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(54) Title: SEAL FOR A DOCK LEVELER LIP HINGE

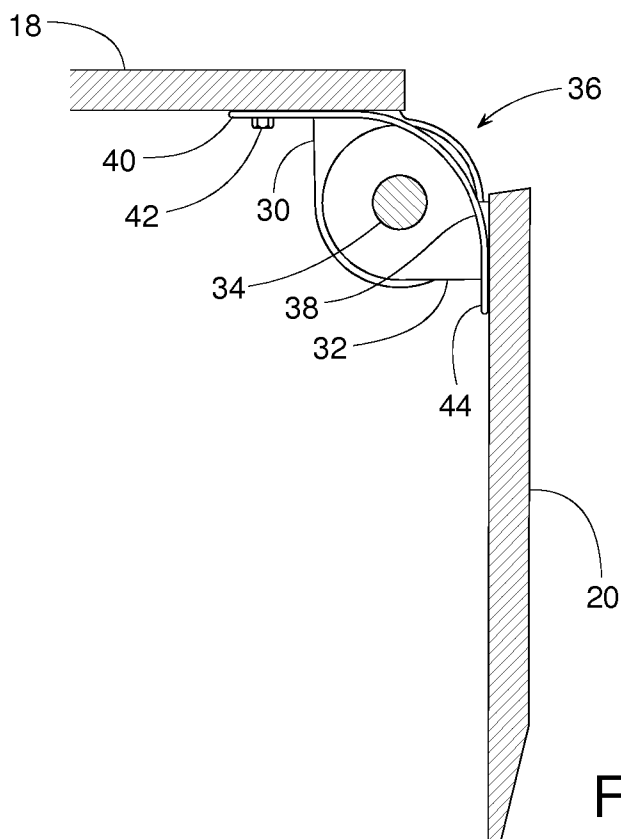


FIG. 6

(57) Abstract: A dock leveler (10) comprising a vehicle-engaging lip (20) pivotally coupled to the vertically adjustable front edge of a deck (18) includes a seal or series of seal segments that close one or more air gaps (36) that exist in the area where the lip is hinged to the deck. Such gaps are particularly large when the lip hinge comprises a hinge pin that couples a series of lugs (30) extending from underneath the deck to a series of lugs (32) extending from the lip, wherein the lugs are spaced apart along the length of the hinge pin (34). The seal or seal segments could be above the deck, below the deck, or interposed between the adjoining edges of the deck and the lip. In some cases, the seal is provided by an air curtain or by a tube that is inflatable or hermetically sealed.

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SEAL FOR A DOCK LEVELER LIP HINGE**Field of the Disclosure**

[0001] The subject disclosure generally pertains to the lip hinge of a dock leveler and, more specifically, to a seal for such a hinge.

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Background of Related Art

[0002] A typical loading dock of a building includes an exterior door with an elevated platform for loading and unloading cargo from vehicles, such as trucks and trailers. Many loading docks include a dock lever that enables personnel and material handling equipment to readily move on and off the vehicle bed during loading and unloading operations.

10

[0003] A typical dock leveler includes a deck that is pivotally hinged along its back edge (or is otherwise mounted for vertical movement) so that the elevation of the deck's front edge can be adjusted to generally match the elevation of vehicle's bed. An extension plate or lip extends outward from the deck's front edge so that the lip can span the gap between the rear edge of the vehicle and the front edge of the deck, thereby creating a bridge between the deck and the vehicle's bed. A lip hinge pivotally coupling the lip to the deck allows the lip to pivot between an extended operative position (where the lip is resting upon the bed of the vehicle) and a pendant position for when the dock leveler is not in use or during certain types of loading and unloading operations. Some known deck and lip hinge form a significant gap and/or a series of gaps between the front edge of the deck and the lip when the lip is stored in a pendant position. Such a gap or series of gaps can introduce outdoor air into the pit area directly underneath the deck.

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Brief Description of the Drawings

[0004] Figure 1 is a schematic side view of a prior art dock leveler at a loading dock.

[0005] Figure 2 is a perspective view of a prior art dock leveler.

25

[0006] Figure 3 is a cross-sectional view similar to Figure 4 but showing a lip of the dock leveler in an extended position.

[0007] Figure 4 is a cross-sectional view taken along line 4-4 of Figure 2.

[0008] Figure 5 is a cross-sectional view of a dock leveler with its lip extended, wherein the dock leveler includes an example seal as disclosed herein.

30

[0009] Figure 6 is a cross-sectional view similar to Figure 5 but with the lip in a pendant position.

[0010] Figure 7 and 8 are views similar to Figures 5 and 6 respectively illustrating an alternative example seal as disclosed herein.

[0011] Figure 9 and 10 are views similar to Figures 5 and 6 respectively but illustrating yet another alternative example seal as disclosed herein.

5 [0012] Figures 11 and 12 are views similar to Figure 5 and 6 respectively but illustrating yet another alternative example seal as disclosed herein.

[0013] Figure 13 and 14 are views similar to Figure 5 and 6 respectively but illustrating yet another alternative example seal as disclosed herein.

10 [0014] Figure 15 and 16 are views similar to Figure 5 and 6 respectively but showing an example seal suspended by an overhead door.

[0015] Figure 17 and 18 are views similar to Figure 15 and 16 respectively but illustrating yet another example seal suspended by an overhead door.

[0016] Figures 19 and 20 are views similar to Figures 5 and 6 respectively but showing an example seal that can be removed completely from the dock leveler.

15 [0017] Figures 21 and 22 are views similar to Figures 5 and 6 respectively but showing an example seal that overlays the deck and lip of a dock leveler.

[0018] Figures 23 and 24 are views similar to Figures 5 and 6 respectively but showing an example seal that is to be pinched between the deck and lip of a dock leveler.

20 [0019] Figures 25 and 26 are views similar to Figures 5 and 6 respectively but showing an example seal that can be inflated or hermetically sealed.

[0020] Figures 27 and 28 are views similar to Figures 5 and 6 respectively but showing an example forced current of air that determines the direction of airflow through the gap of a lip hinge.

25 [0021] Figures 29 and 30 are views similar to Figures 5 and 6 respectively but showing an example seal in proximity with the lip hinge pin of a dock leveler.

Description of the Preferred Examples

[0022] Figures 1 – 4 illustrate a conventional dock leveler 10 installed at a loading dock 12 to facilitate the loading and unloading of a vehicle 14 at a vertically movable door 16. Dock leveler 10 comprises a deck 18, a lip 20, and a lip hinge 22. A rear deck hinge 24, or some other means, renders a front edge 26 of deck 18 vertically movable to accommodate an indeterminate bed height of vehicle 14. Lip hinge 22 pivotally couples lip 20 to deck 18 so that lip 20 can pivot between a pendant position (Fig. 4) and an extended operative position

30

(Fig. 3). In the extended position, lip 20 can rest upon the bed of vehicle 14 to create a material handling bridge between vehicle 14 and a platform 28 of dock 12. Lip 20 can be moved to the pendant position for storage or for certain vehicle servicing operations.

[0023] Lip hinge 22 of dock leveler 10 comprises a plurality of deck lugs 30 extending from underneath deck 18 and a plurality of lip lugs 32 extending from lip 20. Lugs 30 and/or 32 can be welded or otherwise attached to their respective structure from which they extend. A hinge pin 34 couples lugs 30 to lugs 32 so that lip 20 can pivot relative to deck 18.

[0024] When the dock leveler 10 is not in use, the deck is typically stored horizontally with the lip 20 in the pendent position. In this position, a significant air gap 36 and/or series of air gaps exist between lip 20 and deck 18. In particular, the gap 36 and/or series of gaps are created by the spaced-apart hinge lugs 30 and 32 and allow outdoor air to flow to an area underneath the deck 18. If gap 36 is left exposed or unsealed, indoor or outdoor air can leak through gap 36. Such a gap 36 or series of gaps that are unsealed or exposed can introduce outdoor air into a pit area directly underneath the deck 18. If the outdoor air is sufficiently cold, condensation and frost might accumulate on the upper traffic surface of the deck 18, as the deck 18 is typically thermally conductive and exposed to relatively warm indoor air. If the outdoor air is warmer than the indoor air, moisture might condense on the underside of the deck, which can lead to corrosion of the dock leveler's 18 components.

[0025] In the following, various example methods and apparatus are disclosed to provide a mechanical and/or fluid dynamic seal that substantially prevents or obstructs or, at least controls, the airflow through gap 36.

[0026] An example seal 38 illustrated in Figures 5 and 6, for instance, includes one or more resiliently flexible members that span gap 36. A plurality of seals 38 are installed to cover a series of gaps 36 created by axially spaced apart lugs 30 and/or 32. Seal 38 can be of any appropriate shape, size, and/or material including, but not limited to, a piece of resiliently flexible material (e.g., sheet metal); a brush; or a sheet, pad or block of foam, plastic or rubber. One end 40 of seal 38 can be attached to deck 18 by way of any suitable fastener 42 including, but not limited to, a screw, adhesive, weld bead, etc. An opposite end 44 of seal 38 can slidingly seals against the underside of lip 20 as lip 20 pivots between the extended position (Fig. 5) and the pendant position (Fig. 6).

[0027] Alternatively, as illustrated in Figures 7 and 8, end 40 of seal 38 can be attached to lip 20 while end 44 slidingly seals against the underside of deck 18.

[0028] In other example implementations, a seal, similar to seal 38, may be implemented with a mounting structure or fastener. For example, as illustrated in Figures 9 and 10, a

flexible seal 46 includes a mounting structure or fastener (illustratively, in the form of a clip 48) that attaches to hinge pin 34 so that both ends 50 and 52 of seal 46 can slidingly seal against their respective sealing surfaces of deck 18 and lip 20.

5 **[0029]** In another example, as illustrated in Figures 11 and 12, a seal 54 is provided which includes an alternate mounting structure to clip 48. In this example, the seal 54 comprises one or more resiliently flexible ends 56 and/or 58 that can slidingly seal against respective sealing surfaces of deck 18 or lip 20. End 56 of seal 54, for example, can comprise a polyethylene sheet of material 60 sewn within a fabric cover 62 that wraps around hinge pin 34. A hook-and-loop fastener 64 can help hold seal 54 to hinge pin 34. End 58 of seal 54
10 can be an extension of fabric cover 62.

[0030] In another example shown in Figures 13 and 14, one or more seals 66 comprise a tubular piece or structure. The tubular piece may be made of polyurethane foam, similar to that commonly used for insulating pipes, or any other suitable insulating material(s). In some example implementations, seal 66 is implemented by a series of relatively short segments
15 distributed axially along hinge pin 34 to cover or fill gap(s) 36 that might otherwise exist between lugs 30 and/or 32. Seal 66 preferably has an outer perimeter that can press radially outward against deck 18 and lip 20. In other example implementations, seal 66 includes a joint 68 that is held together by adhesive or by any other suitable fastening mechanism(s). In yet other example implementations, seal 66 is a jointless tube that is installed at the same
20 time hinge pin 34 is inserted through lugs 30 and 32.

[0031] In yet another example shown in Figures 15 and 16, a seal 70 comprises a flexible fabric or sheet of material suspended from door 16 such that seal 70 overlays gap 36 when door 16 is in a closed position (Fig.16). As illustrated in Figures 17 and 18, a seal 72 similar to seal 70 of Figures 15 and 16 is made of sheet metal, as shown in Figures 17 and 18.

25 **[0032]** Referring to Figures 19 and 20, another alternative example seal 74 is made of a sheet of material removably held in place by one or more magnets 76. In this example, seal 74 is removed when the dock leveler 10 is in use. When the dock leveler 10 is inactive or stored, seal 74 can be laid over gap 36, as shown in Figure 20.

[0033] Figures 21 and 22 show a seal 78 that is similar to seal 38 of Figures 5 and 6, but
30 installed on top of deck 18 and lip 20. In this example, seal 78 is resiliently flexible and has a relaxed shaped as shown in Figure 22. The flexibility of seal 78 enables seal 78 to flex from its shape of Figure 22 to that of Figure 21. Either end of seal 78 can be attached to lip 20 (as shown) and/or attached to deck 18. This configuration is particularly advantageous because installing the seal 78 atop of deck 18 and lip 20 enables seal 78 to be made as a substantially

unitary structure (e.g., a single, full-length piece extending the width of the deck) rather than having to make seal 78 as a plurality of segments that cover and/or fit within the gaps between lugs 30 and 32. Seal 78 can be made of any suitable material including, but not limited to, plastic or rubber.

5 **[0034]** In another example shown in Figures 23 and 24, a seal 80 includes a serpentine or accordion-type sheet that can be made of plastic, metal, or any other suitable material(s) that can flex and/or fold. When lip 20 is in the pendant position as shown in Figure 24, seal 80 can expand to cover any gap that might otherwise exist between lip 20 and deck 18. When lip 20 is in the extended position as shown in Figure 23, seal 80 collapses upon being pinched
10 between lip 20 and deck 18.

[0035] In yet another example shown in Figures 25 and 26, a seal 82 comprises a series of gas-filled flexible tubes 84 that are distributed along the length of hinge pin 34 to help fill the air gaps between lugs 30 and/or 32. A hollow chamber 86 within each tube 84 can be permanently charged with a fixed amount gas and hermetically sealed and/or a common
15 manifold 88 can connect tubes 84 to the discharge of a blower 90 that delivers a supply of pressurized air into the tubes.

[0036] Figures 27 and 28 illustrate a method of substantially inhibiting outdoor air 92 from flowing into the building through gap 36. Blower 90 draws in outdoor air 92 and discharges it through a manifold 94 that includes a plurality of nozzles 96 aimed at gap 36. Nozzles 96
20 discharge the drawn-in outdoor air 92 upward and outward toward and/or through gap 36, thereby creating an outward flowing current of air 98 that inhibits outdoor air 92 from flowing in the opposite direction of air 98 through gap 36.

[0037] Figures 29 and 30 illustrate a plurality of example seals 100, each of which includes one end 102 attached to the underside of deck 18 or lip 20. An opposite end 104 of each seal
25 100 slidingly engages and/or is at least sufficiently close to shaft 34 to provide a substantial obstruction to substantially prevent the ingress of air attempting to pass through gap 36. In the illustrated example, seals 100 are distributed along the length of hinge pin 34 to fill the plurality of gaps created by the axially spaced apart lugs 30 and/or 32. In the illustrated example, seal 100 is preferably made of a resiliently flexible metal or polymeric material.
30 However, in other example implementations, seal 100 can be made of a rigid material (e.g., plastic), particularly if seal 100 is positioned in close proximity to shaft 34 and does not engage and/or slide against shaft 34.

[0038] From the foregoing, it will be appreciated that example methods and apparatus have been disclosed whereby an air gap between the deck and lip of a dock leveler is at least

partially blocked by a seal that extends from the lip to the deck in the vicinity of a hinge that pivotally couples the lip to the deck.

[0039] In some examples, a seal for a dock leveler's lip hinge is installed beneath the deck and the lip.

5 [0040] In some examples, the seal is disposed generally above the deck, lip and lip hinge.

[0041] In some examples, a seal for a dock leveler's lip hinge includes some seal segments that extend from the lip to the hinge pin and other seal segments that extend from the deck to the hinge pin.

[0042] In some examples, a seal is attached to the lip and slidingly engages the deck, and
10 in other examples, the seal is attached to the deck and slides against the lip.

[0043] In some examples, the gap between a lip and a deck is sealed by a seal member that is attached to a hinge pin.

[0044] In some examples, the gap between a lip and a deck is sealed by a tubular seal member made of resiliently compressible foam.

15 [0045] In some examples, the gap between a lip and a deck is sealed by a tubular seal member that is inflated by a blower or is hermetically sealed with a fixed charge of gas.

[0046] In some examples, the gap between the lip and deck of a dock leveler is sealed by a seal member that is carried by a vertically operating door that is adjacent to the dock leveler.

[0047] In some examples, the gap between a lip and a deck is sealed by a removable seal
20 member that can be held in place by a magnet.

[0048] In some examples, an inward flow of air through the gap between a lip and a deck of a dock leveler is inhibited by blowing a current of air outward through the gap.

[0049] Although certain example methods, apparatus and articles of manufacture have been described herein, the scope of coverage of this patent is not limited thereto. On the
25 contrary, this patent covers all methods, apparatus and articles of manufacture fairly falling within the scope of the appended claims either literally or under the doctrine of equivalents.

Claims

1. A seal for a dock leveler that includes a pivotal lip hinged to a vertically movable deck, wherein the deck and the lip define a gap therebetween, the seal comprising:
a flexible member spanning the gap.
5
2. A dock leveler, comprising:
a deck that is vertically movable;
a lip hinged to the deck such that the lip, relative to the deck, is pivotal between a pendant position and an extended position, the lip and the deck define a gap therebetween
10 when the lip is in the pendant position; and
a flexible seal spanning the gap.
3. The dock leveler of claim 2, wherein the flexible seal is underneath the deck and the lip when the lip is in the extended position.
15
4. The dock leveler of claim 2, wherein the flexible seal slidingly engages at least one of the deck and the lip.
5. The dock leveler of claim 2, further comprising a hinge pin that pivotally couples the lip to the deck, wherein the flexible seal is attached to the hinge pin.
20
6. The dock leveler of claim 5, further comprising a hook-and-loop fastener attached to the flexible seal, wherein the hook-and-loop fastener couples the flexible seal to the hinge pin.
25
7. The dock leveler of claim 5, further comprising a clip attached to the flexible seal, wherein the clip helps fasten the flexible seal to the hinge pin.
8. The dock leveler of claim 2, further comprising:
30 a plurality of deck lugs extending outwardly from underneath the deck;
a plurality of lip lugs extending from the lip; and
a hinge pin coupling the plurality of deck lugs to the plurality of lip lugs, thereby pivotally coupling the lip to the deck.

9. The dock leveler of claim 8, wherein the plurality of deck lugs and the plurality of lip lugs define a plurality of gaps distributed along a length of the hinge pin; and further comprising a plurality of seals disposed within the plurality of gaps, wherein the flexible seal is one of the plurality of seals.
10. The dock leveler of claim 2, wherein the flexible seal is tubular.
11. The dock leveler of claim 2, wherein the flexible seal comprises a resiliently compressible foam material.
12. The dock leveler of claim 2, wherein the flexible seal comprises a fabric material.
13. The dock leveler of claim 2, wherein the flexible seal comprises a resiliently flexible sheet metal.
14. The dock leveler of claim 2, wherein the flexible seal extends from a door that is above the deck.
15. The dock leveler of claim 2, wherein the flexible seal is above the deck and the lip when the lip is in the extended position.
16. The dock leveler of claim 2, further comprising a magnet that attaches the flexible seal to at least one of the deck and the lip.
17. The dock leveler of claim 2, wherein the flexible seal is positioned to be pinched between the deck and the lip when the lip is in the extended position.
18. The dock leveler of claim 2, wherein the flexible seal comprises an inflatable tube.
19. The dock leveler of claim 2, wherein the flexible seal defines a hollow chamber that is substantially hermetically sealed.

20. A dock leveler, comprising:
a deck that is vertically movable;
a lip that relative to the deck is pivotal between a pendant position and an extended position;
- 5 a hinge pin that pivotally couples the lip to the deck; and
a plurality of seals each of which include one end that is attached to at least one of the deck and the lip and an opposite end that is adjacent to the hinge pin.
21. The dock leveler of claim 20, wherein the opposite end slidingly engages the hinge
10 pin.
22. The dock leveler of claim 20, wherein at least one seal of the plurality of seals is attached to the deck, and at least a second seal of the plurality of seals is attached to the lip.
- 15 23. A method of providing a weather resistant dock leveler that includes a pivotal lip hinged to a vertically movable deck, wherein the deck and the lip define a gap therebetween, the method comprising:
drawing in a current of outdoor air; and
forcing the drawn-in outdoor air upward and outward through the gap, thereby
20 substantially inhibiting other outdoor air from passing through the gap.

FIG. 1
PRIOR ART

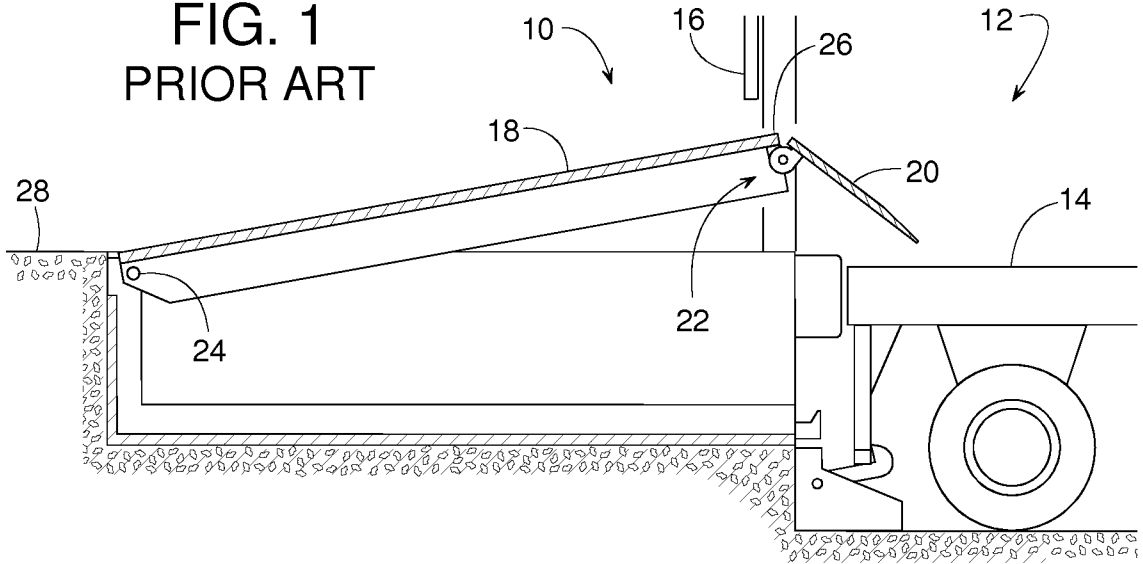


FIG. 2
PRIOR ART

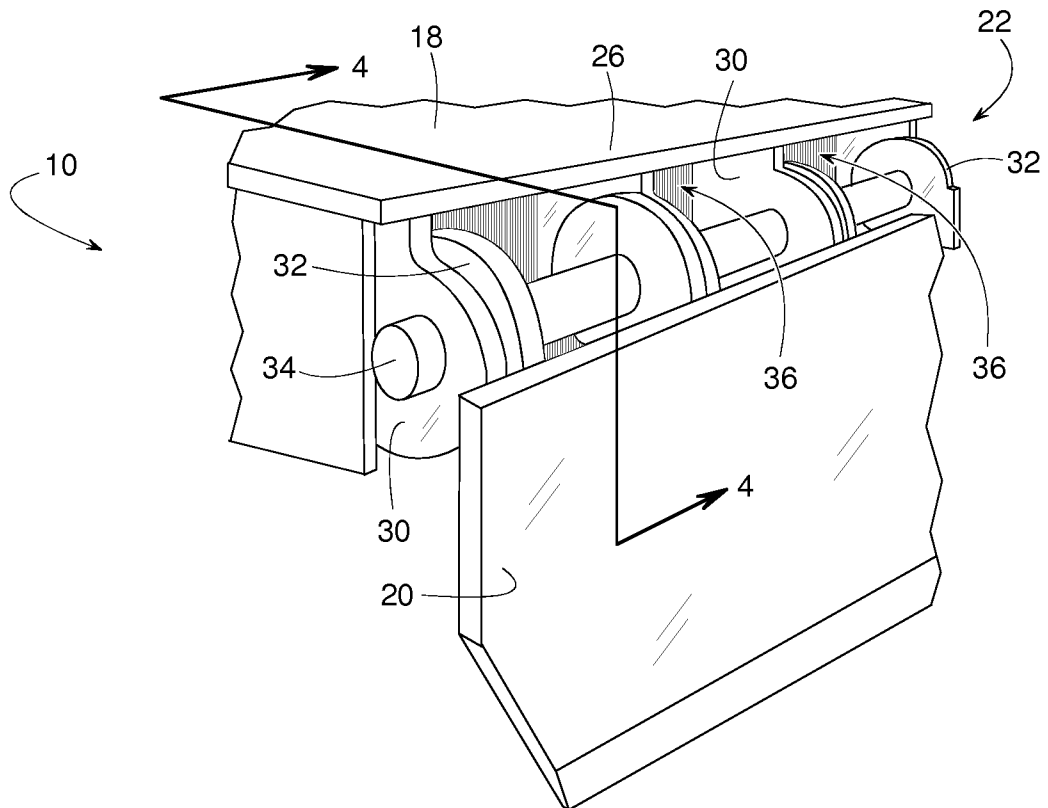


FIG. 3
PRIOR ART

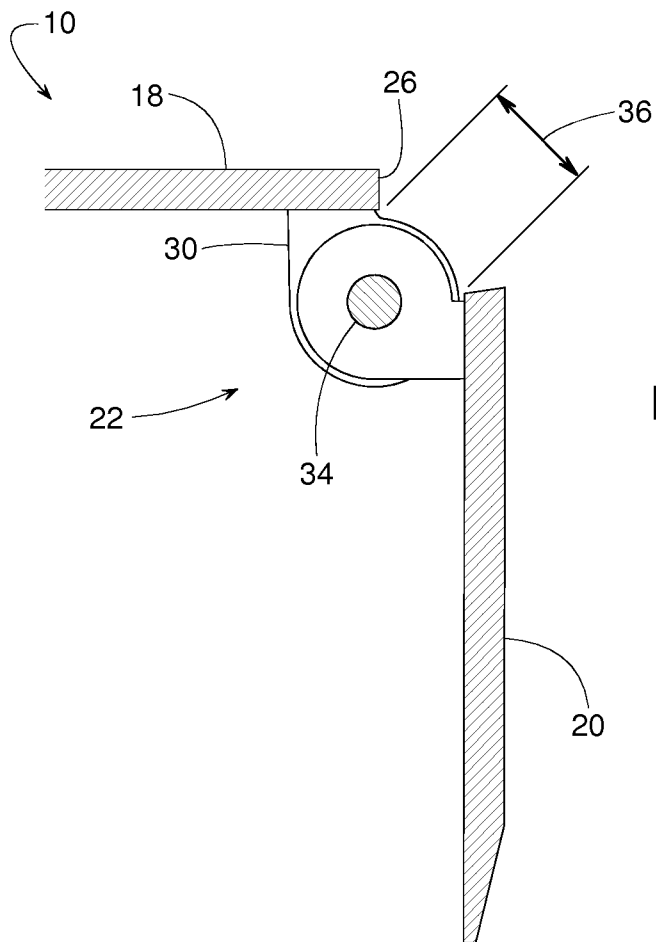
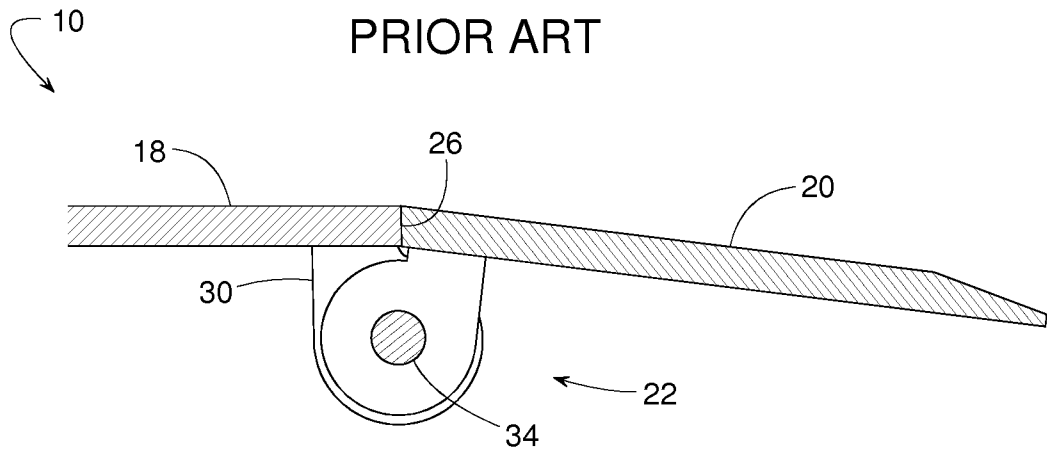


FIG. 4
PRIOR ART

FIG. 5

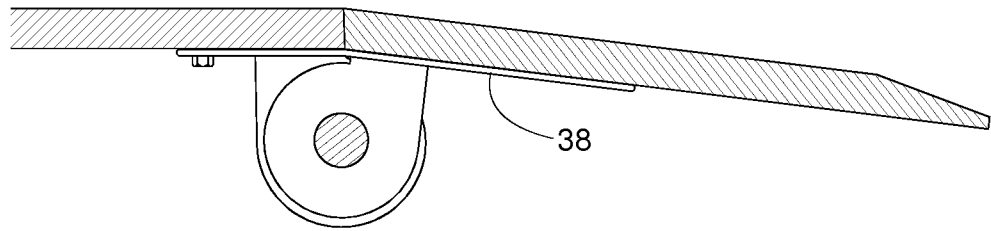


FIG. 6

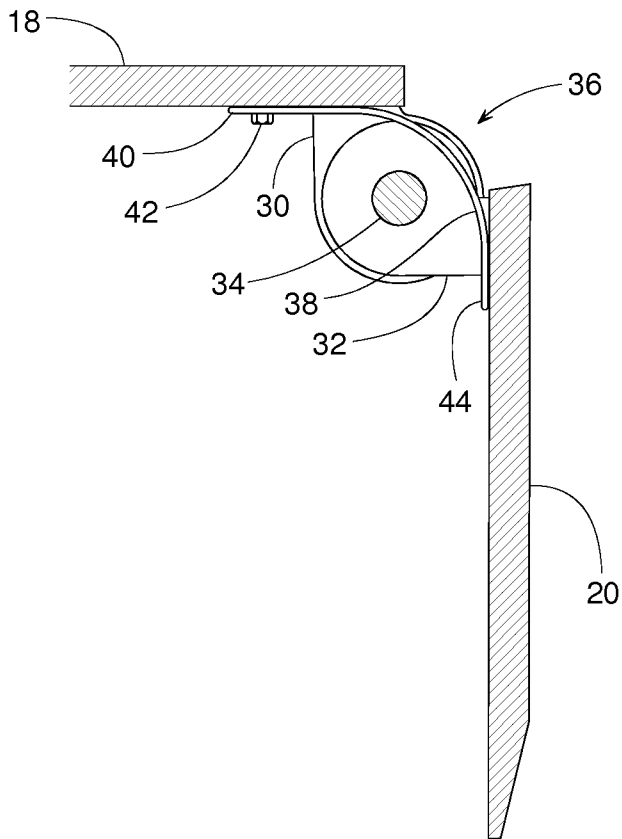


FIG. 7

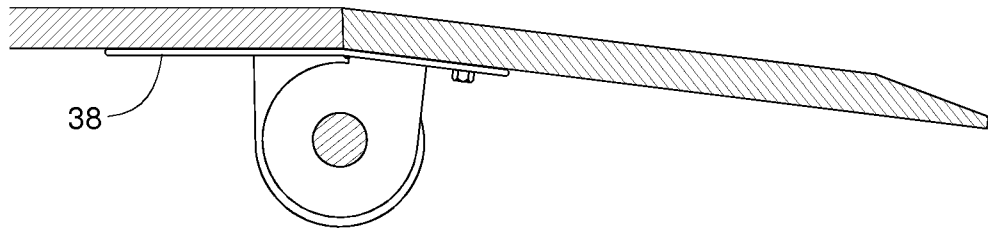


FIG. 8

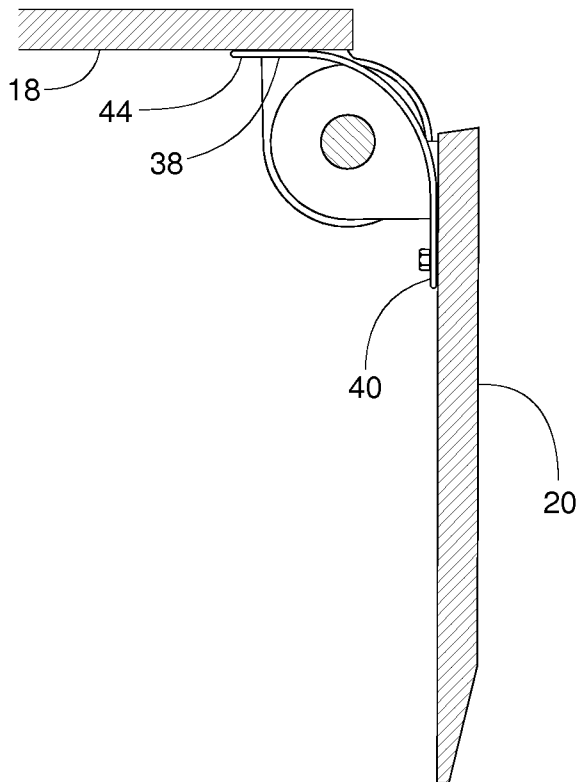


FIG. 9

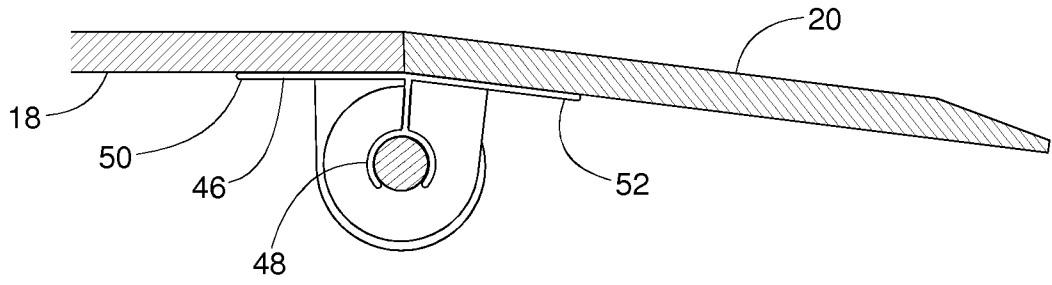


FIG. 10

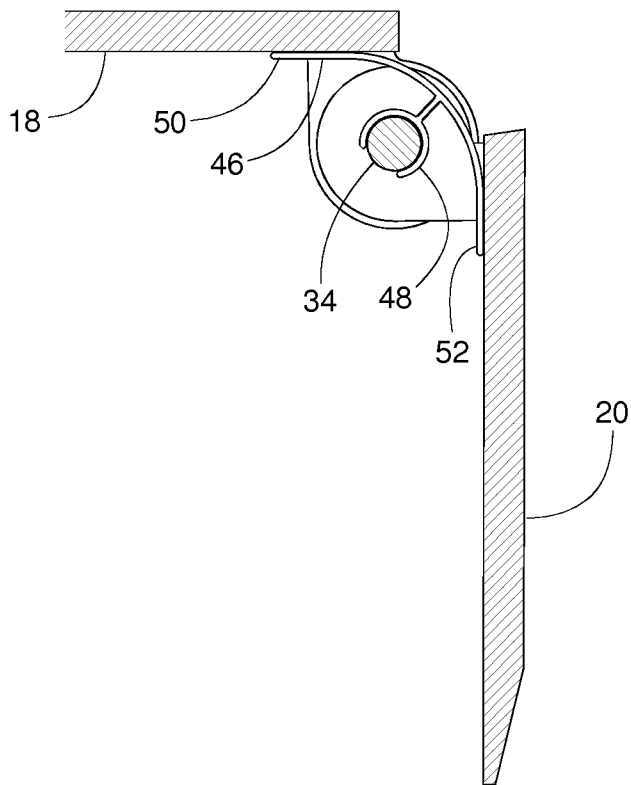


FIG. 11

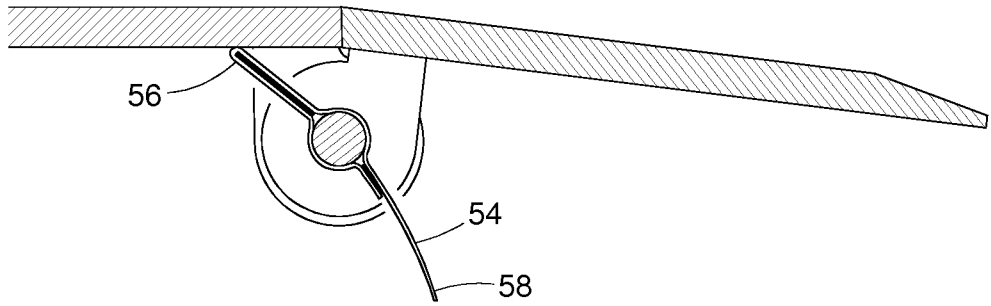
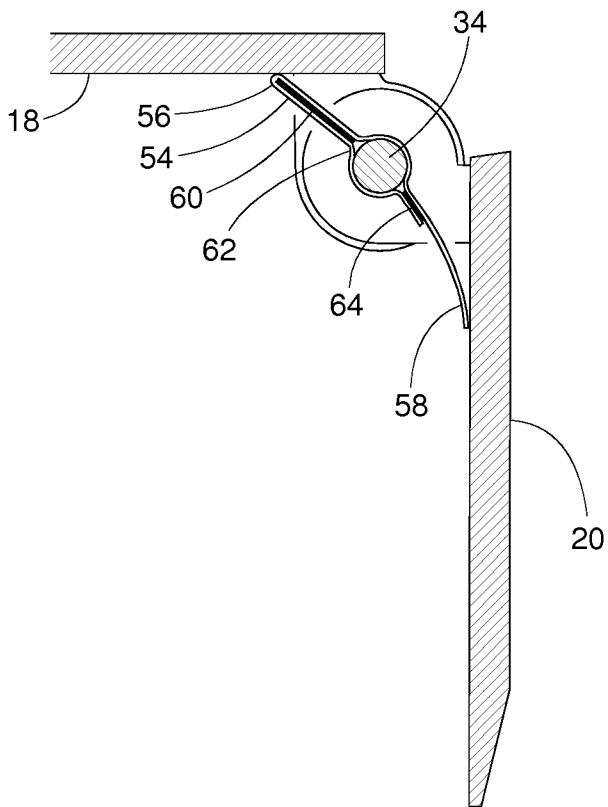


FIG. 12



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FIG. 13

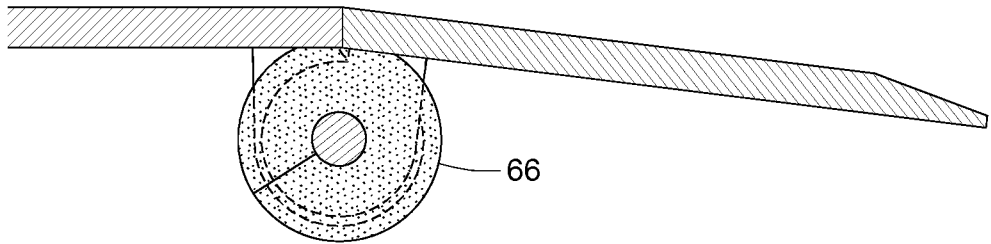
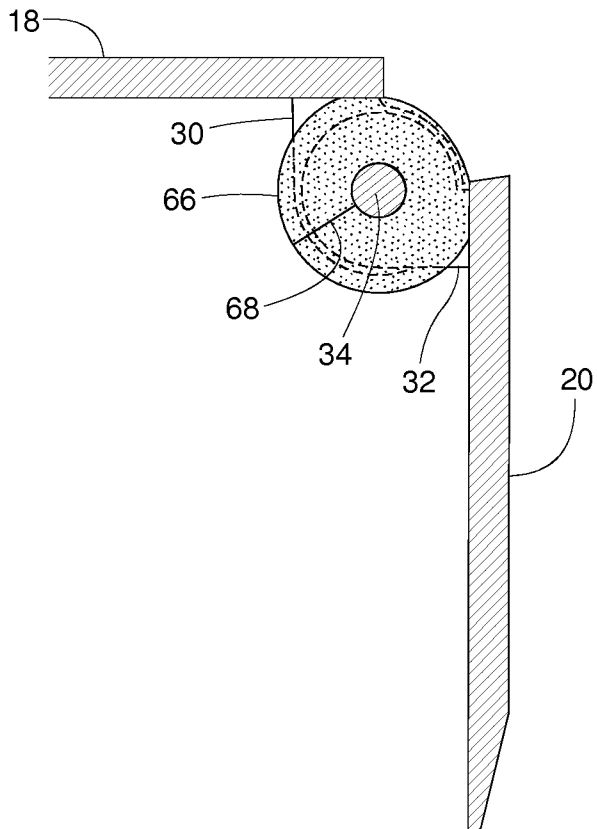
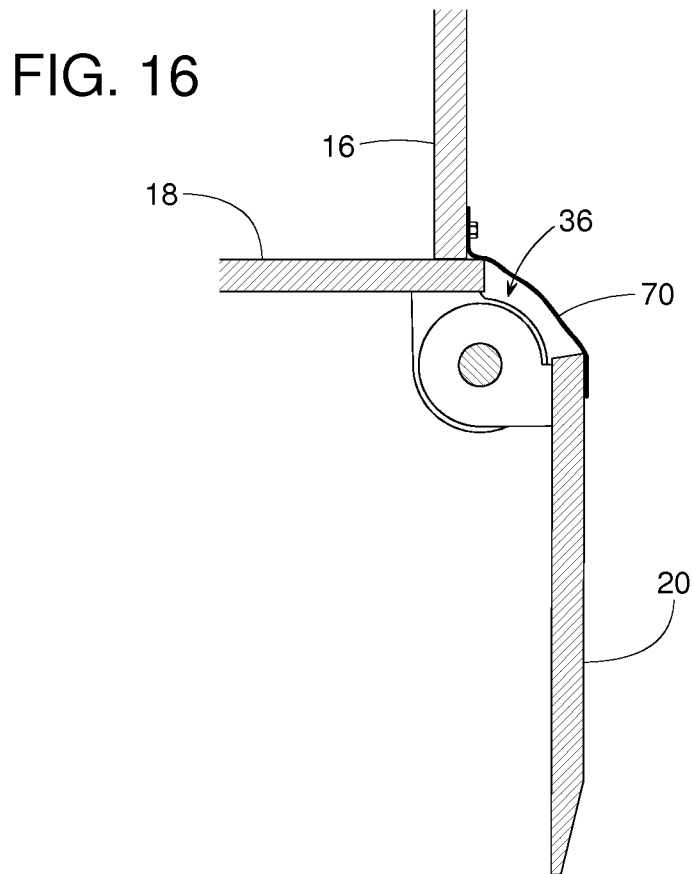
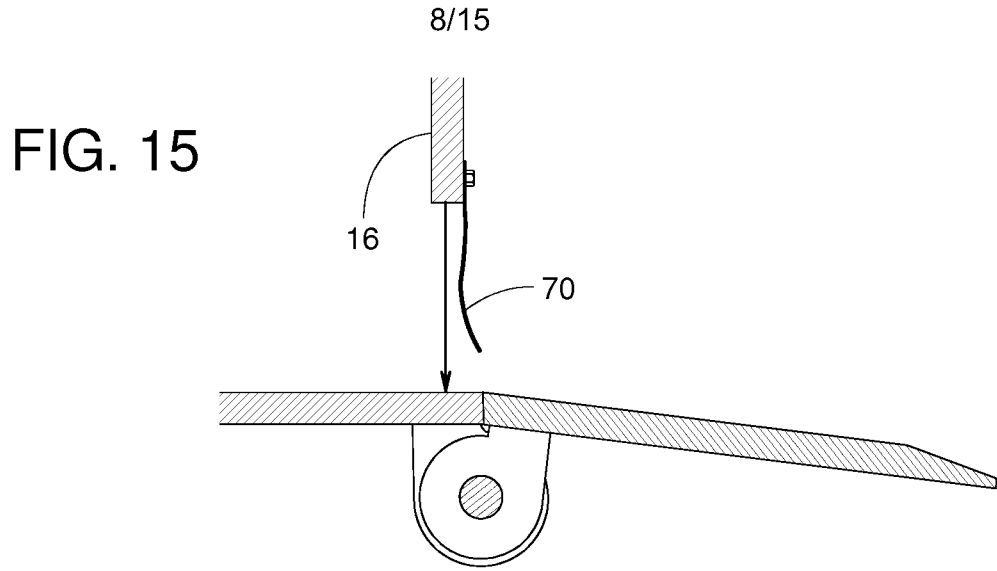


FIG. 14





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FIG. 17

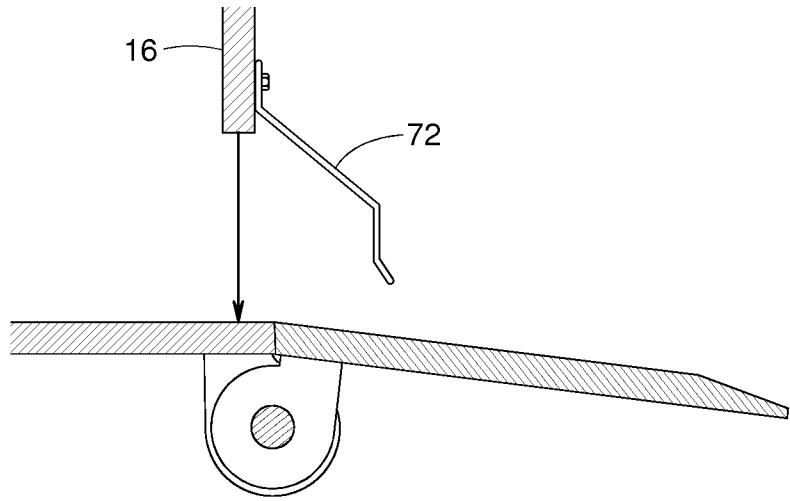
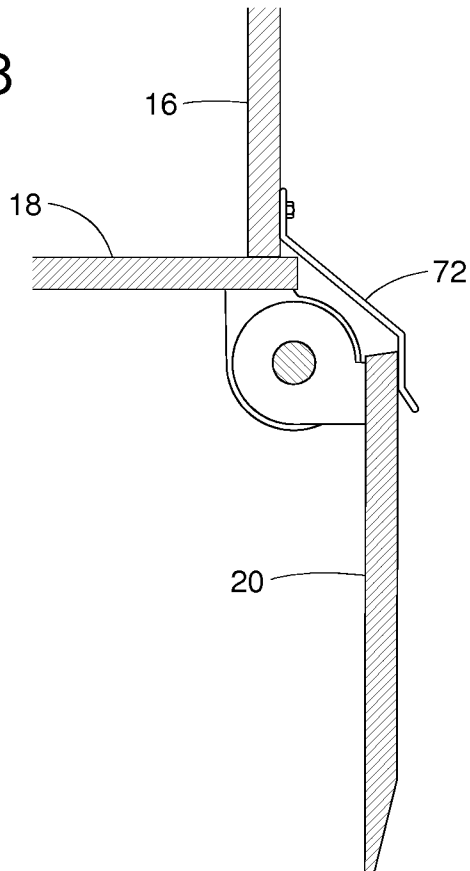


FIG. 18



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FIG. 19

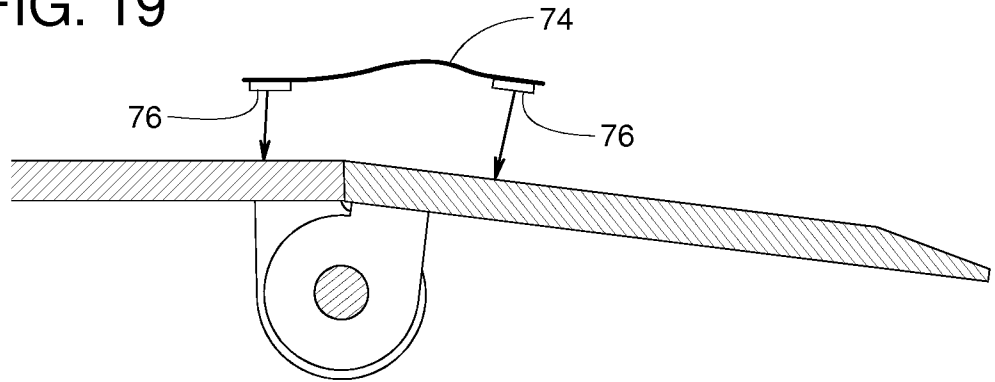
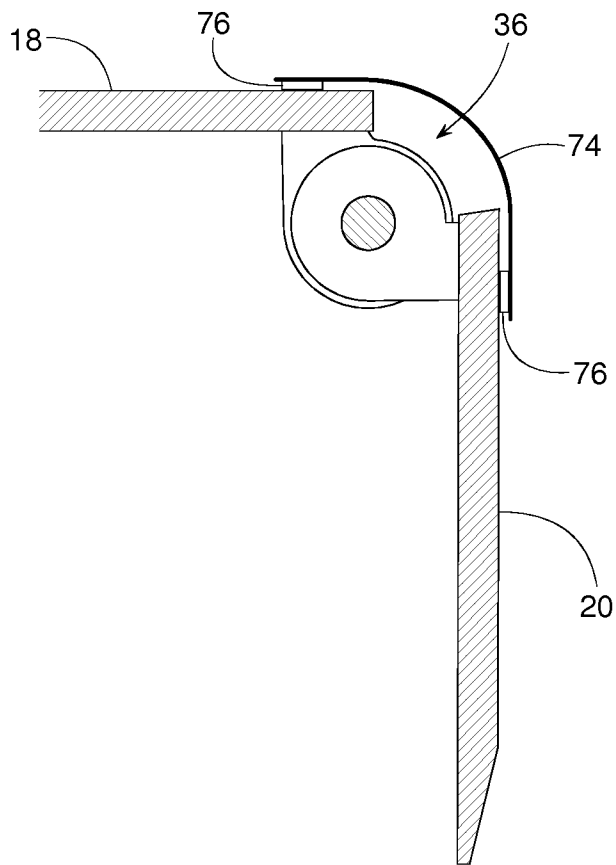


FIG. 20



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FIG. 21

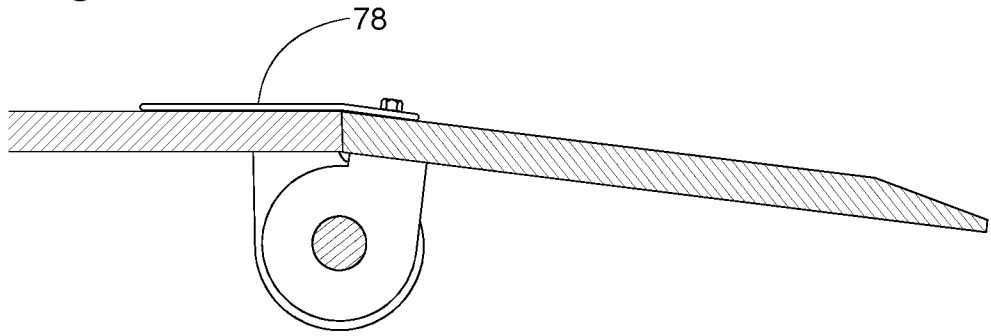


FIG. 22

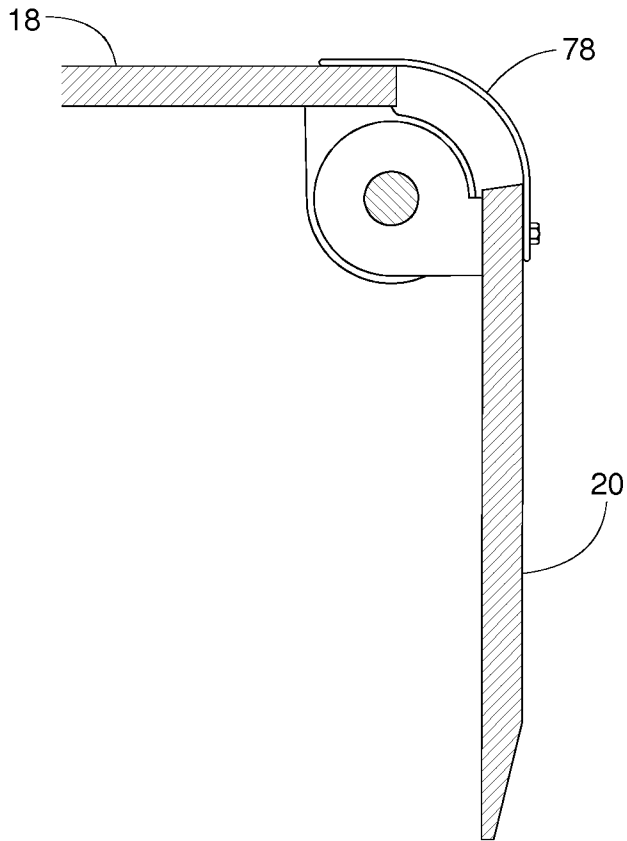


FIG. 23

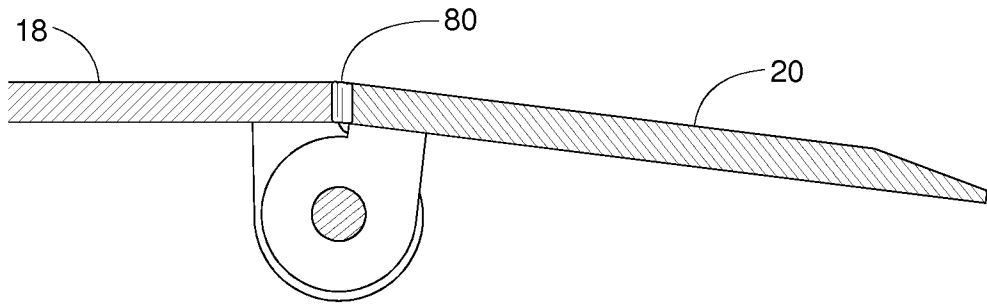


FIG. 24

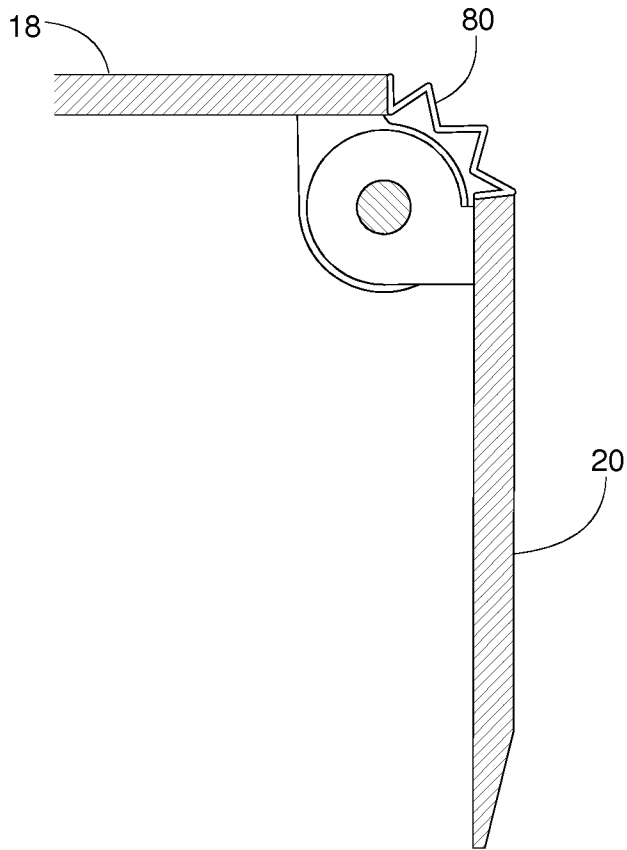


FIG. 25

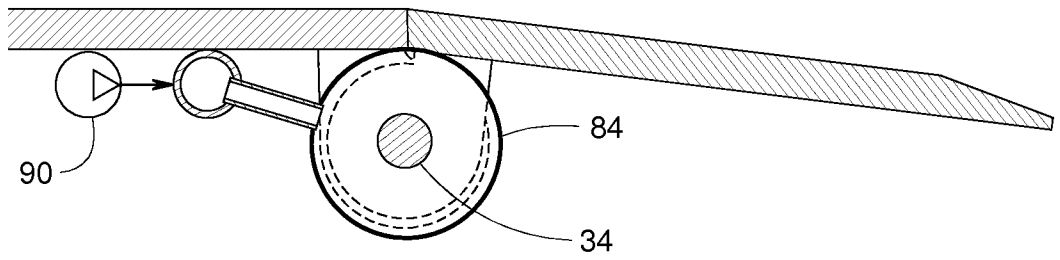


FIG. 26

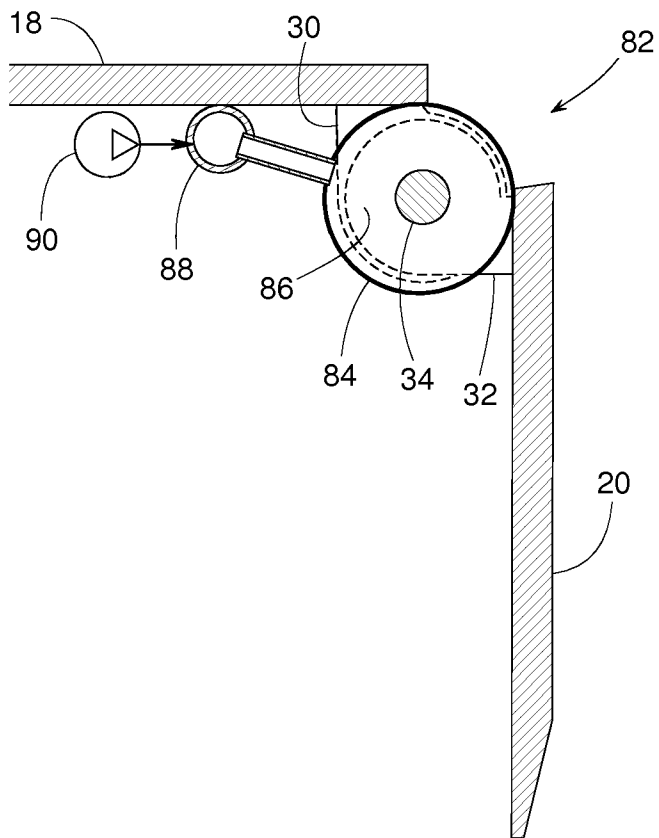


FIG. 27

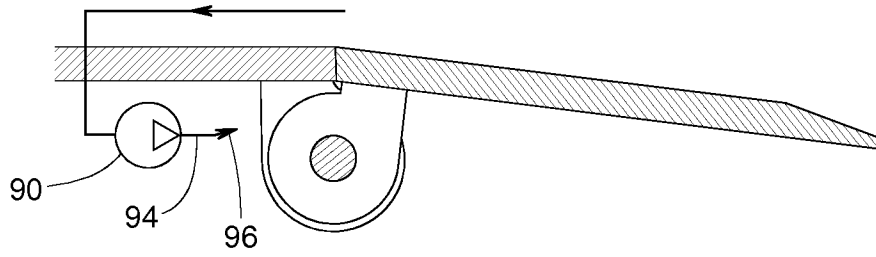


FIG. 28

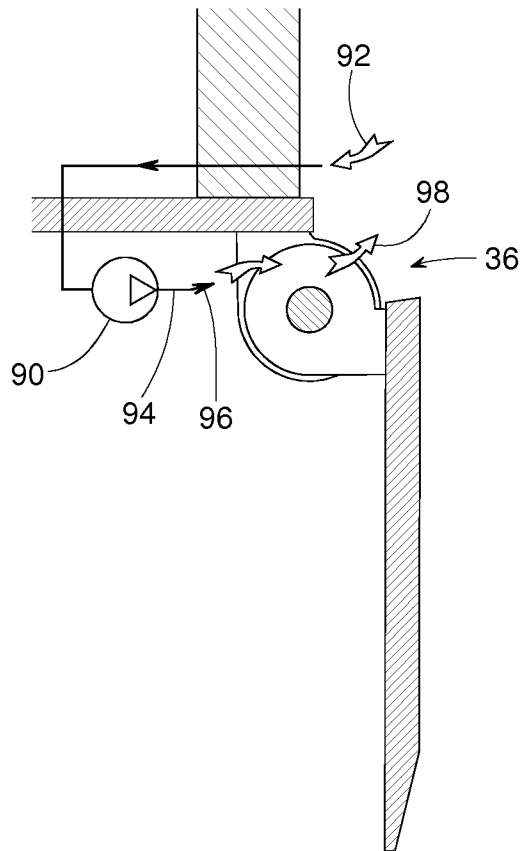


FIG. 29

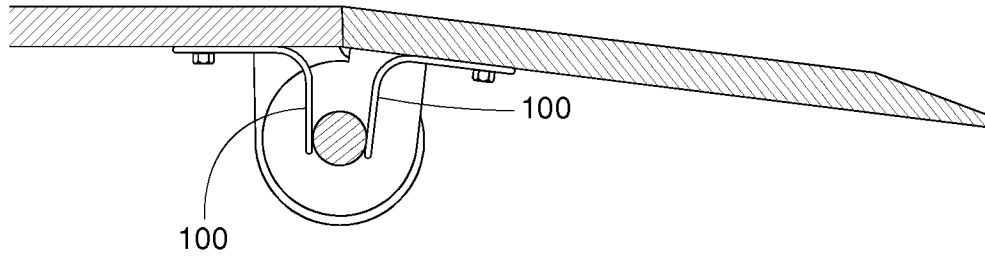
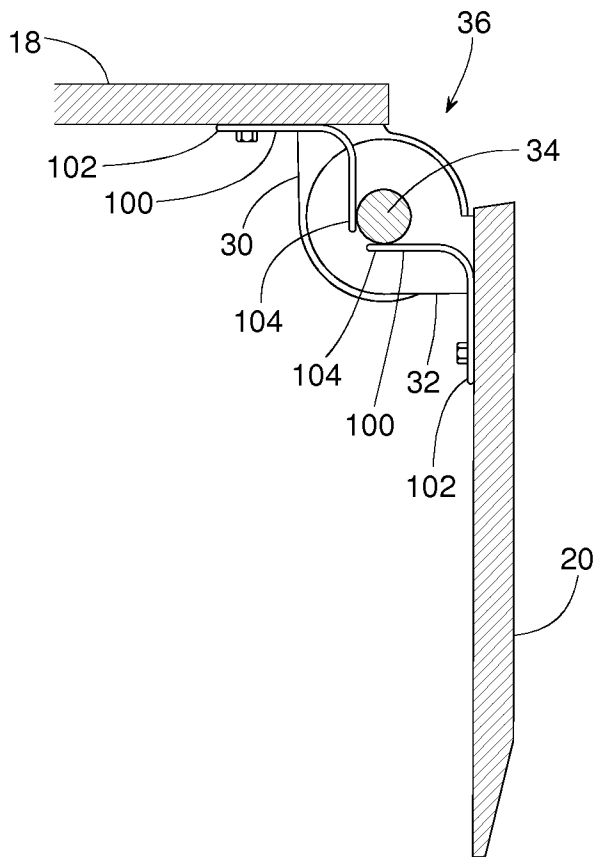


FIG. 30



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/084861

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65G69/28

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65G

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/101517 A1 (DIGMANN CHARLES J [US] ET AL) 10 May 2007 (2007-05-10)	1,2,4,12
Y	paragraphs [0071], [0075], [0103] - [0105]; figures 1-43	3,8-11, 13-16
X	US 7 146 673 B1 (DIGMANN CHARLES J [US] ET AL) 12 December 2006 (2006-12-12)	20
Y	claims 1,4,6,7; figures 19-28	21
Y	US 2004/261335 A1 (EUNGARD WILLIAM C [US]) 30 December 2004 (2004-12-30)	3,8-11, 13,15,21
	paragraphs [0027], [0032], [0036] - [0040]; figures 1-8	
A	US 4 293 969 A (FROMMELT SYLVAN J) 13 October 1981 (1981-10-13)	23
	column 2; figures 1-8	
	-/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

10 February 2009

Date of mailing of the international search report

16/02/2009

Name and mailing address of the ISA/

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Authorized officer

Martin, Benoit

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/084861

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 42 38 221 C1 (ALTEN GERAETEBAU GMBH [DE]) 24 February 1994 (1994-02-24) column 2, paragraph 10; figures 1-3 column 3, paragraphs 5,6	14
Y	US 2007/283636 A1 (BERNACKI DANIEL R [US] ET AL) 13 December 2007 (2007-12-13) paragraph [0028]; figures 1-13	16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/084861

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

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

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

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

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

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

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

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this International search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22

A seal spanning the gap between the pivotal lip and the deck of a dock leveler, and a dock leveler comprising a seal

2. claim: 23

A method for inhibiting outdoor air from passing through a gap between the pivotal lip and the deck of a dock leveler

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2008/084861

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007101517 A1	10-05-2007	CA 2626899 A1 EP 1945546 A1 WO 2007056744 A1	18-05-2007 23-07-2008 18-05-2007
US 7146673 B1	12-12-2006	CN 101304935 A US 2007101518 A1 US 2007101519 A1	12-11-2008 10-05-2007 10-05-2007
US 2004261335 A1	30-12-2004	US 2006032159 A1 US 2006026912 A1	16-02-2006 09-02-2006
US 4293969 A	13-10-1981	CA 1143404 A1	22-03-1983
DE 4238221 C1	24-02-1994	AT 133393 T DK 597405 T3 EP 0597405 A1	15-02-1996 03-06-1996 18-05-1994
US 2007283636 A1	13-12-2007	NONE	