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(54) BOWLING BALL STOP ASSEMBLY

(57) A bowling ball stop assembly for a pinsetter of a bowling lane is provided. The bowling ball stop assembly can include a moveable blocking feature that moves between a plurality of positions. The plurality of positions include an extended position with the stop arranged in front of the pinsetter to block or obstruct bowling balls moving down the bowling lane, and a retracted position with the stop raised away from the bowling lane to allow passage of bowling balls and the play of bowling games thereon. The bowling ball stop assembly further includes a frame supporting the blocking feature and configured to guide or facilitate control of movement thereof between the extended and retracted positions. Other aspects also are described.

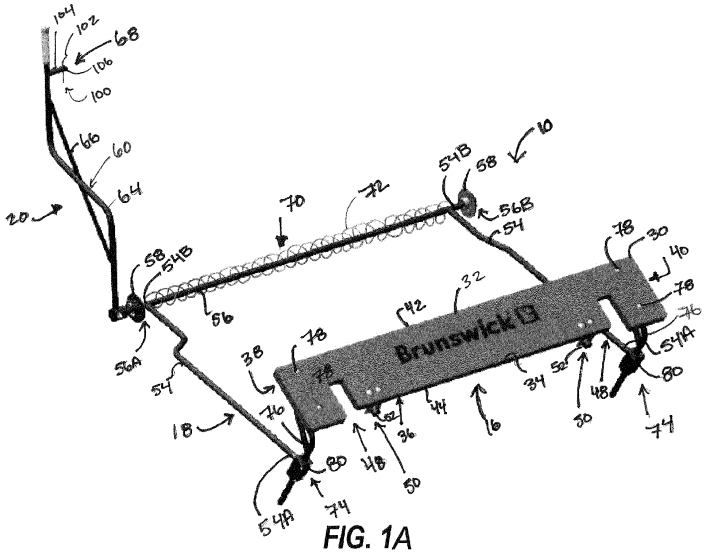

FIG. 1A

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Description

Cross-Reference to Related Application

[0001] The present application claims the benefit of U.S. Provisional Patent Application No. 62/656,025, which was filed April 11, 2018. U.S. Provisional Patent Application No. 62/656,025, which was filed April 11, 2018, is hereby incorporated by reference for all purposes as if presented herein its entirety.

Technical Field

[0002] The present disclosure is directed to bowling, and more specifically, to a bowling ball stop assembly for a bowling lane.

Background

[0003] When performing maintenance on and/or servicing the operative components of a bowling lane, such as servicing a bowling lane pinsetter assembly, bowling center personal may be exposed to bowling balls rolled, intentionally or unintentionally, down the bowling lane. To prevent serious injury to such bowling personnel and/or damage to the operative components of the bowling lane (e.g., exposed components of the pinsetter), bowling personnel typically have had to manually carry and place a large board down along the bowling lane being serviced to obstruct/block any bowling balls that may be rolled down the lane. Such boards or barriers, however, are generally heavy and can be difficult to carry and set up, often having to be attached to the bowling lane with temporary supports and/or devices, such as suction cups, making them susceptible to falling over and/or failing to stop fast moving bowling balls rolled down the lane. Accordingly, it can be seen that a need exists for a bowling ball stop assembly that is easily deployable and provides protection during maintenance/servicing of a bowling lane, and which addresses other related and unrelated issues in the art.

Summary

[0004] Briefly described, the present disclosure is, in one aspect, directed to a bowling ball stop assembly that is easily/readily deployable adjacent a service area of a bowling lane to stop/block bowling balls, for example, rolled down a bowling lane during maintenance/servicing thereof.

[0005] The deployable ball stop assembly can be connected to a pinsetter assembly for the bowling lane and generally includes a moveable or setable blocking feature that can be moved between a plurality of positions, including an extended position with the blocking feature arranged in front of the pinsetter assembly in a position to block bowling balls rolled down the bowling lane, and a retracted position with the blocking feature raised away, retracted, or otherwise moved from the bowling lane to allow passage of bowling balls and play of bowling games on the bowling lane. When in its extended position, the blocking feature generally will be spaced in front of and/or will define a secured area of a size sufficient to enable workers to service the pinsetter assembly and/or other features or operative elements of the lane, etc., while being protected from bowling balls coming down the lane.

[0006] The blocking feature can include at least one blocking or stop element, such as a board or panel. The stop can be formed from a heavy-duty, substantially impact-resistant material, such as plywood. However, other suitable durable, substantially impact-resistant materials sufficient to withstand the impact of and stop bowling balls also can be used without departing from the scope of the present disclosure.

[0007] The stop generally will be sized, dimensioned, or configured to extend across the bowling lane, with a height sufficient to block/stop a bowling ball and resist the ball rolling or bouncing over the stop after impact. The stop further may be configured with side portions that at least partially extend into the gutters of the bowling lane, for example, to obstruct/stop bowling balls rolled down or diverted into the gutter from passing into the secured area defined by the stop. The stop also may have one or more recesses or cutout portions defined therealong, which can be provided to allow the stop to be deployed to its extended position while bowling lane bumpers are activated, *i.e.,* are in an raised configuration/orientation, or with other obstructions within the gutters or lanes.

[0008] The stop further can include one or more cushioning members attached thereto. For example, the cushioning members can be located along a bottom edge of the stop or otherwise positioned to allow the stop to at least partially engage/rest on the bowling lane surface without scratching, scuffing, or otherwise causing damaging thereto. In one embodiment, the cushioning members can include rubber cushions or pads arranged along a bottom portion of the stop or one or more of the supports therefor. Other cushioning members or mechanisms suitable for preventing damage to the bowling lane surface, when the stop is deployed in its extended position onto the lane, also can be used without departing from the scope of the present disclosure.

[0009] Additionally, the deployable bowling ball stop assembly can include a movable frame attached to the stop. The frame can be rotatably, pivotably, or otherwise movably attached to at least a portion of the pinsetter assembly for the bowling lane, and will be operable to control movement of the stop between the extended and retracted positions.

[0010] The rotatable frame can have a handle or lever attached thereto that can be actuated or otherwise engaged to move the stop between its retracted and extended positions. The handle/lever can be ergonomically shaped to facilitate raising and lowering of the stop. The handle also can have a body shaped or configured to

avoid contact or engagement with the parts/components of the pinsetter assembly as the handle is moved to raise and lower the stop.

[0011] The handle additionally can have one or more locking features attached thereto for locking or otherwise securing the stop in its retracted and/or extended positions. In one embodiment, the locking feature(s) can include a pin assembly, and in an alternative construction the locking feature(s) can include a latch assembly, though any suitable locking features, mechanisms, etc., can be used without departing from the scope of the present disclosure.

[0012] The frame also can include a plurality of support arms, rods, shafts, or other suitable supporting members connected to the stop, including a set of spaced supports or support arms located on opposite sides of the frame, and a center shaft or cross-wise support that extends between and connects the support arms. The stop can be connected to distal ends of the support arms, and the center shaft further generally will be rotatably coupled to a portion of the pinsetter assembly, such as by one or more bushings, bearing assemblies and/or other members/mechanisms that facilitate rotation of the center shaft/cross-wise support.

[0013] A distal end of the handle can be coupled to one end of the cross-wise support so that movement of the handle will cause rotation of the cross-wise support. Such rotation of the cross-wise support in turn causes the support arms to extend or retract to thus move the stop between its retracted and extended positions. The present disclosure is not limited to this arrangement or construction, however, and movement of the frame may be driven and/or controlled by one or more drive mechanisms or assemblies, e.g., motors, actuators, etc., without departing from the scope of the present disclosure.

[0014] The rotatable frame further can be counterbalanced to facilitate raising and lowering of the stop. In one embodiment, the frame can include one or more biasing members arranged therealong that can provide biased assistance as the stop is raised towards its retracted position and resistance as the stop is lowered to its extended position, for example, to prevent the stop from forcefully engaging and/or damaging the bowling lane surface.

[0015] The biasing member(s) for assisting in raising and lowering of the blocking feature can be at least partially received about or otherwise be in communication with the center shaft/cross-wise support. In one embodiment, the biasing member(s) can include one or more torsion springs received along and extending about the cross-wise support, and coupled thereto to apply a biasing/torsion force to the center shaft as it rotates. In an additional or alternative construction or variation, a biasing member, such as a tension spring with opposing hooped or looped ends, can be coupled/connected to at least a portion of the handle and at least a portion of the pin setter or other component/member attached thereto. Other suitable springs and/or biasing members also can be employed without departing from the scope of the present disclosure.

[0016] The bowling ball stop assembly also can include one or more adjustable connection members/mechanisms that attach one or more support portions coupled to the stop to the support arms of the frame. These adjustable connection members can allow for adjustment of the stop with respect to the frame, for example, to enable adjustment of the location and/or orientation of the stop to fit behind various masking units, curtain walls of different pin setting assemblies, etc.

[0017] Still further, at least a portion of the support portions of the stop and/or the frame support arms can be at least partially received within the gutters of the bowling lane when the stop is in its lowered, extended position to move such components to a position substantially out of the way of maintenance/service personnel accessing the pinsetter, for example, to avoid tripping or falling of maintenance/service personnel when accessing the service area, the pinsetter, etc.

[0018] In one example embodiment, the pinsetter can include a mechanical pinsetter, such as a string pinsetter, free fall pinsetter, etc.

[0019] Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various additional embodiments by reading the following detailed description of the embodiments with reference to the below listed drawing figures.

Brief Description of the Drawings

[0020] The accompanying drawings, which are included to provide a further understanding of the embodiments of the present disclosure, are incorporated in and constitute a part of this specification, illustrate embodiments of the present disclosure, and together with the detailed description, serve to explain the principles of the embodiments discussed herein. No attempt is made to show structural details of this disclosure in more detail than may be necessary for a fundamental understanding of the exemplary embodiments discussed herein and the various ways in which they may be practiced. According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the disclosure.

Figs. 1A and 1B show perspective views of deployable bowling ball stop assemblies according to principles of the present disclosure.

Fig. 2 shows the deployable bowling ball stop assembly of Fig. 1A installed with an example pinsetter assembly/system according to principles the present disclosure.

Figs. 3A and 3B show perspective views of the deployable bowling ball stop assembly of Fig. 1A in a retracted position and an extended position, respectively.

Figs. 4A and 4B show perspective views of the deployable bowling ball stop assembly of Fig. 1B in a retracted position and an extended position, respectively.

Fig. 5 shows an example pinsetter with the deployable bowling ball stop assembly according to Figs. 1A, 2, and 3A-3B and showing an access path for maintenance personnel.

Fig. 6 shows a biasing assembly for the deployable ball stop assembly of Fig. 1B.

Fig. 7 shows a locking assembly/locking features for the deployable ball stop assembly of Fig. 1B

Detailed Description

[0021] Figs. 1A-7 generally illustrate an example bowling ball stop or blocking assembly 10 according to principles of the present disclosure. The bowling ball stop assembly 10 of the present disclosure can be easily or readily deployable adjacent a service area 12 of a bowling lane 14 to stop/block bowling balls, for example, rolled down a bowling lane during maintenance/servicing thereof. It will be understood, the following description is provided as an enabling teaching of embodiments of this disclosure. Those skilled in the relevant art will recognize that many changes can be made to the embodiments described, while still obtaining the beneficial or desired results. It also will be apparent that some of the desired benefits of the embodiments described can be obtained by selecting some of the features of the embodiments without utilizing other features. Accordingly, those who work in the art will recognize that many modifications and adaptations to the embodiments described are possible and may even be desirable in certain circumstances. Thus, the following description is provided as illustrative of the principles of the embodiments of a bowling ball stop assembly and not in limitation thereof.

[0022] Figs. 1A-5 show aspects of the deployable bowling ball stop assembly 10, which generally includes a blocking feature 16; a frame 18 connected to and at least partially supporting the blocking feature 16; and an actuation mechanism 20 coupled to the frame 18 and operable to facilitate movement of the frame 18 for deployment of the blocking feature 16. The deployable bowling ball stop assembly 10 is configured to be connected to or otherwise arranged substantially adjacent a pinsetter assembly 22 for the bowling lane 14, being deployable to protect the service area 12 thereabout. As indicated, the blocking feature 16 is movable between a plurality of positions, including an extended position 24 (Figs. 3B, 4B, and 5) wherein the blocking feature 16 is arranged to block or stop bowling balls rolled down the bowling lane 14 from accessing a secured, open area 26 of the lane 14 defined in and around the pinsetter assembly 22 and service area 12, and a retracted position 28 (Figs. 2, 3A, and 4A) wherein the blocking feature 16 is raised away, retracted, or otherwise moved away from the bowling lane 14 to allow passage of bowling balls and the play of bowling games thereon.

[0023] According to embodiments of the present disclosure, the pinsetter assembly 22 can include any suitable mechanical pinsetter, such as a string pinsetter, free fall pinsetter, etc. In the embodiment illustrated, the pinsetter assembly 22 can include a String Pinsetter as manufactured by Brunswick Bowling Products, LLC of Muskegon MI. In alternative embodiments, however, the pinsetter assembly 22 can include a variety of pinsetter assemblies, including free fall pinsetters, such as a GS-X Pinsetter as manufactured by Brunswick Bowling Products, LLC of Muskegon MI, and other types of pinsetters.

[0024] As generally shown in Figs. 1A-5, the blocking feature 16 can include at least one stop or blocking member 30. The stop 30 typically will be formed from a high-strength, substantially rigid and impact resistant material, such as plywood, metal, or various synthetics or other suitable materials sufficient to withstand the impact of rolling bowling balls without breaking. The stop 30 has a body 32 that includes front 34, rear 36, side 38/40, top 42, and bottom 44 portions or sections, and generally is sized, dimensioned, or otherwise configured to extend substantially across the width of bowling lane 14. The body 32 of the stop 30 also has a height that is sufficient to substantially block/stop bowling balls rolled down the lane 14 and substantially resist or block the ball rolling or bouncing over the stop after impact.

[0025] In one embodiment, the stop 30 further may be configured such that its side portions 38/40 at least partially extend into the gutters 46 of the bowling lane 14, for example, to obstruct/stop bowling balls rolled down the gutter 46 (Figs. 3B, 4B and 5). The stop 30 also may have one or more recesses or cutout portions 48 defined therealong. The recesses 48 can be provided and sized to allow the stop to be deployed to its extended position while bowling lane bumpers (not shown) are activated, *i.e.,* are in a raised configuration/orientation, or with other obstructions within the gutters or lanes.

[0026] In additional configurations/applications, the stop 30 further can include one or more cushioning assemblies 50 attached thereto, as generally shown in Figs. 1A-1B, 2, and 3A. The cushioning assemblies 50 allow the stop to rest on the bowling lane surface 14A, without scratching, scuffing, or otherwise causing damaging thereto, and can include a plurality of cushions or stops 52 arranged substantially adjacent to or along the bottom portion 44 of the stop 30, though other members or mechanisms suitable for preventing damage to the bowling lane surface 14A when engaged by the blocking board can be used without departing from the scope of the present disclosure. The cushions or stops 52 can be formed from rubber, plastic, or other suitable material sufficient to dampen engagement between the cushions/stops 52 and the surface 14A of the bowling lane.

[0027] Figs. 1A-5 also show the attachment of the deployable bowling ball stop 30 to the frame 18. The frame 18 further will be rotatably, pivotably, or otherwise movably attached to at least a portion of the pinsetter setter

assembly 22 for the bowling lane 14, and will be operable to control movement of the stop between its extended 24 and retracted 28 positions.

[0028] In one embodiment, as generally shown in Figs. 1A-5, the frame 18 can include a plurality of support arms, rods, shafts, or other suitable supporting members, including a set of supports or support arms 54 on opposite sides of the frame 18, and a center shaft or cross-wise support 56 that extends between and connects the support arms 54. The stop 30 will be connected to the distal ends 54A of the support arms 54, and the cross-wise support 56 can be connected to the proximal ends 54B of the support arms 54, e.g., at or near the ends 56A/B of the cross-wise support 56 (as shown, for example, in Figs. 1A and 1B). The cross-wise support 56 further generally will be rotatably coupled to a portion of the pinsetter assembly 22, such as by one or more bushings, bearing assemblies and/or other members/mechanisms 58 that facilitate rotation or pivoting of the cross-wise support 56.

[0029] The support arms 54 and/or cross-wise support 56 can be formed from a high-strength, rigid material, such as a metallic material (e.g., steel, aluminum, etc.), a composite material, or other suitable materials without departing from the scope of the present disclosure. The support arms 54 and/or cross-wise support 56 further will be sized, dimensioned, and/or otherwise configured so as to provide a substantially rigid, high-strength frame/support for the stop when in its extended position sufficient to substantially absorb or dampen the energy of bowling ball(s) rolled down the bowling lane. The frame also can be provided with shock absorption effects to further help dampen the energy of bowling balls impacting thereagainst.

[0030] Additionally, as shown in Figs. 1A-5, the actuation mechanism 20 can include a handle or lever 60 attached to the frame 18, and which can be actuated or otherwise engaged and moved to move the stop 30 between its retracted 28 and extended 24 positions. The handle/lever 60 can be coupled to one end, e.g., 56A, of the center shaft 56 so that movement of the handle/lever 60 in a forward or rearward direction will cause rotation of the center shaft 56, which in turn causes the support arms 54 to extend or retract to thus move the stop 30 between its retracted 28 and extended 24 positions.

[0031] In one embodiment, the handle/lever 60 will be positioned so as to be accessible from an access area or path 62 along the bowling lane and/or adjacent the pinsetter. The handle/lever 60 further can be ergonomically shaped to facilitate raising and lowering of the stop 30. In addition, the handle/lever 60 also can be configured or shaped so as to avoid contact or engagement with the parts/components of the pinsetter assembly 22 as the handle 60 is moved to raise and lower the stop. For example, in one embodiment, the handle or lever 60 can have at least one generally S-shaped or Z-shaped portion 64, and also could have at least one stiffening or support member 66 arranged therealong. It will, however, be understood that the handle/lever can have any suitable configuration without departing from the scope of the present disclosure.

[0032] The handle/lever 60 additionally can have one or more locking features or locking assemblies 68, such as a detent, latch, one or more removable pins, or other suitable locking assembly, mechanism, etc. attached thereto for locking or otherwise securing the stop 30 in its retracted and/or extended positions. In one embodiment, as shown in Figs. 1A, the locking feature(s) or assembly 68 can include a pin assembly 100 that includes a pin 102 that is configured to engage at least a portion 104 of the handle/lever 60 and a corresponding portion of the pinsetter 22, or component/part attached thereto, to lock and/or hold/support the deployable bowling ball stop assembly 10 in the retracted position 28. The pin 102 further can be removed or otherwise moved to allow release of the deployable bowling ball stop assembly 10 and movement of the deployable bowling ball stop assembly 10 to its extended position 24. The pin 102 can be received within an opening, hole, etc., 106 defined in or through a rod, flange, or other projecting/extending portion 104 coupled to the handle/lever 60, and the pin 102 further can be received within holes, openings, etc. defined in and/or otherwise engage corresponding portions or parts of the pinsetter 22 or component attached thereto.

[0033] As shown in Fig. 7, in some constructions, the locking feature/assembly 68 can include a latch assembly 110 that includes a rotatable or pilotable latch 112 that engages a portion of the handle/lever 60, such as a rod, flange, etc. 114. Fig. 7 shows that the latch 112 can be pivotally or rotatably connected to a flange, support, or other member 116 of, or coupled to, the pinsetter 22 (e.g., the latch can extend from an opening or slot 116A defined in member 116). The latch 112 further can have a body 118 with a notch or recess 120 defined therein for engaging the rod 114 to lock and/or hold/support the deployable bowling ball stop assembly 10 in its retracted position 28. The latch 112 further is configured to be rotated or pivoted to release/disengage the rod 114 and allow movement of the deployable bowling ball stop assembly 10 to its extended position 24. Any suitable locking features, mechanisms, etc., however, can be used without departing from the scope of the present disclosure.

[0034] The rotatable frame 18 further can be counterbalanced to facilitate raising and lowering of the stop. In one embodiment, as generally shown in Fig. 1A, the frame 18 can include one or more biasing members 70 arranged therealong that can provide biased assistance as the stop 30 is raised towards its retracted position 28 and can further provide resistance as the stop is lowered to its extended position 24, for example, to help slow and/or prevent the stop 30 from forcefully engaging and/or damaging the bowling lane surface. The biasing member(s) 70 can be at least partially received about or otherwise be in communication with the cross-wise support 56 of the frame 18, and can include one or more

torsion springs 72 received along and extending about the cross-wise support 56, and coupled thereto to apply a biasing/torsion force to the cross-wise support 56 as it rotates. Other suitable springs and/or biasing members also can be employed without departing from the scope of the present disclosure.

[0035] Figs. 1B and 6 show an additional or alternative construction including a biasing assembly 150 that can provide biased assistance as the stop 30 is raised towards its retracted position 28 and/or can provide resistance as the stop is lowered to its extended position 24, e.g., to help slow and/or prevent the stop 30 from forcefully engaging and/or damaging the bowling lane surface. As shown in Figs. 1B and 6, the biasing assembly 150 can include a biasing member 152, such as a tension spring or other suitable biasing member, connected to the handle/lever 60. Fig. 6 further shows that the biasing member 152 includes a pair of hooked or looped ends 152A/152B, with one end 152A connected to support member 66 of the handle 60 (e.g., by engaging a hole 154, slot, notch, etc. defined therein) and one end 152B connected to a wall, support, etc. 156 of, or connected, to the pinsetter 22 (e.g., by a fastener 158, such as a bolt, screw, rivet, etc. attached thereto).

[0036] The present disclosure is not limited to the illustrated arrangements/constructions, however, and movement of the frame may be driven and/or controlled by one or more drive mechanism/assemblies, e.g., motors, actuators, etc., without departing from the scope of the present disclosure.

[0037] The bowling ball stop assembly 10 also can include one or more adjustable connection assemblies/mechanisms 74 that attach the stop 30 and the support arms 54 of the frame 18, as generally shown in Figs. 1A and 1B. The adjustable connection assemblies 74 can include one or more supports 76 coupled to the stop, for example, by fasteners 78 (e.g., screws, bolts, rivets, etc.), and adjustable connection members or brackets 80 coupled to the supports 76 and the distal ends 54A of the support arms 54 of the frame 18. These adjustable connection members 80 can allow for adjustment of the stop 30 with respect to the frame 18; for example, enabling adjustment of the stop 30 to fit behind and/or against various masking units, curtain walls of different pin setting assemblies, etc.

[0038] As further shown in Fig. 5, in some embodiments or applications, at least a portion of the support 76 of the stop 30, the frame support arms 54, and/or the connection member 80 can be at least partially received within the gutters 46 of the bowling lane 14 when the stop 30 is in its lowered, extended position 24 to move such components to a position substantially out of the way of maintenance/service personnel accessing the pinsetter, for example, to avoid tripping or falling of maintenance/service personnel when accessing the service area 12 and/or the components of the pinsetter.

[0039] The foregoing description generally illustrates and describes various embodiments of this disclosure. It will, however, be understood by those skilled in the art that various changes and modifications can be made to the above-discussed constructions and systems without departing from the spirit and scope of this disclosure as disclosed herein, and that it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as being illustrative, and not to be taken in a limiting sense. Furthermore, the scope of the present disclosure shall be construed to cover various modifications, combinations, additions, alterations, etc., above and to the above-described embodiments, which shall be considered to be within the scope of this disclosure. Accordingly, various features and characteristics as discussed herein may be selectively interchanged and applied to other illustrated and non-illustrated embodiment, and numerous variations, modifications, and additions further can be made thereto without departing from the spirit and scope of the present invention as set forth in the appended claims.

Claims

1. A pinsetter assembly for a bowling lane, comprising:

a pinsetter configured to set bowling pins for play of a bowling game on the bowling lane; and
a bowling ball stop assembly coupled to the pinsetter, the bowling stop assembly including:

a moveable stop configured to be movable between a plurality of positions including an extended position with the stop located and arranged in front of the pinsetter to block or obstruct bowling balls moving down the bowling lane, and a retracted position, wherein the stop is moved away from the bowling lane to allow passage of bowling balls and the play of the bowling game thereon, and
an adjustable frame including a plurality of supports connected to the stop and rotatably or pivotally attached to the pinsetter, the frame being operable to control movement of the stop between the extended and retracted positions.

2. The pinsetter assembly of claim 1, wherein when the stop is in the extended position, the stop defines a secured area sized, dimensioned, or configured to enable one or more workers to service to the pinsetter, while being sufficiently protected from bowling bowls moving down the bowling lane.

3. The pinsetter assembly of claim 1, wherein the stop includes a board or panel formed from a heavy-duty, substantially impact-resistant material;
or

wherein the stop includes a body that is sized, dimensioned, or configured to extend substantially across the bowling lane, and has a height sufficient to block a bowling ball moving along the bowling lane.

4. The pinsetter assembly of claim 1, wherein the stop further includes side portions that at least partially project into gutters of the bowling lane to substantially obstruct bowling balls moving therealong, when the stop is the extended position.

5. The pinsetter assembly of claim 4, wherein the stop includes one or more recesses configured to at least partially receive bowling lane bumpers to allow the stop to be deployed to the extended position, at least partially projecting into the gutters and with the bowling lane bumpers in a raised orientation or position.

6. The pinsetter assembly of claim 1, wherein the stop further includes one or more cushioning members located along a bottom portion thereof to at least partially engage a surface of the bowling lane so as to substantially inhibit or reduce scratching, scuffing, or damage of the surface of the bowling lane.

7. The pinsetter assembly of claim 1, wherein the plurality of supports includes a set of spaced supports located on opposite sides of the frame, and a cross-wise support that extends between and connects the spaced supports, wherein the stop is connected to distal ends of the spaced supports, and the cross-wise support is rotatably coupled to the pinsetter,
wherein the frame has a handle configured to move the stop between its retracted and extended positions, with a distal end of the handle coupled to the cross-wise support such that movement of the handle in a substantially forward or rearward direction causes rotation of the cross-wise support to move the spaced supports and stop between its retracted and extended positions; and
wherein the frame has one or more biasing members arranged therealong, the biasing members configured to provide a biasing force to urge the stop towards its retracted position as the stop is raised from the bowling lane, and to provide resistance as the stop is lowered to the extended position.

8. The pinsetter assembly of claim 1, wherein the pinsetter includes a string pinsetter or free fall pinsetter.

9. A bowling ball stop assembly for a pinsetter of a bowling lane, comprising:

a moveable blocking feature that is moveable between a plurality of positions, including an extended position with the stop arranged along the bowling lane in front of the pinsetter to block or obstruct bowling balls moving down the bowling lane, and a retracted position with the stop substantially raised away or spaced from the bowling lane to allow passage of bowling balls and play of bowling games thereon, and
a frame including a plurality of supports supporting the blocking feature and configured to guide or facilitate control of movement of the blocking feature between the extended and retracted positions.

10. The bowling ball stop assembly of claim 9, wherein the plurality of supports include a set of spaced supports located on opposite sides of the frame, and a cross-wise support that extends between and connects the spaced supports, wherein the blocking feature is connected to distal ends of the spaced supports, and the cross-wise support is pivotally coupled to the pinsetter.

11. The bowling ball stop assembly of claim 10, wherein the frame further comprises a handle attached thereto and configured to move the blocking feature between its retracted and extended positions, wherein a distal end of the handle is coupled to the cross-wise support so that movement of the handle causes rotation thereof to move the spaced supports and the blocking feature between the retracted and extended positions.

12. The bowling ball stop assembly of claim 11, wherein the frame further comprises one or more biasing members coupled to the spaced supports to provide biased assistance as the blocking feature is raised towards its retracted position and resistance as the blocking feature is lowered to its extended position.

13. The bowling ball stop assembly of claim 12, where the handle includes one or more structure locking features for locking or otherwise securing the blocking feature in the retracted or extended positions.

14. The bowling ball stop assembly of claim 9, wherein at least a portion of the blocking feature and at least a portion of the spaced supports are configured to be received within gutters of the bowling lane when the blocking feature is in its extended position;
or
wherein the blocking feature includes a board or panel formed from a heavy-duty, substantially impact-resistant material that is sized, dimensioned, or configured to extend across the bowling lane, and with a height sufficient to block bowling balls moving along the bowling lane.

15. The bowling ball stop assembly of claim 9, wherein the blocking feature includes one or more recesses to allow the stop to be deployed to the extended position, with portions of the blocking feature projecting

into gutters of the bowling lane while bowling lane bumpers are in an raised position.

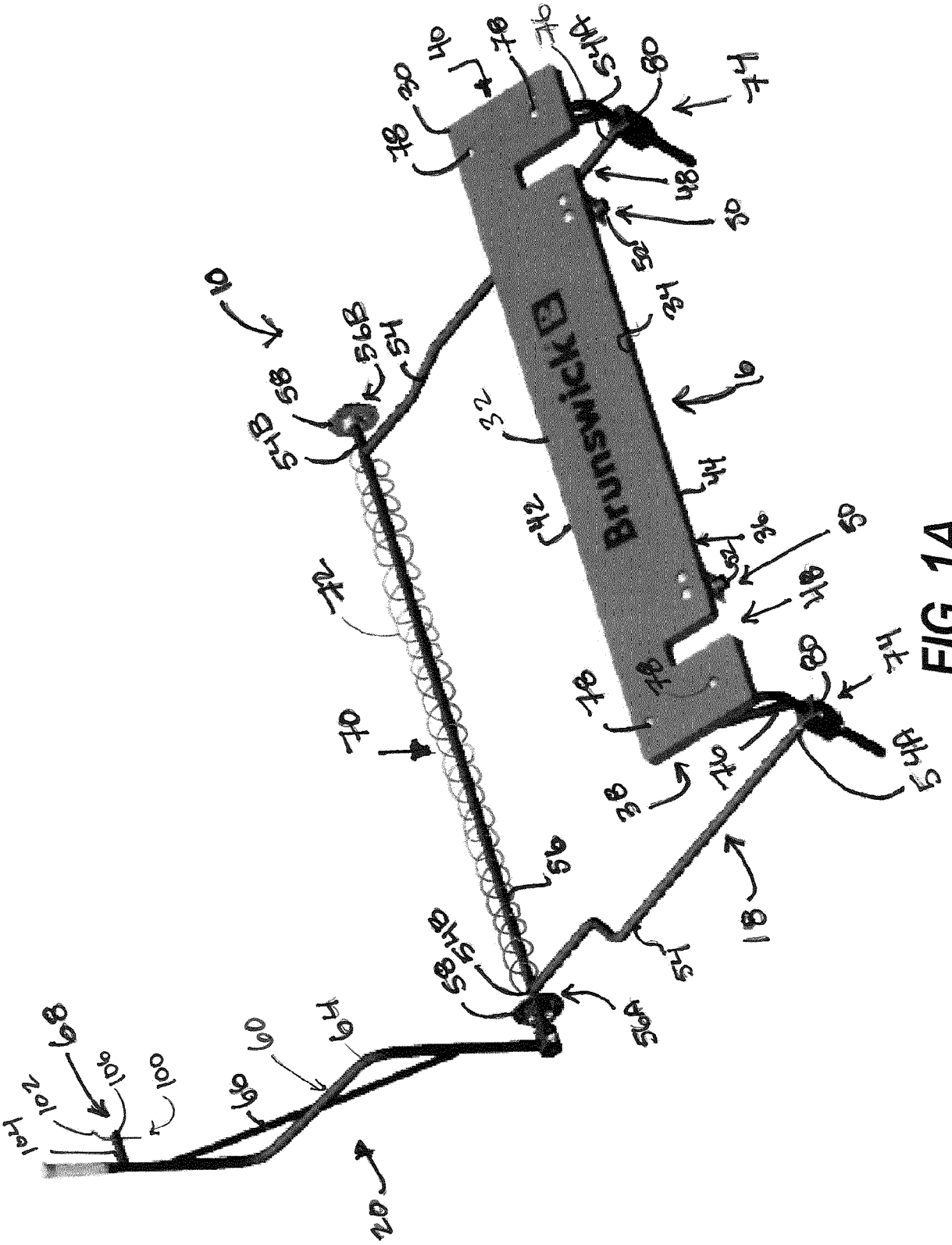

FIG. 1A

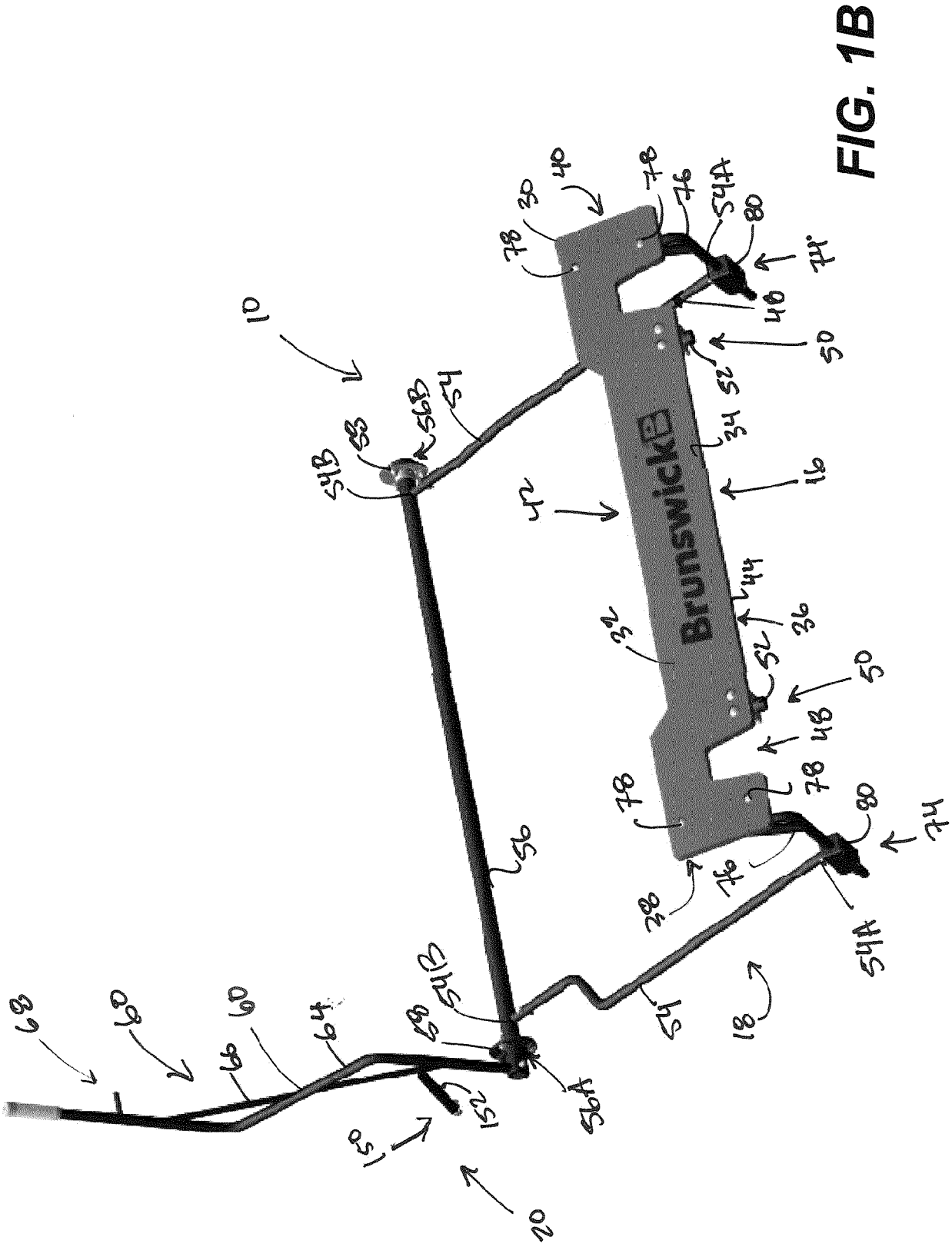

FIG. 1B

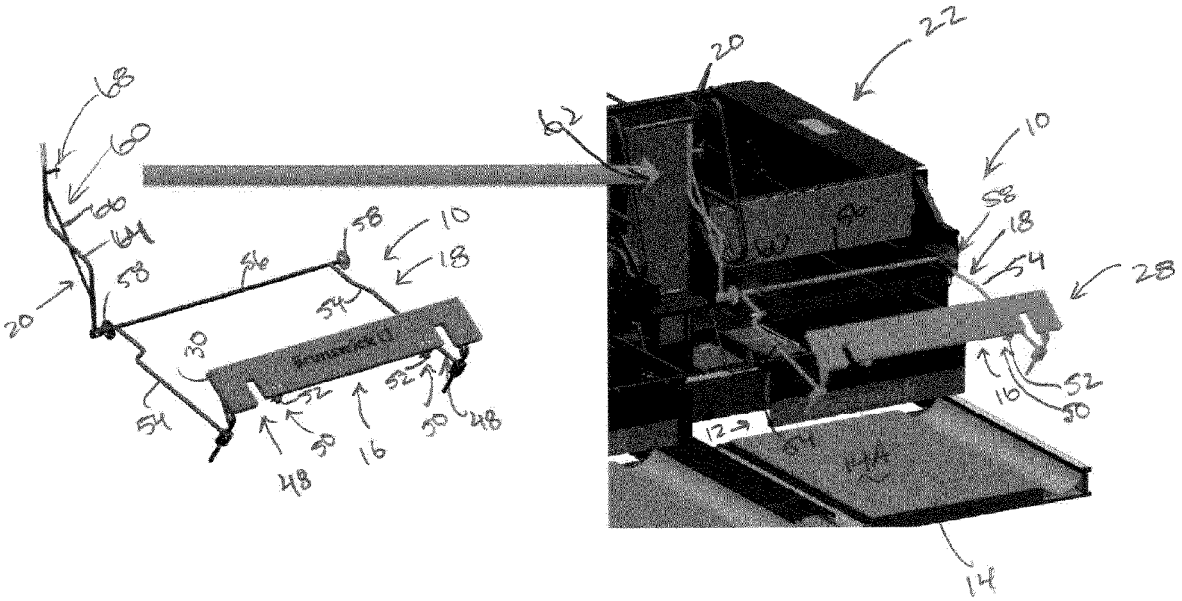

FIG. 2

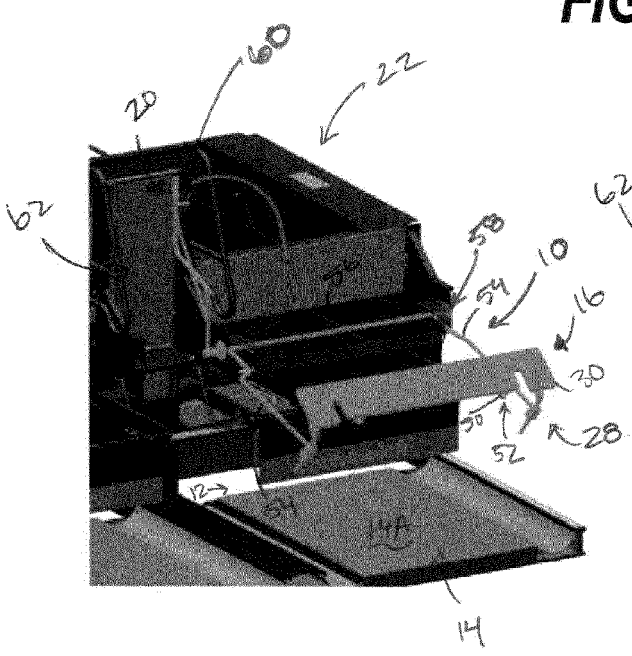

FIG. 3A

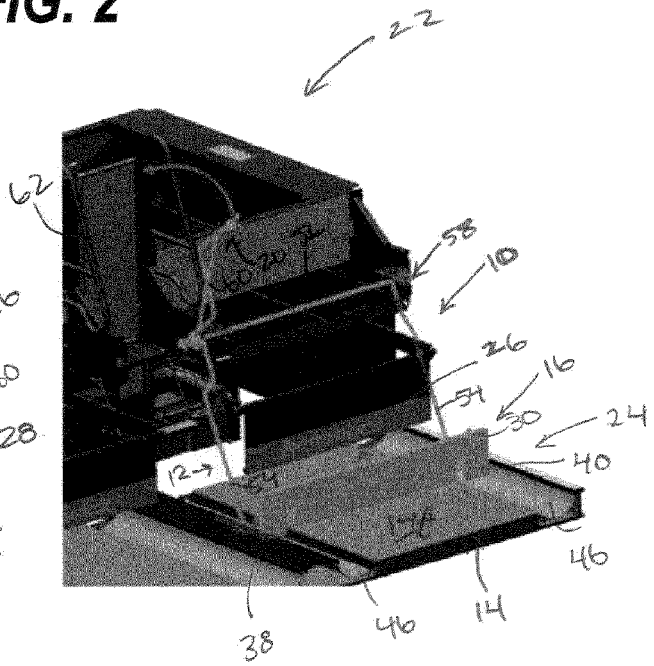

FIG. 3B

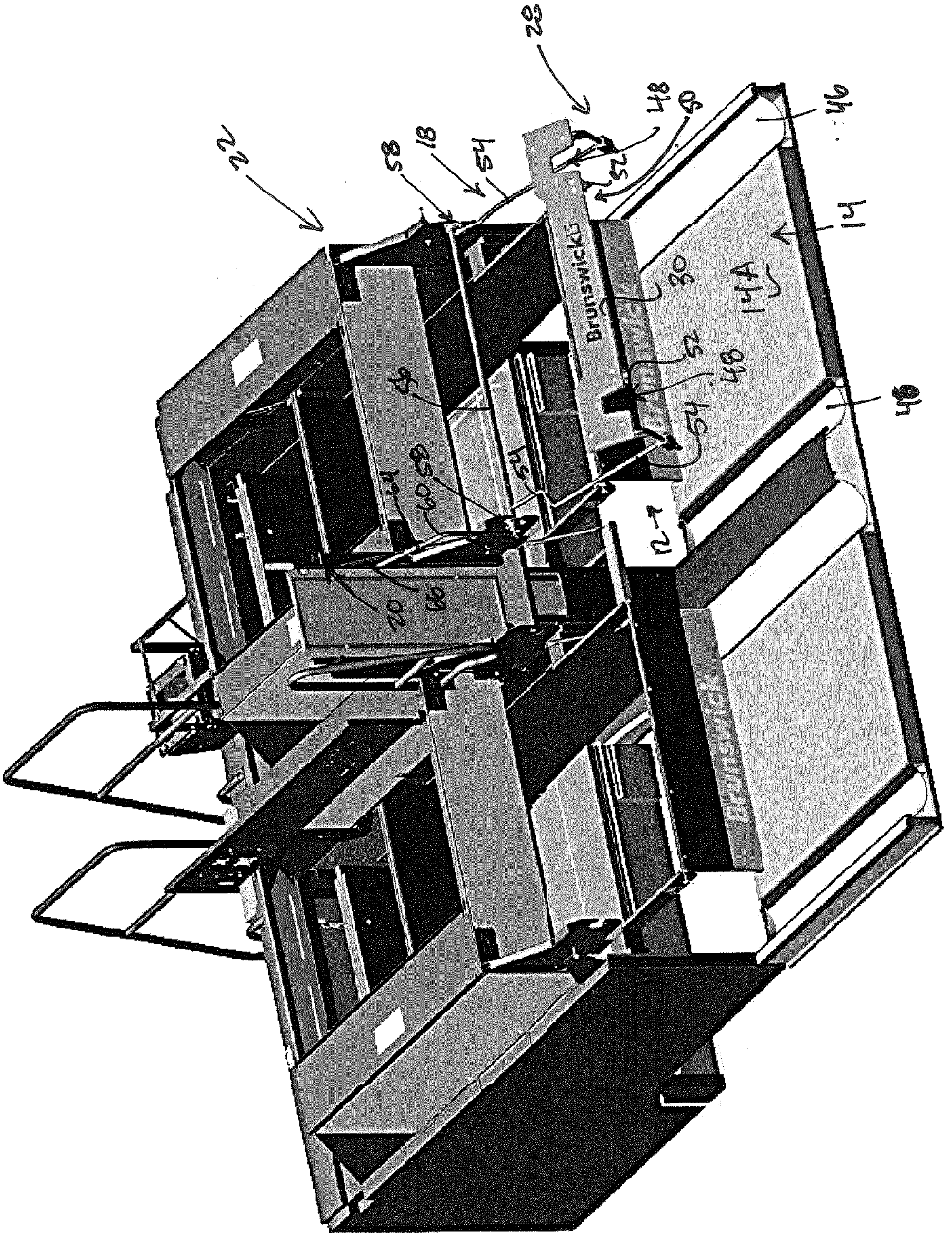
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FIG. 4A

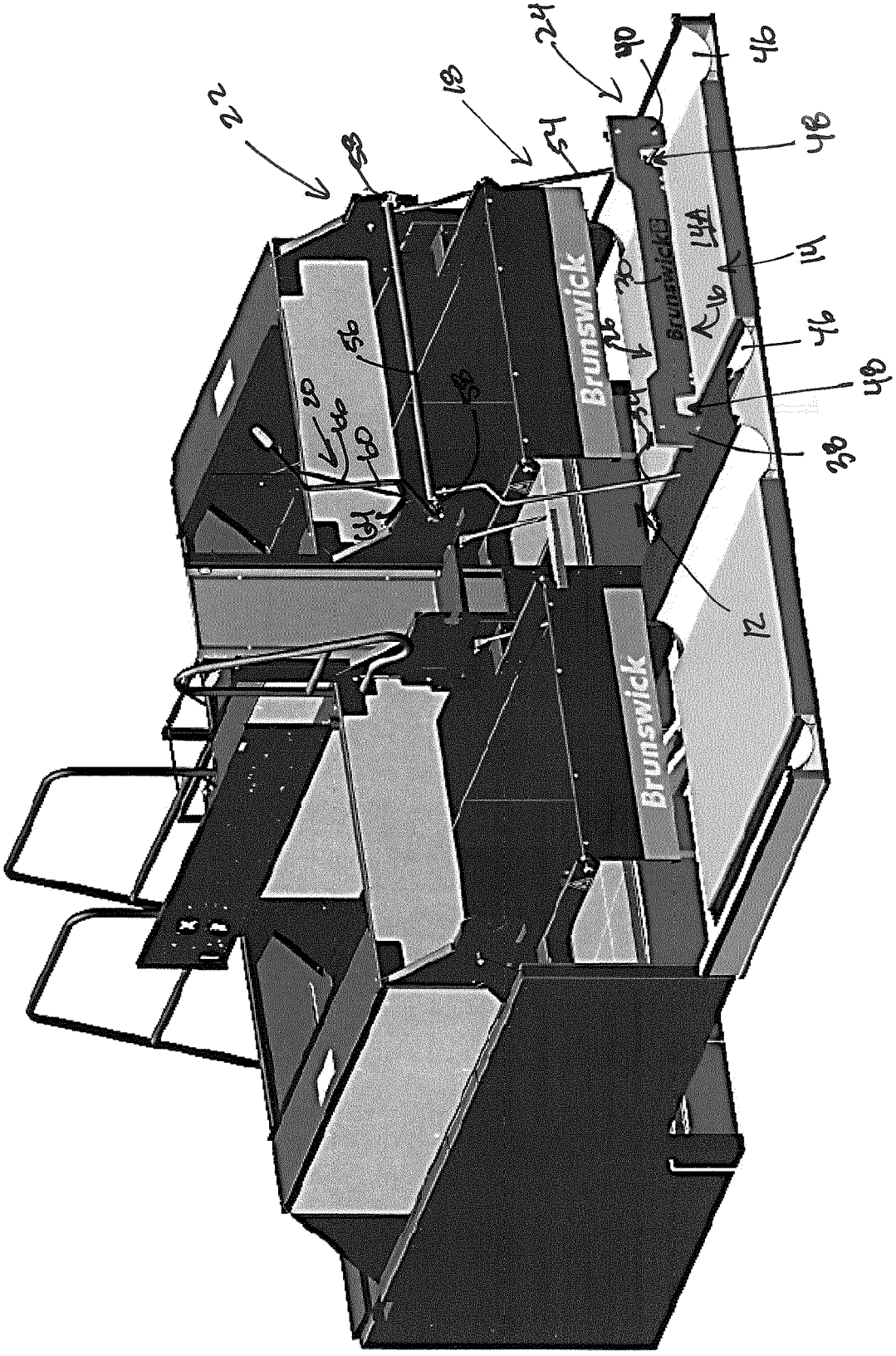

FIG. 4B

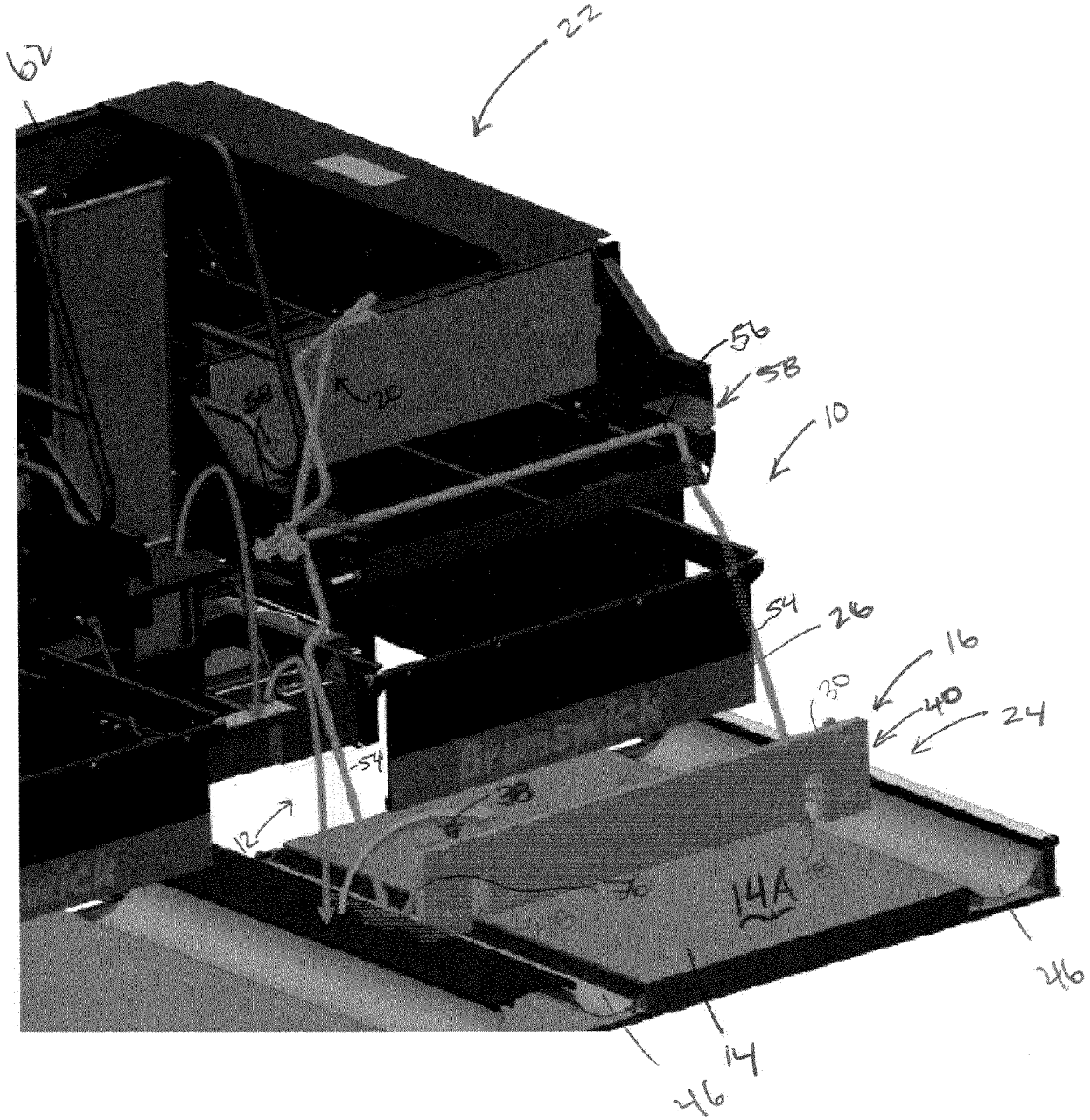

FIG. 5

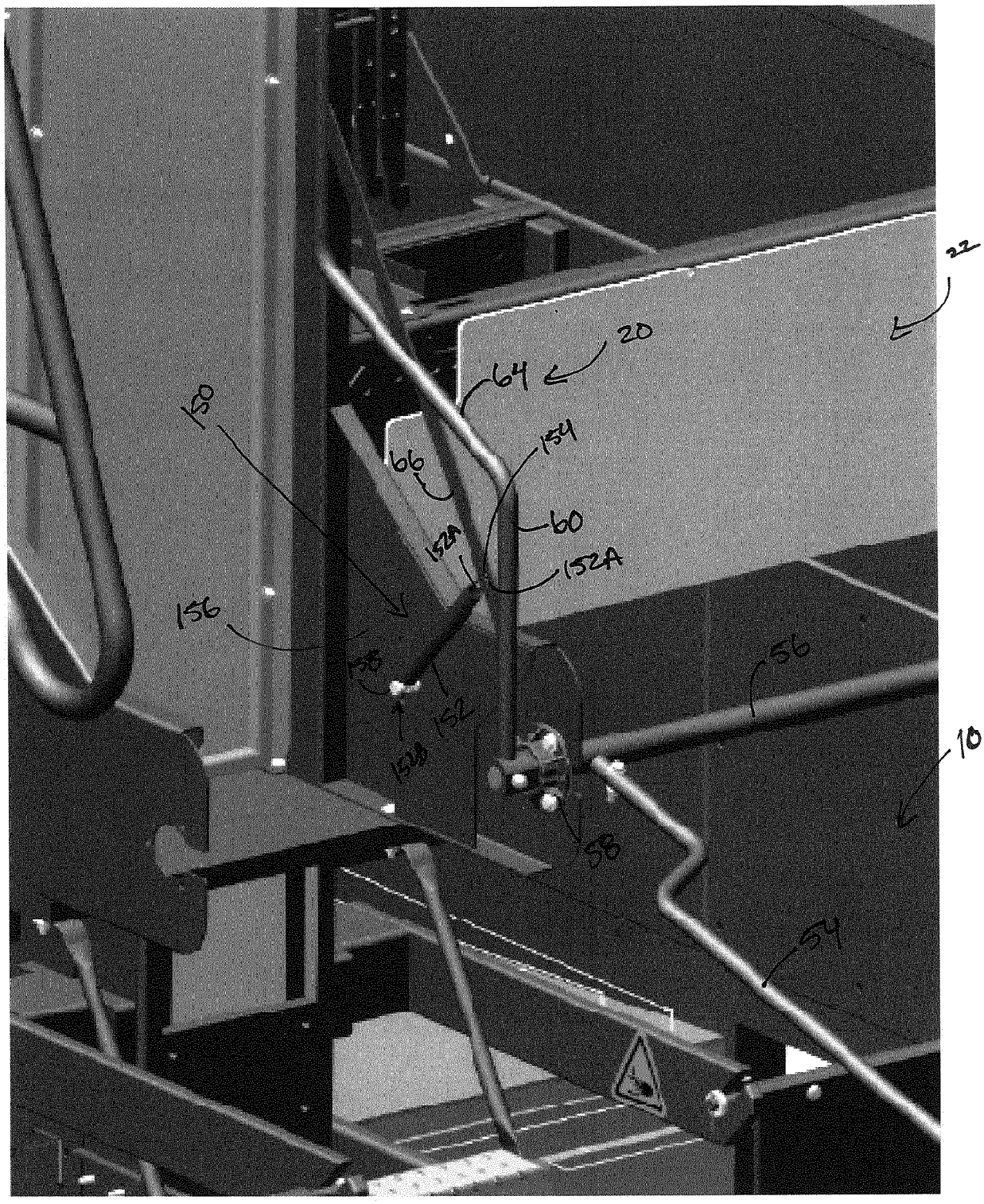

FIG. 6

FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 8488

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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