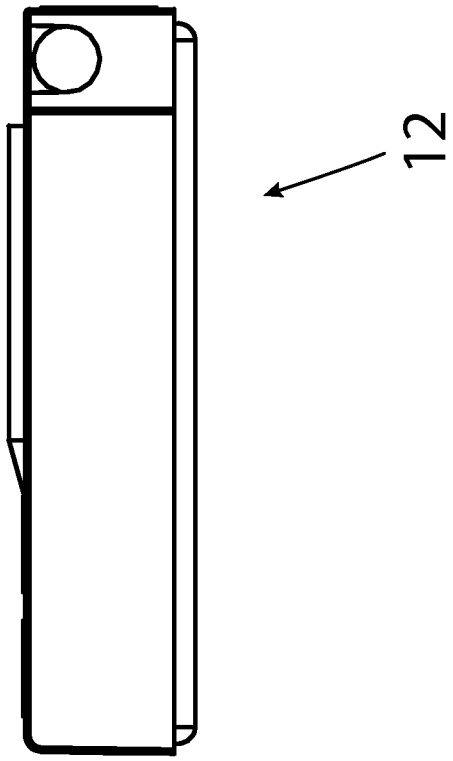


Figure 6

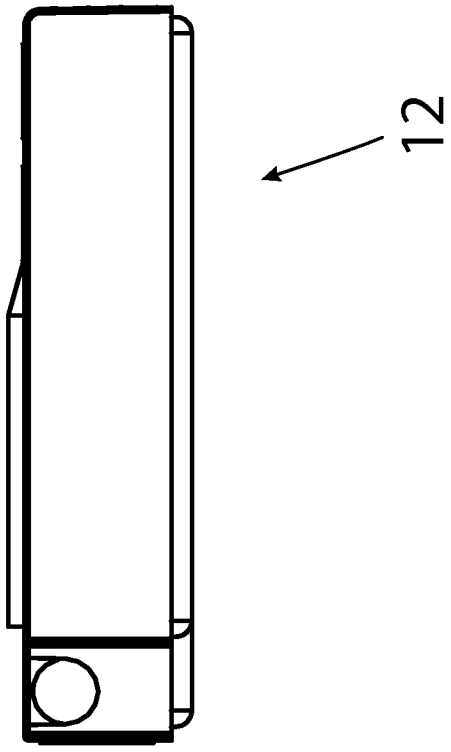


Figure 7

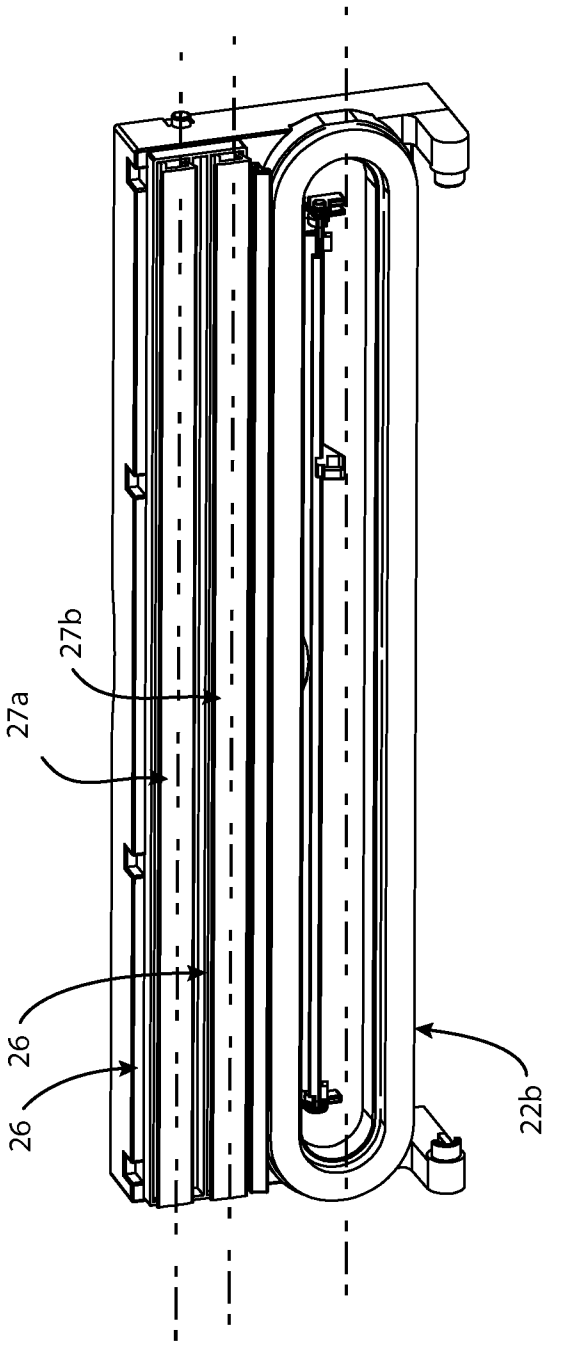


Figure 8

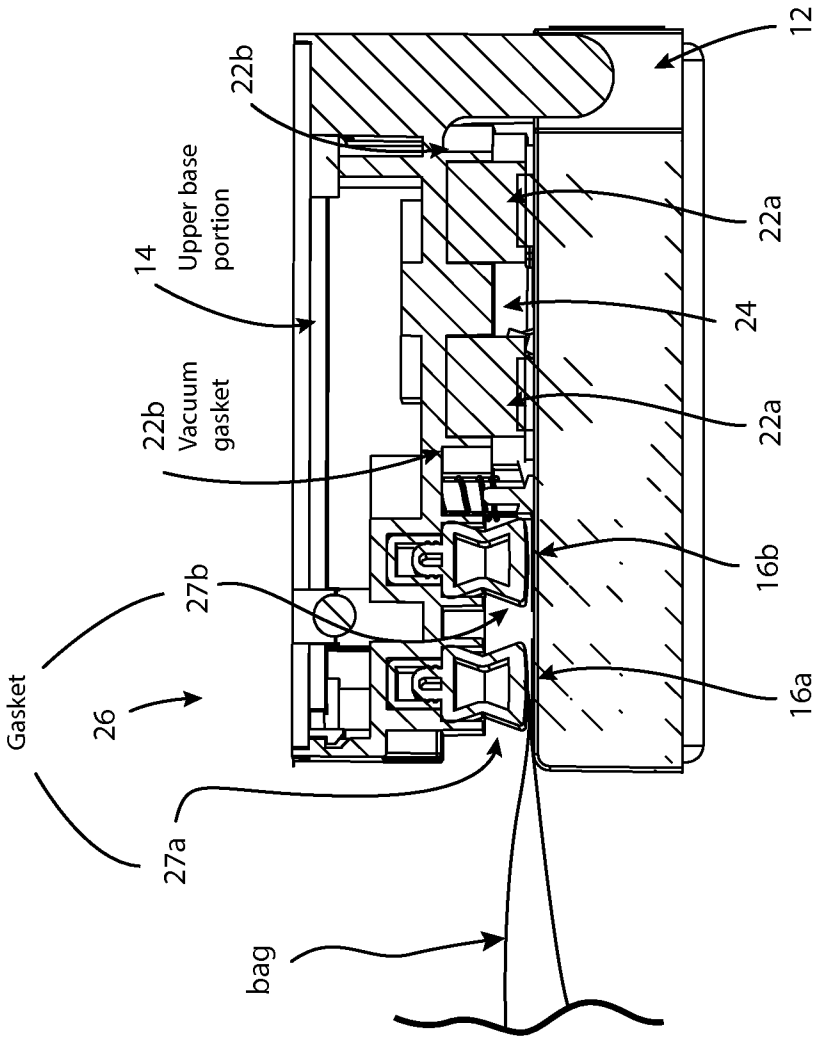

12
22b
Upper base portion
14
22a
24
22a
22b
Vacuum gasket
16b
27b
Gasket
26
16a
27a
bag

Figure 9

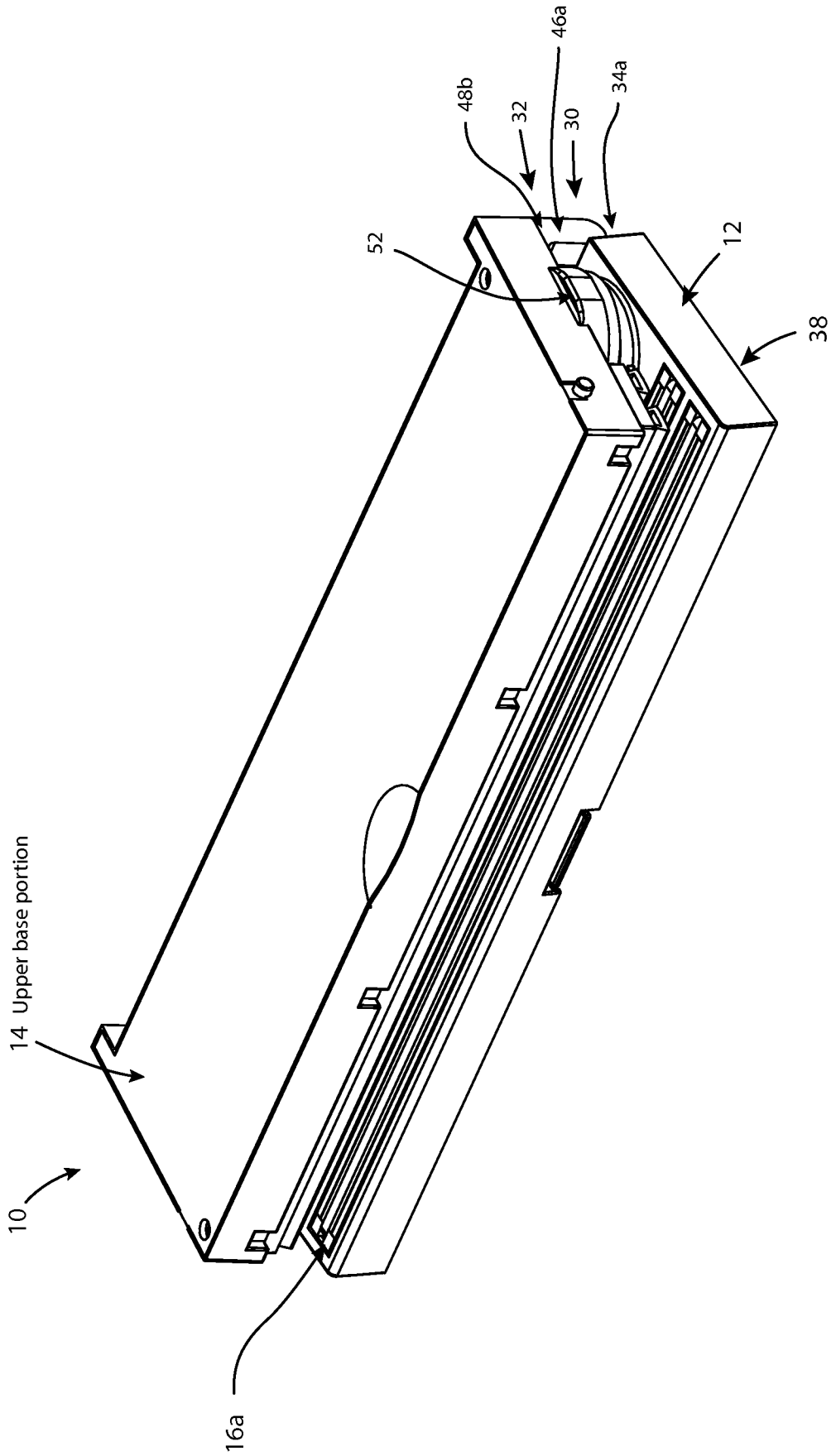


Figure 10

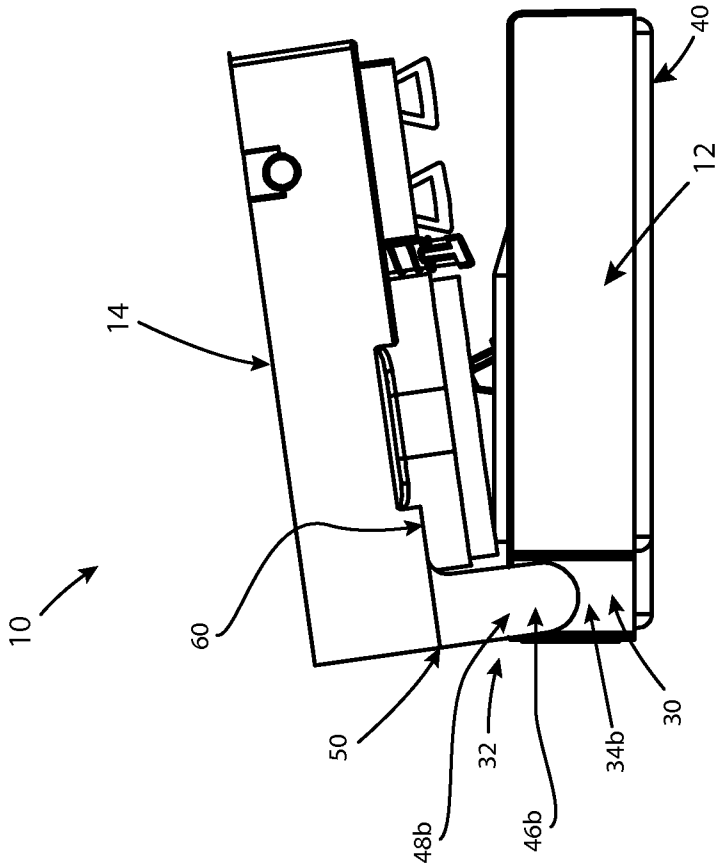


Figure 11

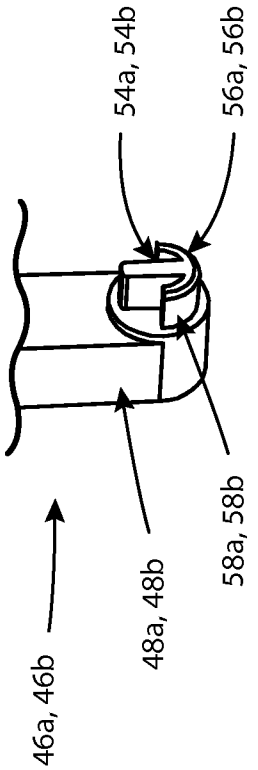


Figure 13

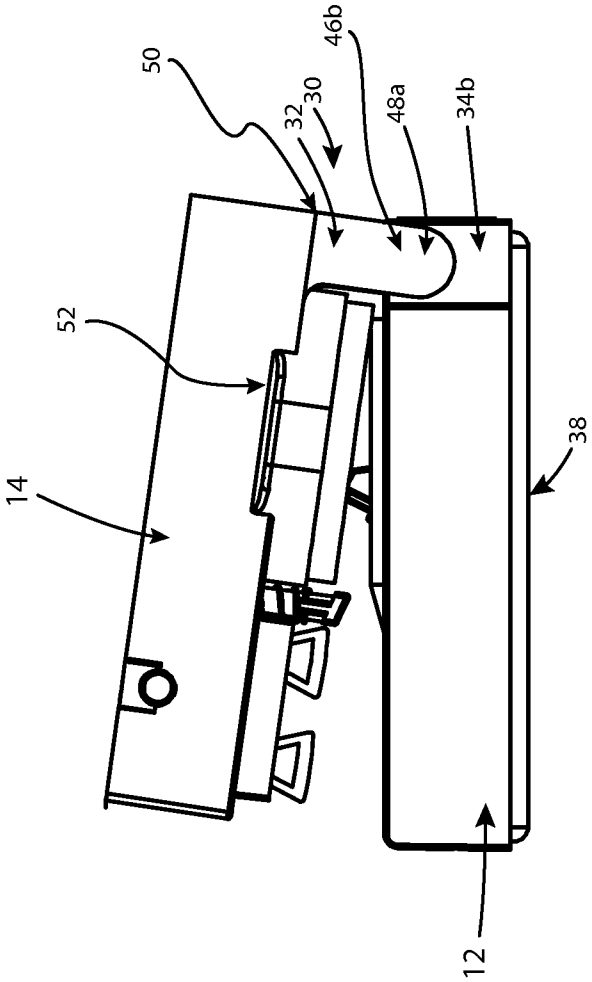


Figure 12

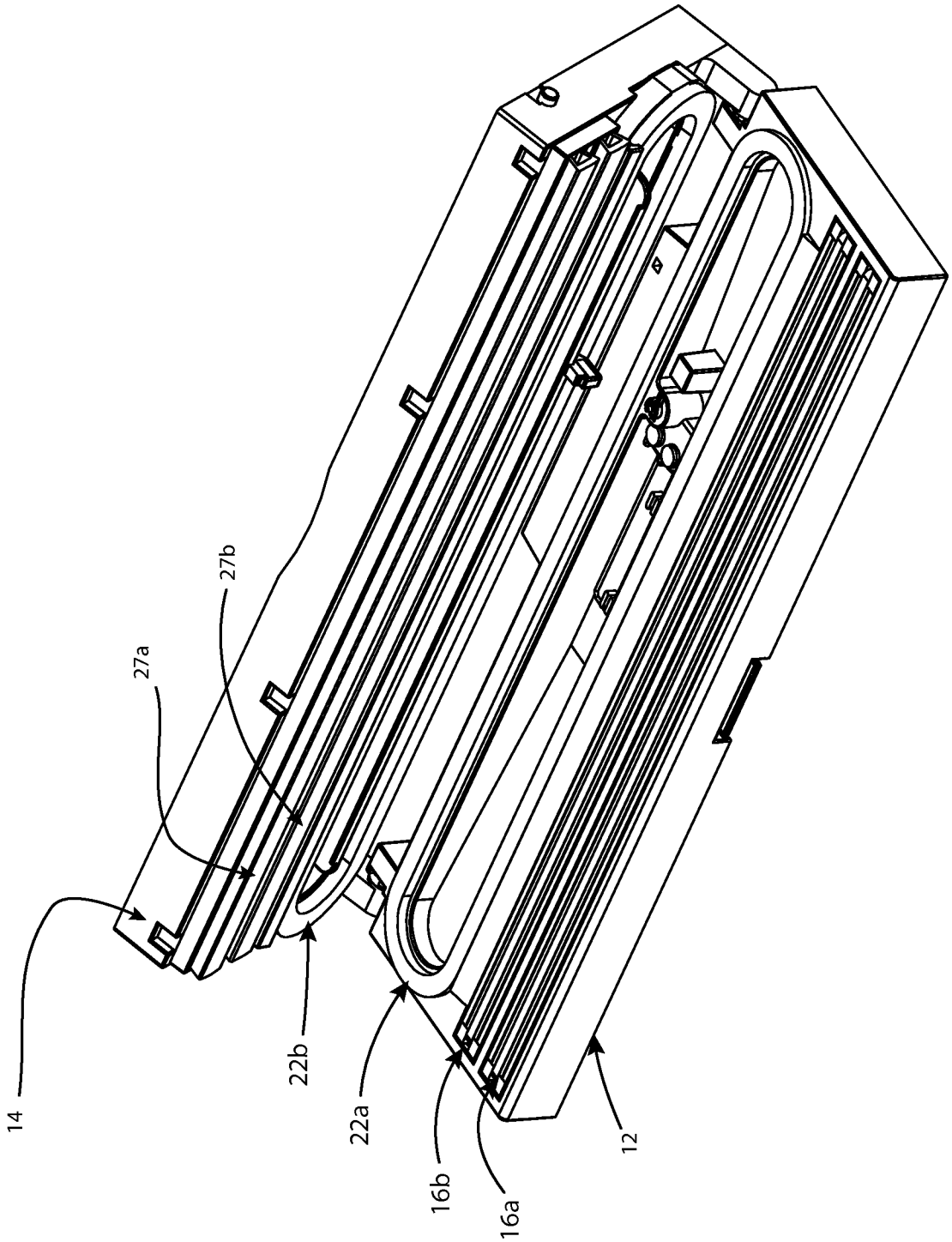
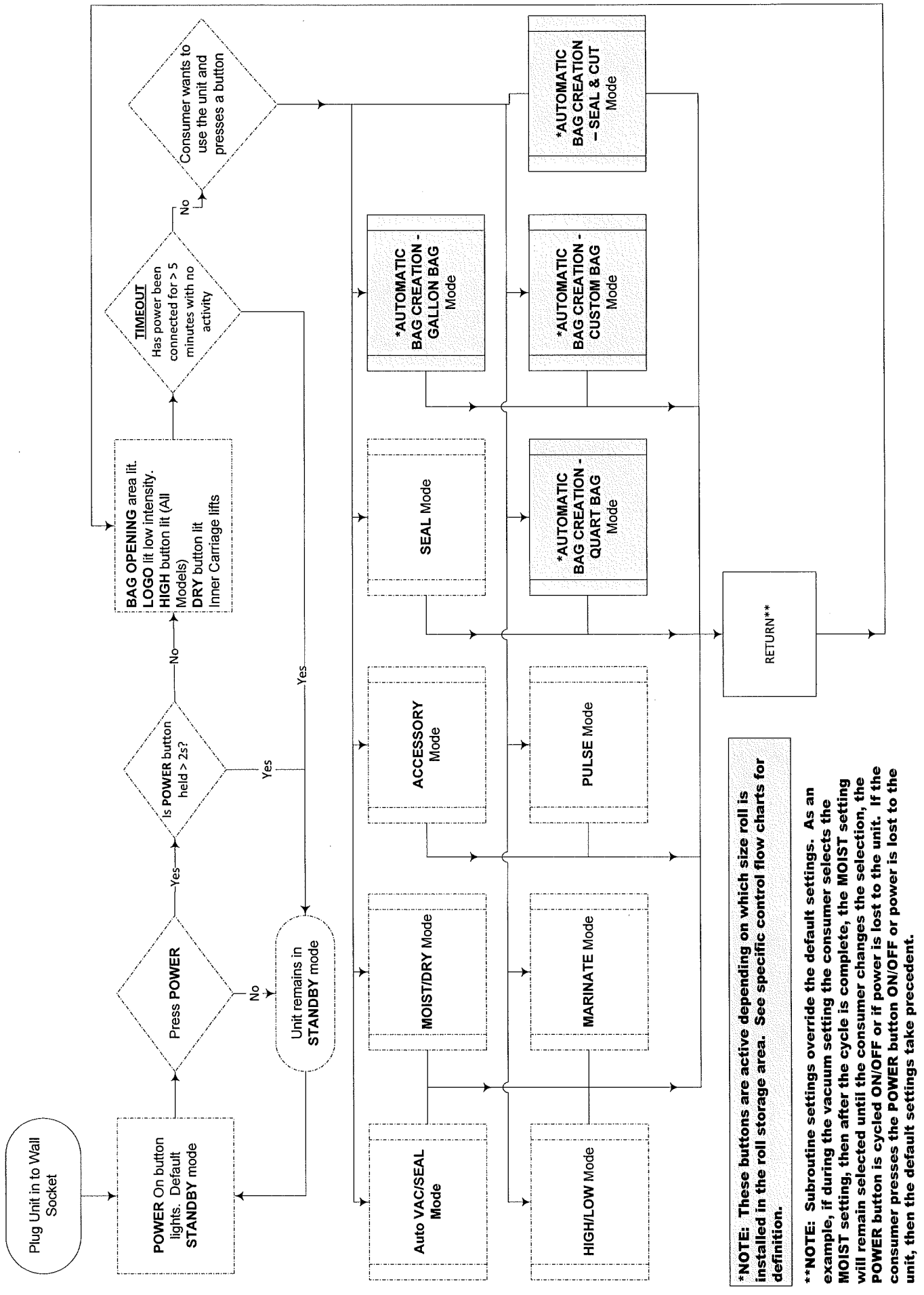


Figure 14

FIGURE 15


Primary Control Function Flow
Plug Unit in to Wall Socket
POWER On button lights. Default STANDBY mode
Press POWER
No
Unit remains in STANDBY mode
Yes
Is POWER button held > 2s?
Yes
No
BAG OPENING area lit.
LOGO lit low intensity.
HIGH button lit (All Models)
DRY button lit
Inner Carriage lifts
TIMEOUT
Has power been connected for > 5 minutes with no activity
No
Consumer wants to use the unit and presses a button
Auto VAC/SEAL Mode
MOIST/DRY Mode
ACCESSORY Mode
SEAL Mode
*AUTOMATIC BAG CREATION - GALLON BAG Mode
HIGH/LOW Mode
MARINATE Mode
PULSE Mode
*AUTOMATIC BAG CREATION - QUART BAG Mode
*AUTOMATIC BAG CREATION - CUSTOM BAG Mode
*AUTOMATIC BAG CREATION – SEAL & CUT Mode
RETURN**
*NOTE: These buttons are active depending on which size roll is installed in the roll storage area. See specific control flow charts for definition.
**NOTE: Subroutine settings override the default settings. As an example, if during the vacuum setting the consumer selects the MOIST setting, then after the cycle is complete, the MOIST setting will remain selected until the consumer changes the selection, the POWER button is cycled ON/OFF or if power is lost to the unit. If the consumer presses the POWER button ON/OFF or power is lost to the unit, then the default settings take precedent.

AUTOMATIC BAG CREATION Control Function Flow

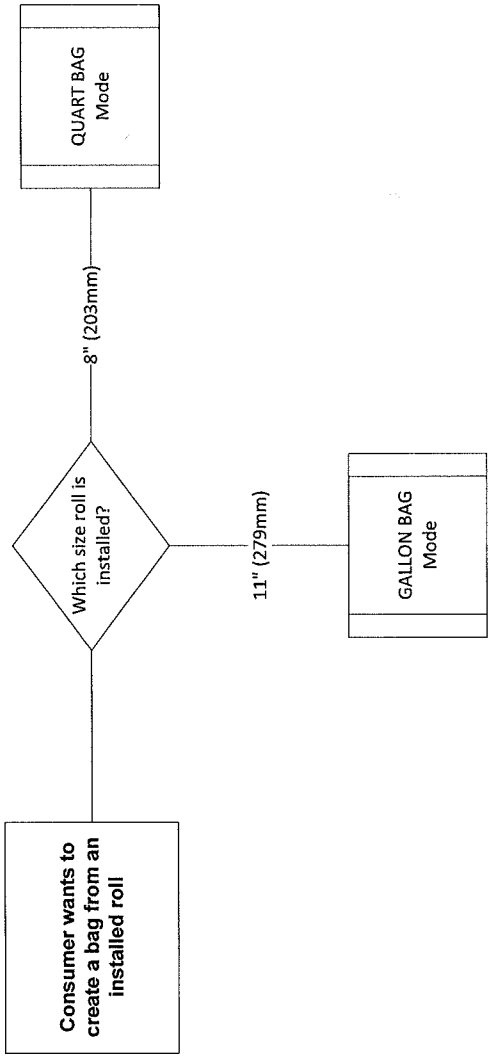


FIGURE 16

AUTOMATIC BAG CREATION – QUART BAG Control Function Flow

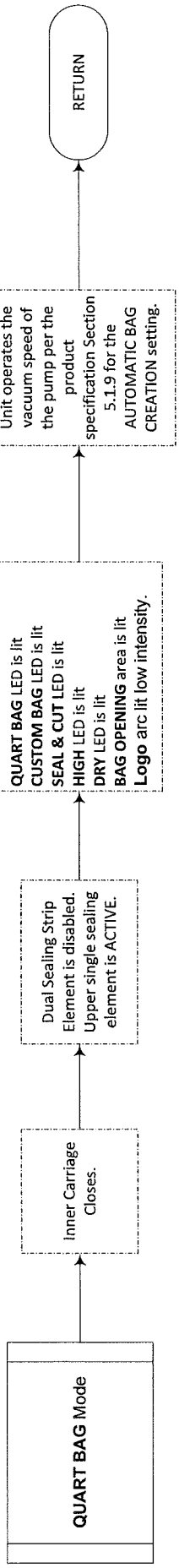


FIGURE 17

AUTOMATIC BAG CREATION – GALLON BAG Control Function Flow

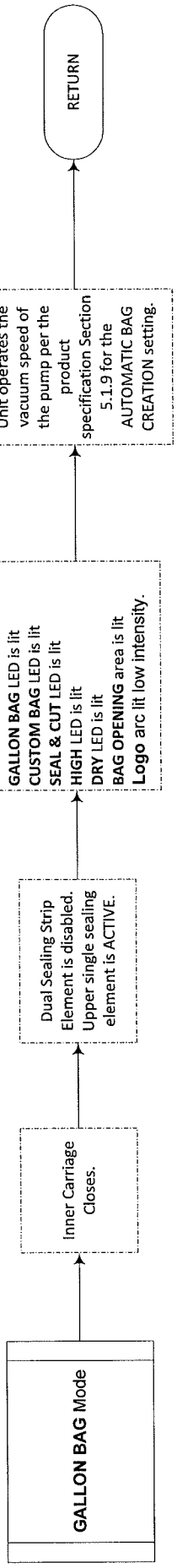


FIGURE 18

AUTOMATIC BAG CREATION – CUSTOM BAG Control Function Flow

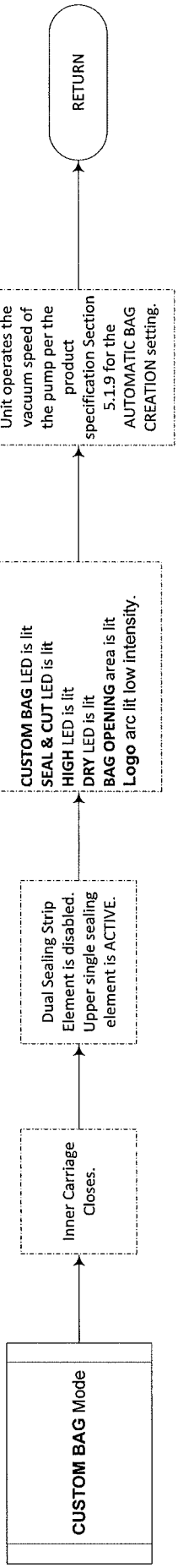
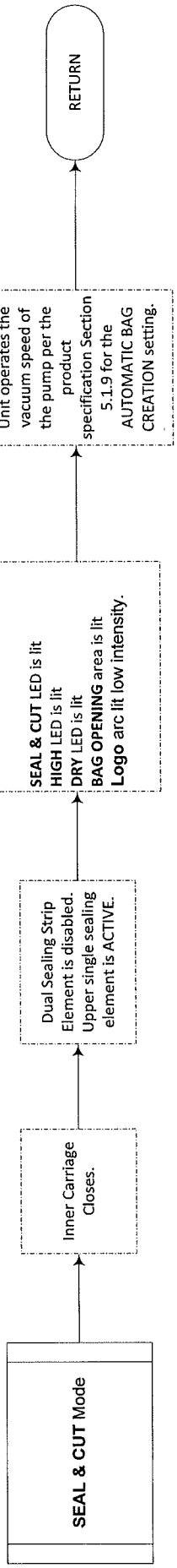


FIGURE 19

AUTOMATIC BAG CREATION – SEAL & CUT Control Function Flow



FIGRUE 20

Figure 21

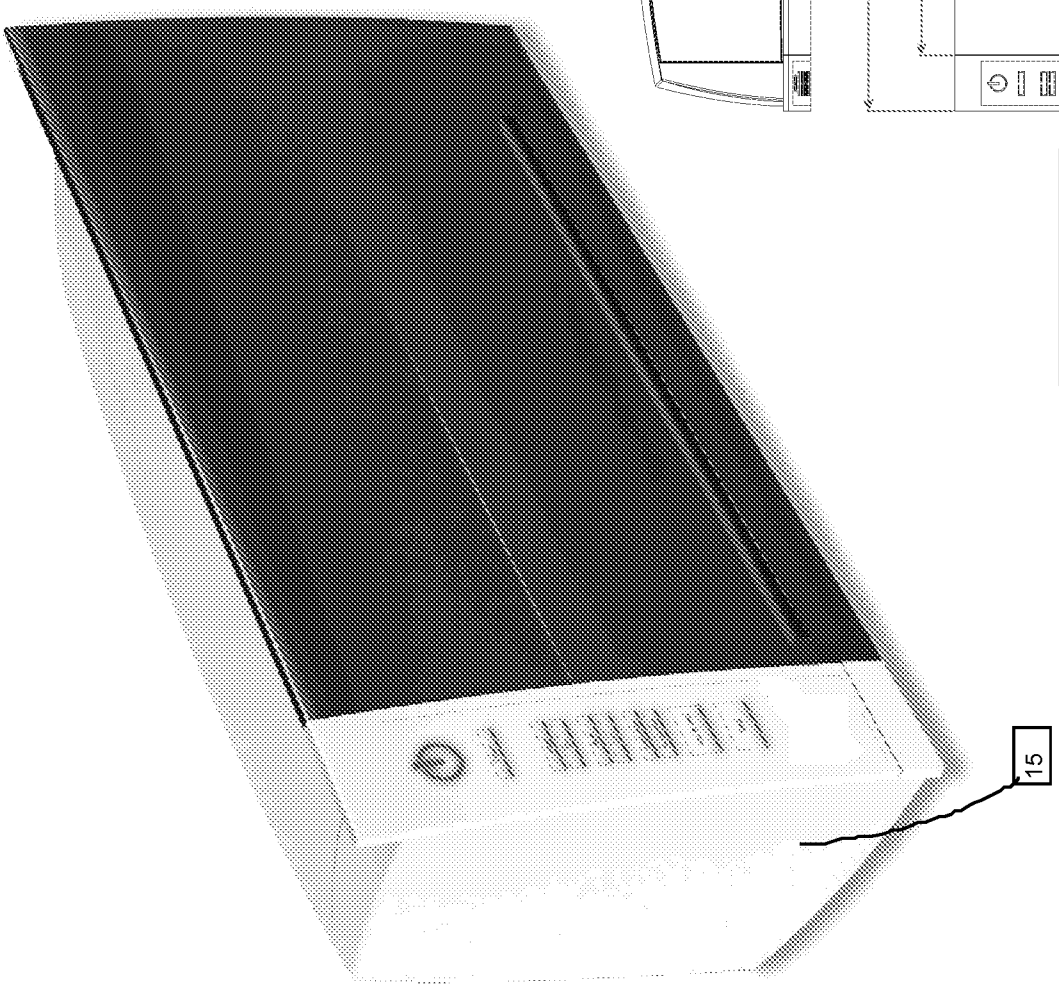


Figure 22A

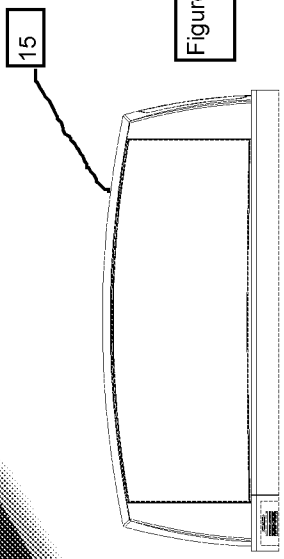


Figure 22B

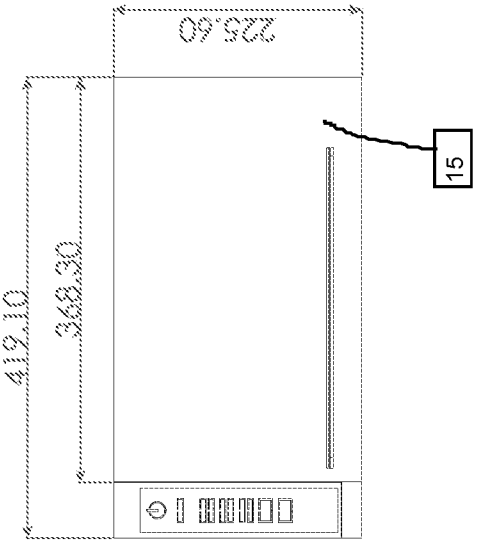
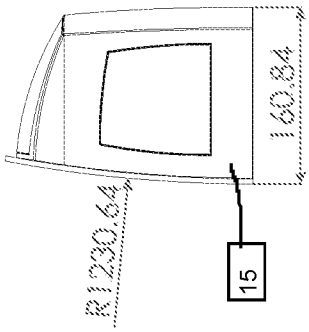


Figure 22C



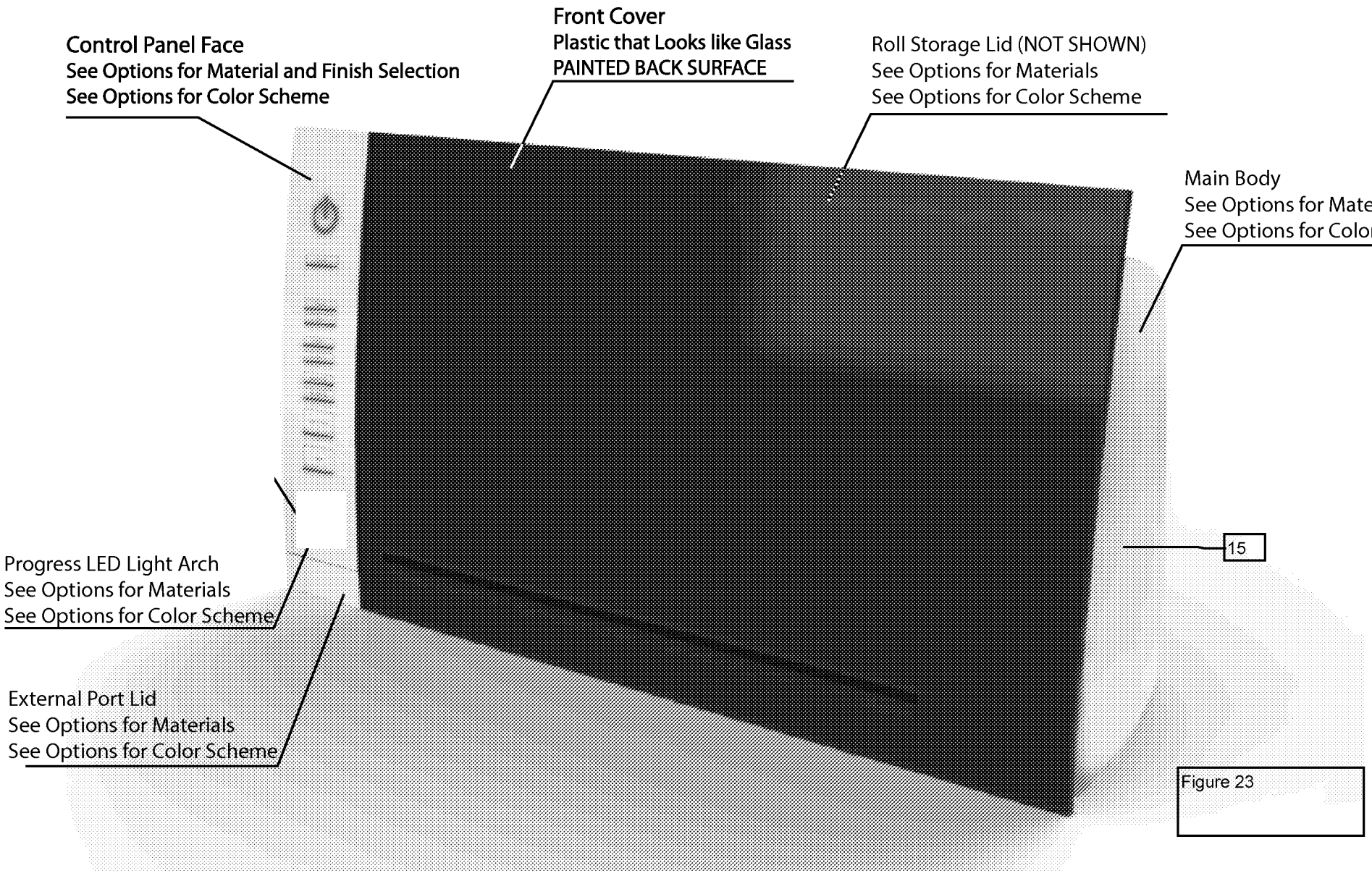

Control Panel Face
See Options for Material and Finish Selection
See Options for Color Scheme
Front Cover
Plastic that Looks like Glass
PAINTED BACK SURFACE
Roll Storage Lid (NOT SHOWN)
See Options for Materials
See Options for Color Scheme
Main Body
See Options for Materials
See Options for Color Scheme
15
Progress LED Light Arch
See Options for Materials
See Options for Color Scheme
External Port Lid
See Options for Materials
See Options for Color Scheme

Figure 23

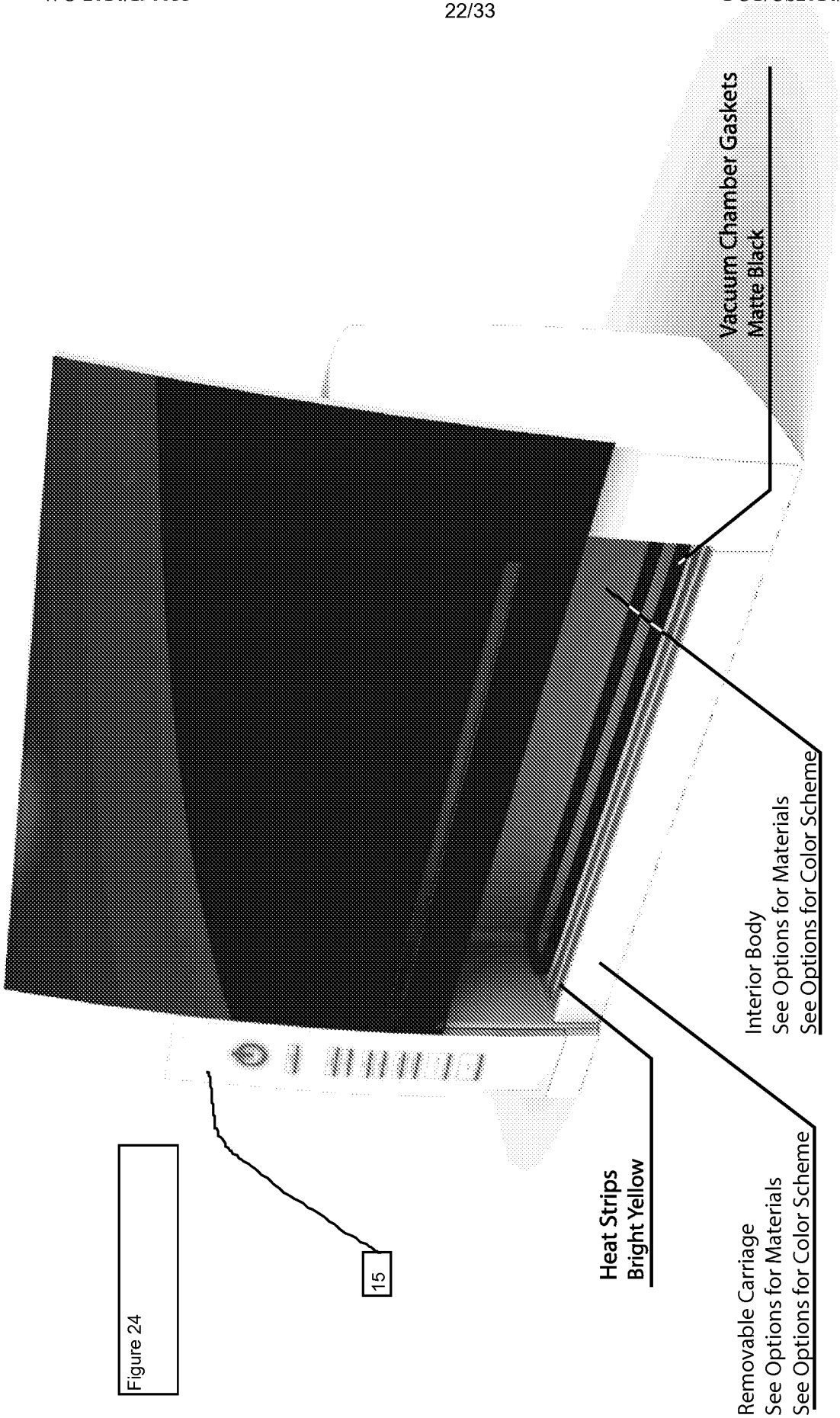

Vacuum Chamber Gaskets
Matte Black
Interior Body
See Options for Materials
See Options for Color Scheme
Heat Strips
Bright Yellow
Removable Carriage
See Options for Materials
See Options for Color Scheme
15

Figure 24

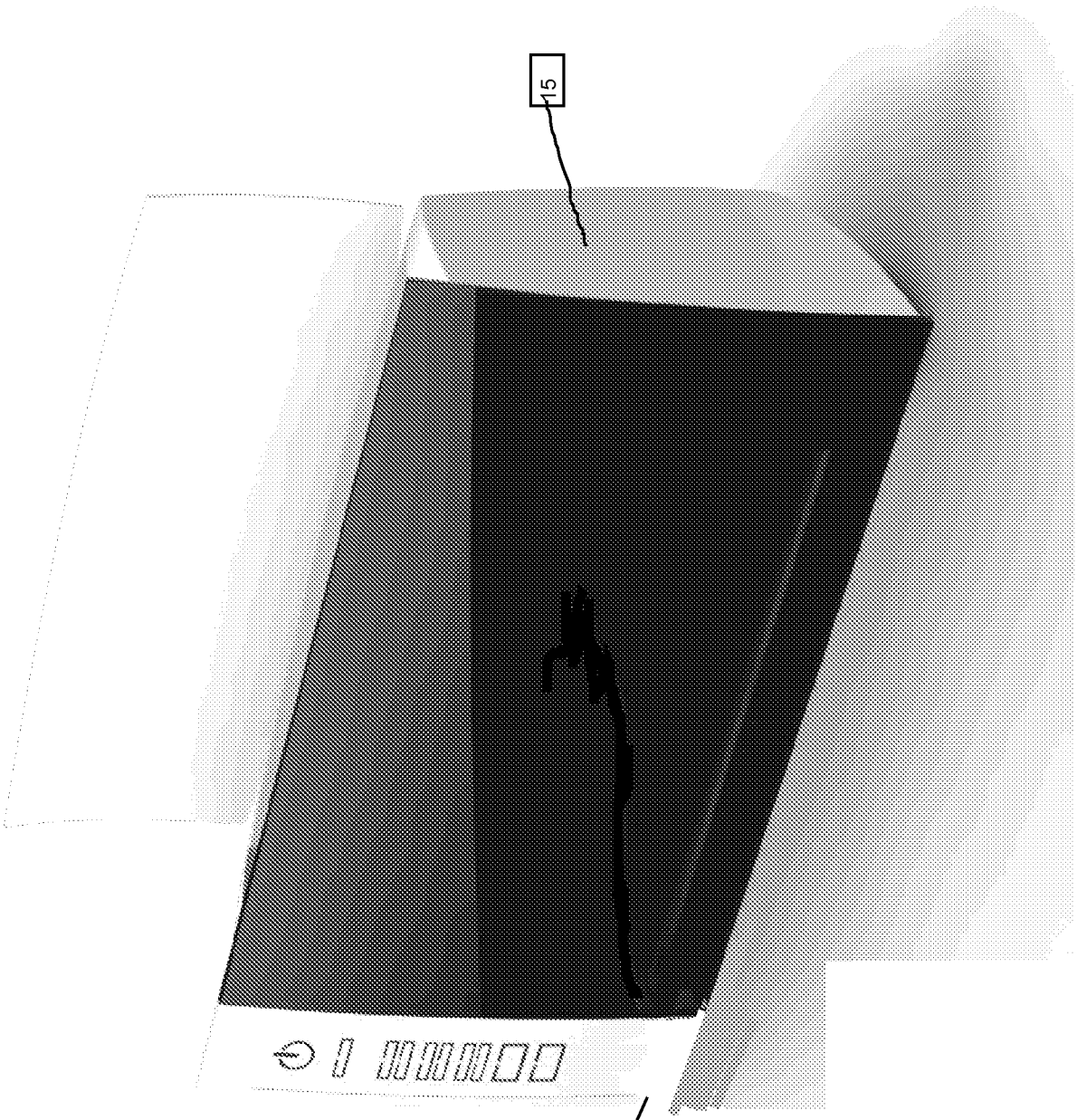

15
External Port Cover
See Options for Materials
See Options for Color Scheme

Figure 25

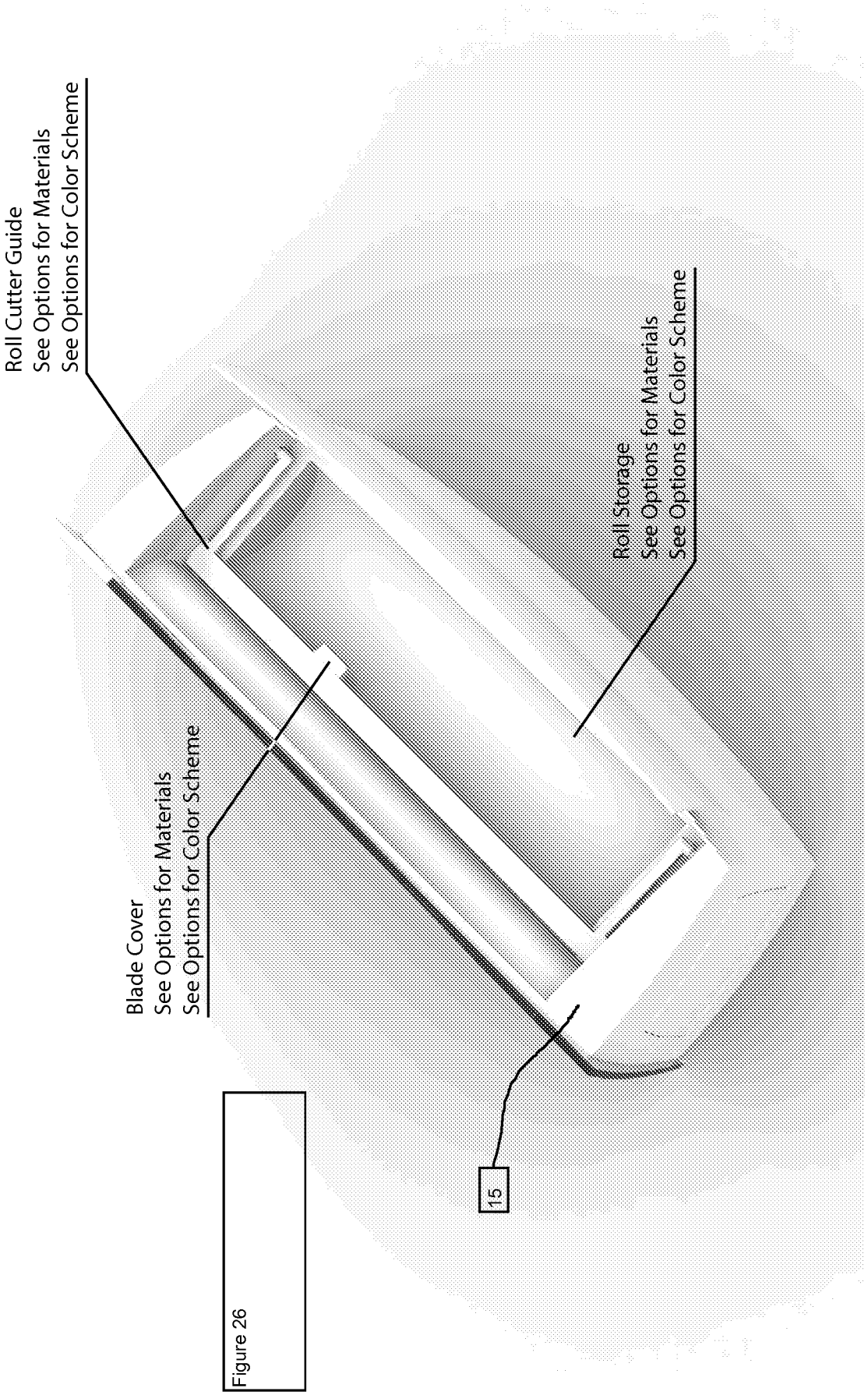

Roll Cutter Guide
See Options for Materials
See Options for Color Scheme
Blade Cover
See Options for Materials
See Options for Color Scheme
Roll Storage
See Options for Materials
See Options for Color Scheme
15

Figure 26

Figure 27A

Figure 27B

Figure 28A

Figure 28B

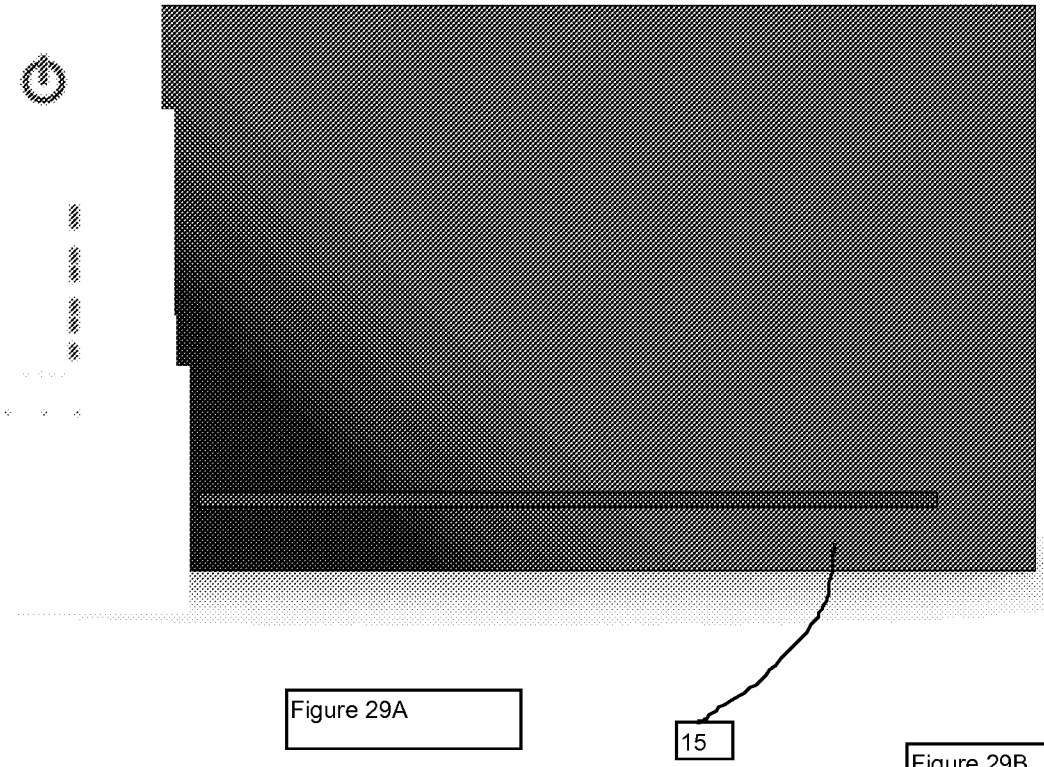
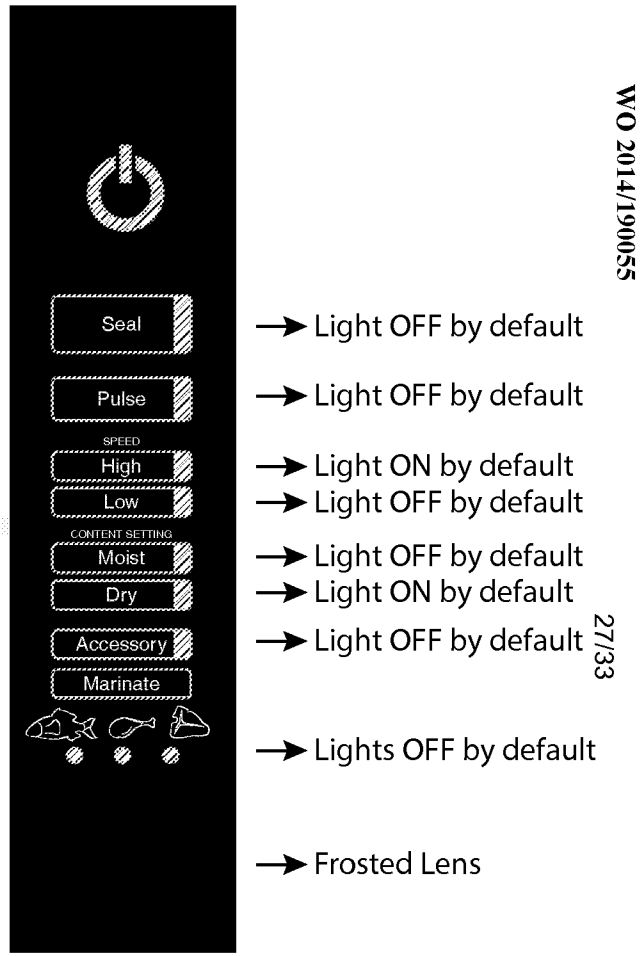


Figure 29A

15

Figure 29B



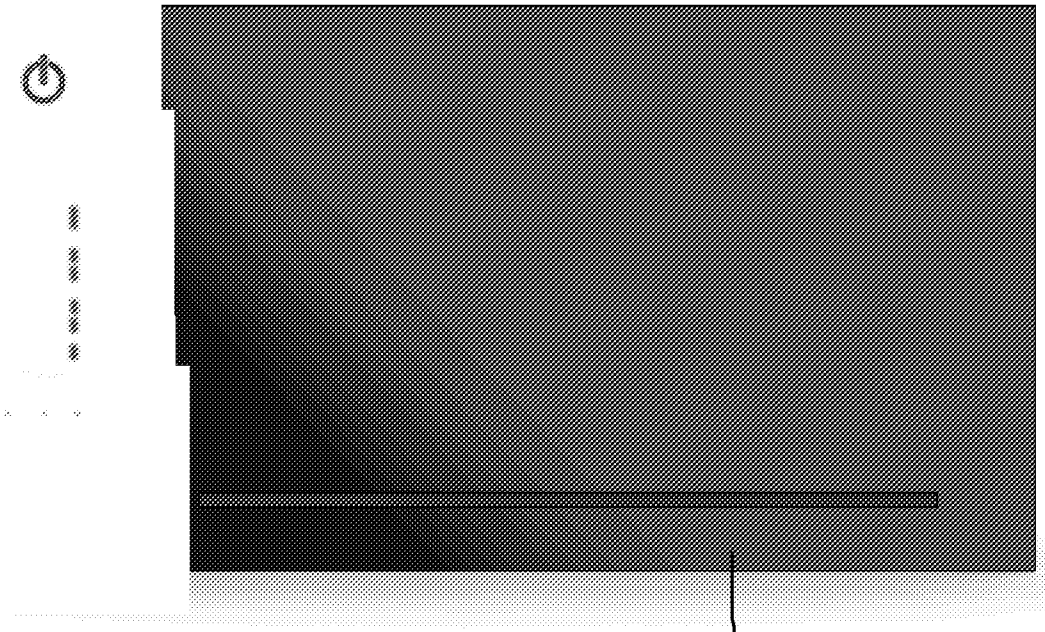
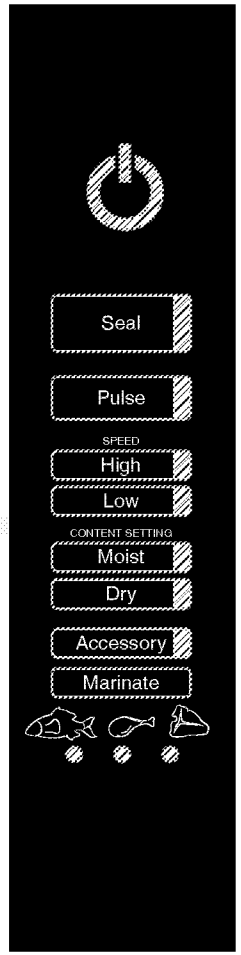


Figure 30A

15

Control Panel



→ Light OFF by default
→ Light OFF by default
→ Light ON by default
→ Light OFF by default
→ Light OFF by default
→ Light ON by default
→ Light OFF by default
→ Lights OFF by default
→ Frosted Lens

Figure 30B

Figure 31A

Figure 31B

Figure 32B

Figure 32A

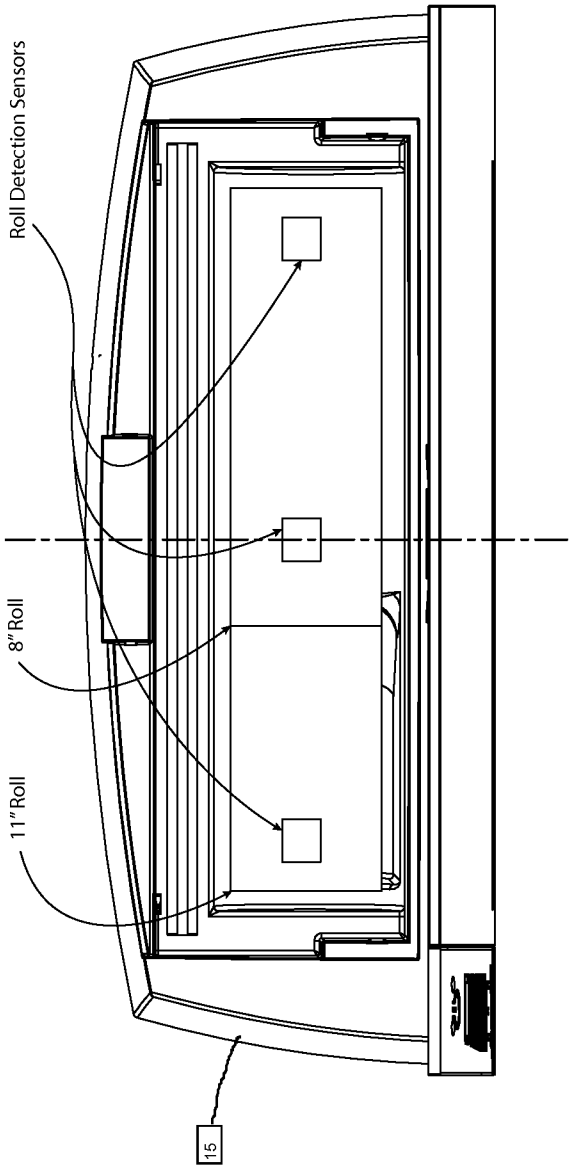


Figure 33

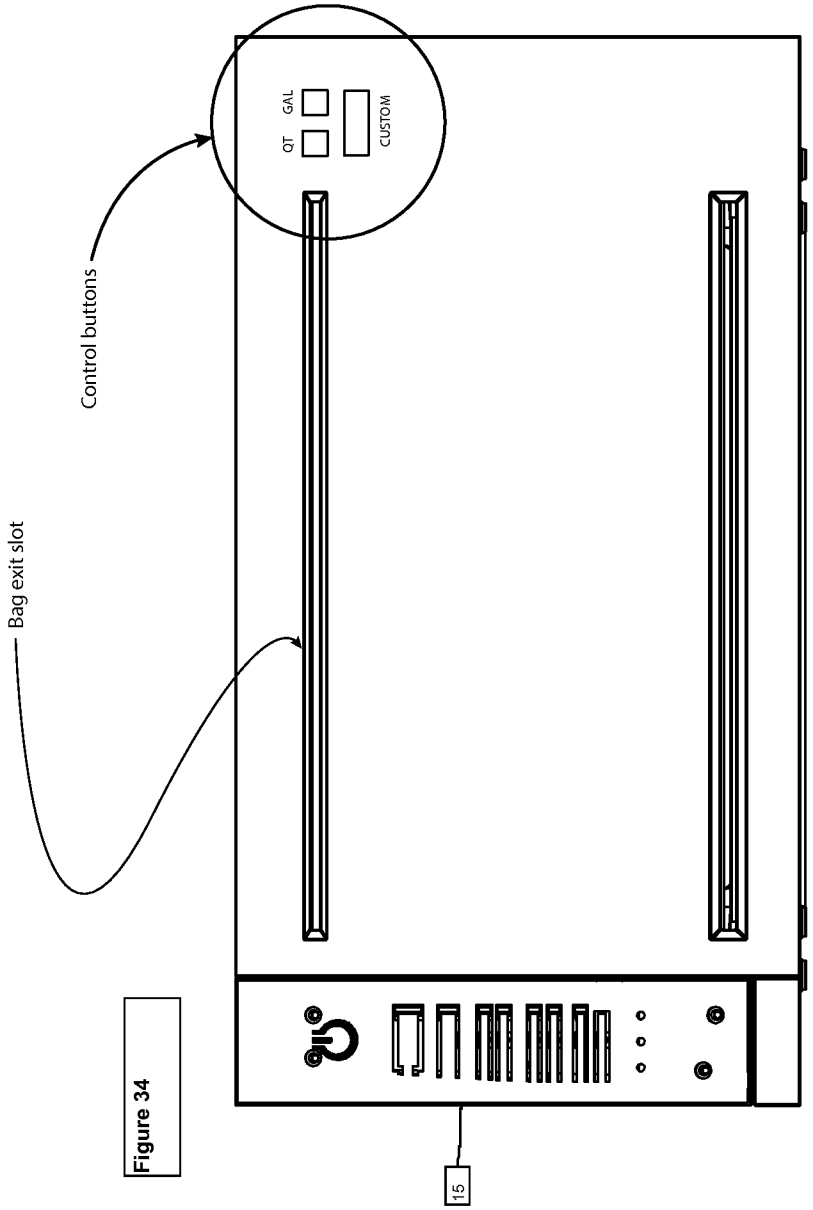


Figure 34

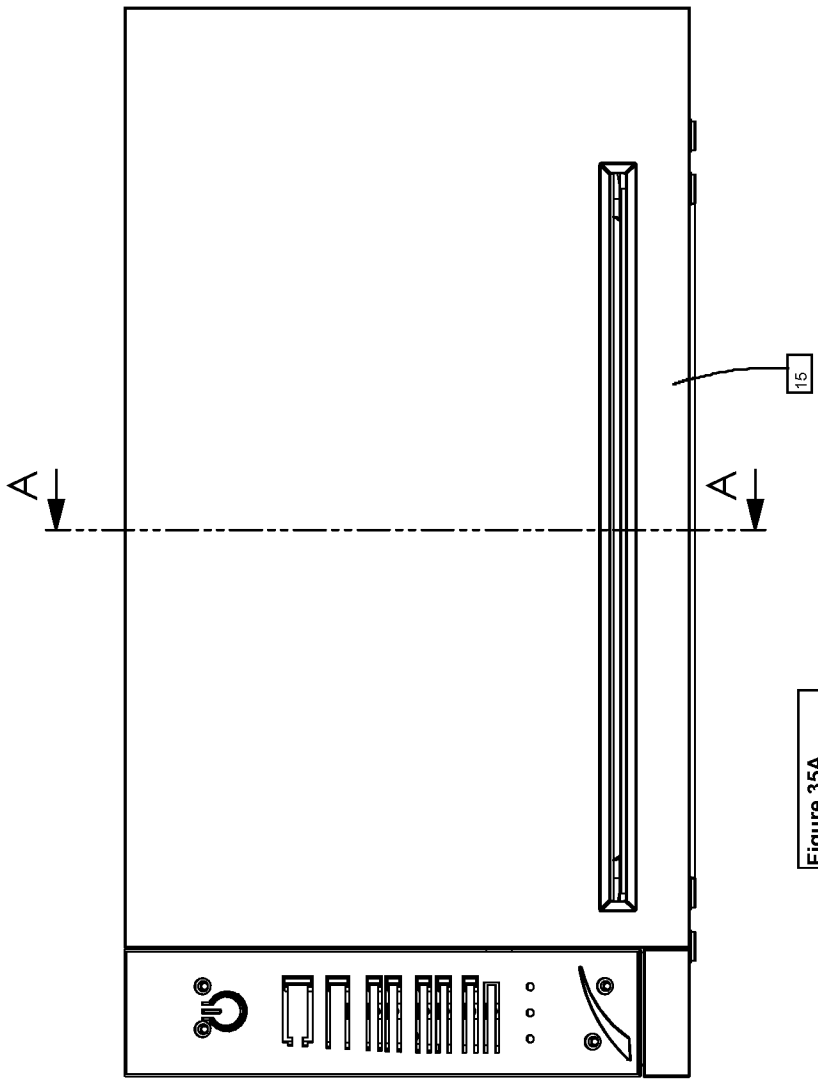


Figure 35A

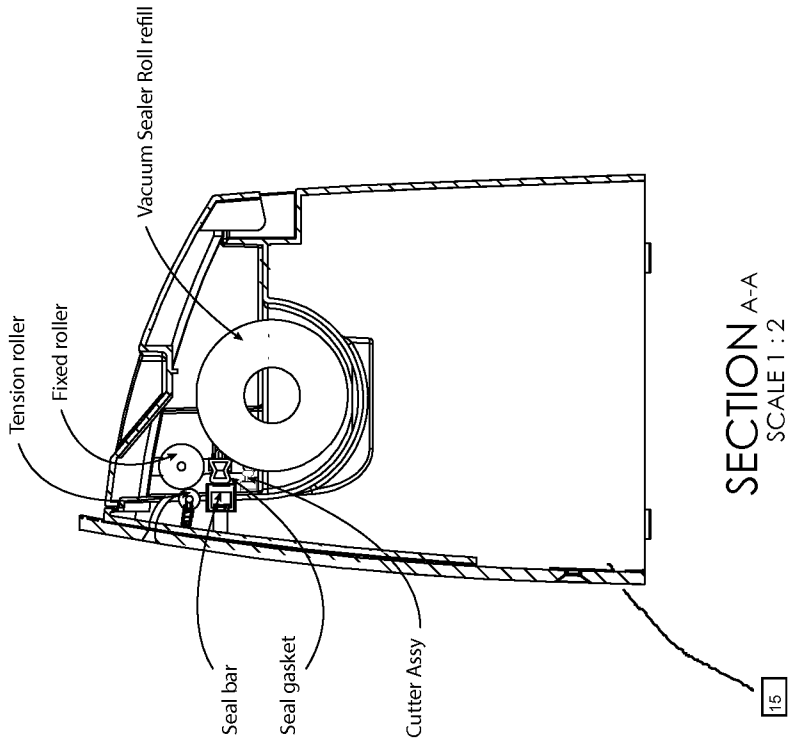


Figure 35B