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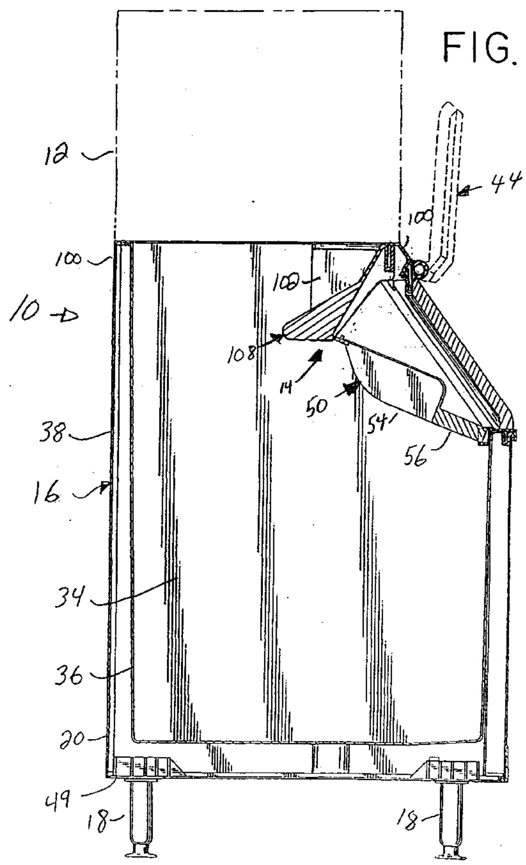
(54) Ice bin assembly

(57) An ice bin assembly (16) for use with an ice making apparatus (12). The ice bin (16) includes an ice storage cavity (34) and an ice access opening (40). A door (44) is attached to the ice bin (16) over the ice access opening (40). A pin (122) is attached to one of the ice bin (16) and the door (44). The pin (122) has a cavity (158) opening onto an outer surface thereof. A resilient material (160) is disposed within a cavity therein in order to bias a locking element (156) outward therefrom. A channel member (134) is attached to the other of the ice bin (16) and the door (44). The channel member (134) receives the pin (122) and has a first aperture (170) sized to receive the locking element (156).

FIG. 2



EP 0 874 203 A2

Description

The present invention relates generally to ice storage bins. More particularly, the present invention relates to an ice bin assembly having an improved hinge for use with the door of the ice bin. In addition, the present invention relates to an ice bin assembly having an improved ice deflector, base protection member and ice scoop holder.

There are certain disadvantages associated with the conventional manufacture of ice machines. For example, the doors on some ice machines have been problematic. The ice making apparatus and the ice bin of an ice machine have been known to have a flat front faces. A pivotable door is attached to the ice bin in order to provide access to the stored ice and a conventional hinge has been used to attach the door to the ice bin. However, depending upon the stability of the door, a user may have to hold the door open with one hand while trying to scoop out ice with the other hand. This situation is cumbersome and uncomfortable for the user.

Alternatively, the door is opened up so that it leans backward. Usually, this means that the door rests against the ice making device. However, if the ice bin is jarred while the door is leaning backward, it may fall down, hitting the hand, arm or head of a person scooping ice out of the bin.

The overall rectangular appearance of certain ice machines has also become somewhat undesirable. Presently, a more rounded appearance for an ice machine is considered by some users to be more aesthetically attractive. However, the use of a curved surface to form a portion of the ice bin and the door prevents the use of previous hinge constructions. In particular, a hinge has previously been attached across the entire top or bottom edges of the door when a rectangular or flat surface construction is employed. This construct will not work on an ice bin and door having curved surfaces.

There have also been problems associated with the proper break-up of ice in the ice bin. In many ice machines, a vertical ice-firming mold is used to form a vertical grid of interconnected ice cubes. At the conclusion of the freezing cycle, the ice machine switches to a harvest cycle wherein a hot gaseous refrigerant is admitted to the evaporator in order to thaw the front bond holding this ice sheet to the evaporator. This allows the ice sheet to fall by gravity into the ice bin. The impact of the ice sheet with the bottom of the ice bin or the stored ice is intended to break up the ice sheet into individual ice cubes. However, if the ice bin is relatively full of ice, the ice sheet will fall a shorter distance than normally expected and not break up as needed. Therefore, a user may suffer the inconvenience of having to manually break up the ice sheet. Alternatively, if a person is scooping ice out of a bin when the shelf of interconnected cubes falls, the weight of the entire sheet may hit the hand of the person scooping.

There are also certain disadvantages associated with the storage of the ice scoop in many ice machines. In particular, the ice scoop is often kept in the ice storage bin. However, if left unused for an extended period of time, the ice scoop can become buried in the most recently formed ice. Accordingly, a user may suffer the inconvenience of having to dig the ice scoop out from under the most recently formed ice.

Another problem encountered with some ice machines is the protection of the base of the ice bin. The base of an ice machine is frequently subject to bumping by users. In addition, the placement of an ice machine in a high traffic area can often result in carts or other devices coming into contact with the base. In either of these situations, this contact can lead to scratches or other damage to the ice bin which will detract from its appearance.

This invention is directed to an ice bin assembly for use with an ice making apparatus. In a first aspect of the invention, the ice bin includes an ice storage cavity and an ice access opening. A door is attached to the ice bin over the ice access opening. A pin is attached to one of the ice bin and the door. The pin has a cavity opening onto an outer surface thereof. A resilient material is disposed within the cavity in order to bias a locking element outward therefrom. A channel member is attached to the other of the ice bin and the door. The channel member receives the pin and has a first aperture sized to receive the locking element.

According to another aspect of the invention, an ice bin assembly is provided wherein the door is capable of being retained in at least two positions with respect to an ice bin. The positions include a closed position wherein the door extends over the ice access opening and a open position wherein the door is held in an open position by the hinge.

According to another aspect of the invention, an ice bin assembly is provided with a base protection member. The ice bin includes a base with the base protection member being connected thereto.

According to yet another aspect of the invention, an ice bin assembly having an ice deflector is provided. The ice deflector includes a plurality of spaced apart fins extending from an ice deflection surface. An ice bin having an ice storage cavity is positioned beneath the ice deflector.

According to a further aspect of the invention, an ice bin assembly is provided with an ice scoop support. The ice scoop support is positioned within an ice storage cavity of the ice bin.

The preferred embodiments of the present invention provide significant advantages over other ice bins. For example, in one preferred embodiment, the ice bin includes a hinge having a pin and a sleeve. The pin includes a locking element that engages an aperture within the sleeve. The door of the ice bin can then be locked into an open position while a user removes ice from the ice bin. In another embodiment, the use of an ice deflector having a plurality of fins extending from an ice deflection surface facilitates the break up of the ice sheet as it falls from the ice making apparatus. In yet another embodiment, the use of a base protection member having a plurality of resilient fingers attached to a channel within the base of the ice bin protects the base of the ice storage bin against scratches or damage. In a further embodiment, the use of an ice scoop support within the ice storage cavity of the ice bin provides support for an ice scoop above the ice being stored within the ice storage cavity.

As used herein, the term "attached" is intended to include both the direct attachment of two elements and the connection of two elements by one or more intervening elements.

The invention, together with its attendant advantages, will be best understood by reference to the following detailed description taken in conjunction with the accompanying drawings.

Figure 1 is a front perspective view of an ice bin assembly illustrating preferred embodiments of the present invention and showing the door in the open position;

Figure 2 is a sectional view of the ice bin assembly shown in Figure 1 with an ice making apparatus shown in dashed lines;

Figure 2A is an enlarged sectional view of the door area of the ice bin assembly as shown in Figures 1 and 2;

Figure 3 is a sectional view of the base of the ice bin taken along the lines 3-3 of Figure 1;

Figure 3A is an enlarged sectional view of the preferred embodiment of the base protection shown in Fig. 3;

Figure 4 is a top view of the ice bin as shown in Figures 1-3 and illustrating a first embodiment of the ice deflector;

Figure 5 is an exploded view of the ice deflector, door and hinge as shown in Figures 1-4;

Figure 6 is a perspective view of the channel member of the door and a portion of the hinge shown in Figure 5;

Figure 7 is an exploded view of a portion of the hinge shown in Figure 5;

Figure 8 is a sectional view of the hinge, the door and the channel member of Figure 5 illustrating the door in the open position;

Figure 9 is a sectional view of the hinge, the door and the channel member of Figure 5 illustrating the door in the closed position; and

Figure 10 is a sectional view of the ice bin assembly similar to that shown in Figure 2A except that another embodiment of the ice scoop support is illustrated.

Figs. 1 and 2 illustrate an ice bin assembly 10 constructed in accordance with the preferred embodiments of the present invention. Fig. 2 also illustrates an ice making apparatus 12. While the present invention may be used with a conventional ice making apparatus 12, the ice making apparatuses described in U.S. Patent Nos. 4,878,361 and 4,907,422 may also be used with the present invention. These machines may be further enhanced by improvements such as a drain valve control as taught in U.S. Patent No. 4,785,641 and a particularly advantageous pump assembly as taught in U.S. Patent No. 4,767,286. In addition, improvements for harvest pressure regulator valve systems, as taught in U.S. Patent No. 4,774,815 and an anti-blocking control as taught in U.S. Patent No. 4,550,572 may also be used.

Also, ice making apparatuses having vertical, open based freezing molds over which water is circulated from a trough or sump to build up ice, as taught in U.S. Patent No. 4,489,567, can be incorporated into an evaporator plate. In addition, the evaporator could be formed from integral extruded aluminum parts, as taught in U. S. Patent No. 5,197,357. Lastly, harvest controls, such as those taught in U.S. Patent No. 4,480,441, and a cleaning/sterilizing system as taught in U.S. Patent No. 5,408,834 may also be used. All of the U.S. patents cited above are incorporated herein by reference.

Fig. 2 illustrates a preferred embodiment of the ice deflector 14 and the ice bin 16. A plurality of feet 18 support the ice bin 16 above a base surface. The feet 18 are of conventional construction. As best seen in Figs. 1 and 3, the base 20 of the ice bin 16 includes a base protection member 26. The base protection member 26 extends around the rounded front surface 28 and the two side surfaces 30 (one shown in Fig. 1). As best seen in Fig. 2, an ice storage cavity 34 is used to store ice that has fallen from the ice making apparatus 12. An ice storage liner 36 is used to form the ice storage cavity 34. The ice bin 16 also includes a rear surface 38 as shown in Fig. 2.

As shown in Fig. 1, a rectangular ice access opening 40 provides access to the ice storage cavity 34. A door 44 is attached to the ice bin 16. The door 44 and the front surface 28 are rounded. As a result, when a user places his or her fingers in the opening 46 and lifts the door 44, the outside edges 48 are lifted away from the ice bin assembly 10. This position is illustrated in Fig. 1.

According to a preferred embodiment, the rounded front surface 28 and the two side surfaces 30 are formed from sheets of stainless steel. The rear surface 38 is formed from galvanized steel. These surfaces are affixed to the base frame 49 using double sided tape. The ice storage liner 36, as shown in Fig. 2, is preferably manufactured from a linear low density polyethylene and door 44 is preferably manufactured from a plastic material such as acrylonitrile butadiene styrene. While the door 44 is preferably blow molded, the ice storage liner 36 is preferably manufactured using a rotation molding process. In particular, a steel mold of the ice storage liner 36 is formed and a powdered linear low density polyethylene is placed in the mold. The mold is rotated within an oven having a temperature of approximately 550°. Once the linear low density polyethylene has melted, the mold is cooled and the ice storage liner is removed. The ice storage liner 36 is secured to the front surface 28, the two side surfaces 30, the rear surface 38 and the bottom surface 48 by a foamed-in-place insulation such as urethane foam.

With reference to Figs. 1 and 2A, an ice scoop 50 is shown supported within the ice storage cavity 34. The ice scoop 50 includes a scooping element 54 and a handle 56. As best seen in Fig. 2A, the ice scoop 50 is positioned on a first support member 60 and a second support member 62. The first support member 60 has a downwardly and inwardly projecting surface 64 and an outwardly projecting shelf 66. An upstanding ridge 68 extends from a central portion of the shelf 66 and longitudinally therealong. The upper lip 70 of the scooping element 54 is supported on the shelf 66 directly adjacent the ridge 68. The second support member 62 includes a horizontally extending wall 70 and two side walls 72 that form a pocket in order to support the handle 56.

According to a preferred embodiment, the first support member 60 is ultrasonicly welded to the ice deflector 12 and is formed from a high density structural polyethylene foam such as Soltex t60-500. The second support member 62 is formed from a flexible vinyl (90 durometer) that is also used to form a trim 74 around the perimeter of the ice access opening 40. The ice scoop 50 is of conventional design.

Figs. 3 and 3A best illustrates a preferred embodiment of the base protection member 26. The base 20 of the ice bin 16 includes a channel 80 extending adjacent the front surface 28 and the side surfaces 30. The channel 80 opens downward toward a base surface and includes a top wall 82 and side walls 84. As best shown in Fig. 3A, a plurality of semi-flexible fingers 86 are formed in an upstanding portion 88 of the base protection member 26. The fingers 86 are sized to securely engage the channel 80. A cover portion 90 extends upward adjacent the front surface 28. The cover portion 90 includes an upper lip 92 that extends toward and contacts the front surface 28 of the ice bin 16. A piece of double sided tape 94 is used to connect the rear surface 96 of the base protection member 26 to the front surface 28.

According to a preferred embodiment, the cover portion 90 extends upward approximately three inches with the length of the base protection member 26 adjusted to fit around the perimeter of the front surface 28 and the side surfaces 30. The base protection member 26 is preferably formed from a flexible vinyl material (90 durometer).

Figs. 2, 2A and 4-5 best illustrate a preferred embodiment of the ice deflector 14. The ice deflector 14 is attached to a top portion 100 of the ice bin 16 and includes a first side wall 102, a second side wall 103 and a top surface 104. Conventional fastening elements, such as screws (not shown), pass through apertures 106 in order to affix the ice deflector 14 to the ice bin 16. As best seen in Figs. 2A, and 4, fins 108 extend inward from the ice deflecting surface 110. The particular size and configuration of the ice deflector 14 should be modified to suit the size of the associated ice making apparatus and ice bin. As an example, in an ice making machine having a length of 22", five firis 108 may be used, as shown in Fig. 5. The first fin is spaced approximately 3.75" from the first side wall 102 with the remaining fins being spaced apart approximately 2.75". While five fins are used in this embodiment, the particular number of fins could be modified as needed. For example, seven fins could be used with ice deflector having a length of 30". In addition, thirteen fins could be used with an ice deflector having a length of 48".

With reference to Fig. 2A, each fin 108 includes a downwardly projecting surface 114, a curved tip 116 and a substantially horizontally extending bottom surface 118. According to a preferred embodiment, the downwardly projecting surface 114 has length of approximately 7.5" and the bottom surface 118 has a length of approximately 4" with an angle of 150° existing between the ice deflecting surface 110 and the downwardly projecting surface 114.

While the ice deflector 14 may be constructed from a wide variety of conventional materials known to those of ordinary skill in the art, the preferred embodiment is constructed using an injection molding process with a blowing agent suitable for food applications, such as Endex NBC50® manufactured by Endex Polymer Additives, Inc. of Aurora, Illinois. A high density structural polyethylene foam, such as Soltex t60-500 is the preferred material used to form the ice deflector 14.

The connection of the door 44 to the ice storage bin 16 is best illustrated in Figs. 5-9. A hinge 120 is used to connect the door 44 to the ice deflector 14 and the ice bin 16. The hinge 120 includes pins 122 that are fixedly mounted to a channel 124 within the upper portion 126 of the door 44. More specifically, the rear portions 128 of the pins 122 are fixedly attached to the collar 130, which is fixedly secured to the channel 124. In operation, the pins 122 are rotatable with respect to the channel member 134 of the ice deflector 14. In the preferred embodiment, the pins 122 are rotatable within a sleeve 136 mounted within the channel member 134. The channel member 134 and the ice deflector 14 are monolithic in this preferred embodiment. The channel member 134 projects outwardly via support wall 140 and the brackets 144. The channel member 134 includes two slots 146 (one shown) that extend across a central portion thereof. While the channel member 134 is attached to the ice deflector 14 in the preferred embodiment illustrated, it could also be directly attached to the ice bin 16 or otherwise attached.

The pins 122 are fixedly attached to collar 130 within the channel 124 of the door 44. As best seen in Figs. 8 and 9, the pins 122 include a keyway 148 that extends along the length thereof and mates with an upstanding ridge 150 within the collar 130. The keyway 148 and ridge 150 prevent the pins 122 from rotating with respect to the channel 124 and the door 44. The pins 122 include the locking elements which take the form of the balls 156 in the preferred embodiment. The balls 156 are captured within the cavities 158. A non-metallic resilient material, such as the rubber pad 160, is positioned behind each of the balls 156 in order to bias them outward past the outer surface 164. As shown in Figs. 8 and 9, the balls 156 are biased out from the cavities 158. However, the balls 156 can be pressed inward and positioned completely within the cavities 158 by being depressed against the rubber pads 160. In the preferred embodiment illustrated in the figures, the pins 122 include three balls 156 captured within three discrete cavities 158 and biased by three discrete rubber pads 160.

The pins 122 fit within the sleeves (one of two shown) 136 that are captured within the channel member 134. The sleeves 136 include two sets of three apertures 170 (one shown). The second set of apertures is circumferentially spaced from the first of the apertures with each set of apertures 170 being sized and spaced to conform with the spacing of the three balls 156. As shown in Fig. 6, the sleeves 136 also include a keyway 174 that is sized to mate with a ridge 176 extending within the channel member 136. The keyway 174 has a generally U-shaped form with two notches 175 (one shown) at opposite ends thereof. The generally L-shaped ridge 176 prevents a sleeve 136 from moving within the channel member 136. In addition, the ridge 176 prevents the sleeves 136 from being pushed out an end of the channel member 134. Furthermore, the configuration of the notches 175 prevents the sleeve 136 from being inadvertently positioned within the channel member 134 in the wrong configuration. In particular, if the sleeve 136 was rotated 180 degrees in a horizontal plane, the other notch 175 would not properly align with the ridge 176. Accordingly, sleeve 136 would not fit within the channel member as shown in Fig. 6 and the assembly person could reinsert the sleeve 136 using the proper orientation.

Fig. 8 illustrates the relationship of pin 122 and sleeve 136 when the door 44 is in the open position. The balls 156 are biased by the rubber pad 160 into the apertures 170. The balls 156 are biased within the apertures by a force sufficient to retain the pin 122 in a fixed position with respect to the sleeve 136 thereby maintaining the door 44 in the open position illustrated. The door 44 is placed in the closed position, as illustrated in Fig. 9, when a user pushes down on the door 44. The balls 156 are then depressed into the rubber pads 160 as the pins 122 rotate with the movement of the door 44. At the closed position, the balls 156 are again biased into the second set of apertures 170 within the sleeve 136. The second set of apertures prevents the resiliency of rubber pads 160 from being adversely affected by an extended period of inward pressure on the pads that would occur otherwise.

The hinge 120 is assembled by inserting the sleeves 136 through one of the slots 146 into the channel member 134. The keyway 174 and ridge 176 cooperate to fix the sleeve 136 with respect to an end of channel member 134. The pins 122 are also inserted through one of the slots 146 with rear portion 128 being pushed into within the collar 130 of the channel 124 in the door 44. The keyway 148 and ridge 150 prevent the pins 122 from rotating with respect to the channel 124 and the door 44. The collars 130 are preferably molded within the channel 124 of the door 44 during its formation. Accordingly, the pins 122 can rotate with respect to the sleeves 136 as the door 44 is opened and closed. In order to remove the door 44, a user would apply a lateral force to the pins 122 by extending a finger from the slot 146 into the channel member 134. The pins 122 will then slide out from the channel member 134 and completely enter the channel 124 of the door 44. Accordingly, the door 44 could then be removed from attachment to the ice bin 16.

According to the preferred embodiment, the pins 122 are formed from a cold drawn zinc plated steel, #1215. The balls 156 are formed from hardened steel within a range of 58-60 Rockwell c scale and have a diameter of .313". The rubber pads 160 are preferably formed from a buna-n 210 rubber. The sleeve 136 is preferably formed from a cold rolled steel hardened within the range of 45-50 on a Rockwell c scale.

Fig. 10 illustrates an alternate and preferred embodiment of the ice scoop support member. The ice scoop member is essentially the same as that discussed with respect to Fig. 2A, except that the first support member 200 includes a retaining surface 202 above the shelf 204. The retaining surface 202 includes a first portion 206 that extends substantially in parallel with the shelf 204 and an upwardly projecting portion 208. The combination of the shelf 204 and the retaining surface 202 act to trap the upper lip 210 of the ice scoop 212 therebetween. This configuration helps prevent the ice scoop 212 from falling into the associated ice bin. The second support member 214 includes a horizontally extending wall 216 and two side walls 218 that form a pocket to support the handle 220.

The present invention may be embodied in other specific forms without departing from the spirit of the invention. For example, the number of fins on the ice deflector or locking elements on the pins may be varied. In addition, conventional materials in addition to those described herein could be used to construct the present invention. Therefore, it is intended that the foregoing detailed description be regarded as illustrative rather than limiting, and it is understood that the appended claims, including all equivalents, are intended to define the scope of the invention.

Claims

1. An ice bin assembly for use with an ice making apparatus comprising:

   a) an ice bin having an ice storage cavity and an ice access opening providing access to the ice storage cavity;
   b) a door attached over the ice access opening;
   c) a pin attached to one of the ice bin and the door, the pin having a cavity opening to an outer surface thereof, a resilient material and a locking element being disposed within the cavity, the resilient material biasing the locking element outward from the cavity; and
   d) a channel member attached to the other of the ice bin and the door, the channel member receiving the pin and having a first aperture sized to receive the locking element whereby upon rotation of the pin with respect to the channel member, the locking element will engage the aperture within the channel member and thereby retain the door in an open position.

2. The ice bin assembly of claim 1 wherein the pin is connected to the door and the channel member is connected to the ice bin.

3. The ice bin assembly of claim 2 wherein the channel member comprises a sleeve.

4. The ice bin assembly of claim 3 wherein the resilient material comprises rubber.

5. The ice bin assembly of claim 4 wherein the locking element is a steel ball.

6. The ice bin assembly of claim 2 wherein the door includes a top edge, the top edge being pivotably connected to the ice bin.

7. The ice bin assembly of claim 6 wherein the door includes a front surface and the ice bin includes a front surface, the front surfaces of the door and the ice bin being curved.

8. The ice bin assembly of claim 1 further comprising a base protection member connected to a base of the ice bin.

9. The ice bin assembly of claim 8 wherein the base protection member includes a connector that is received within an aperture in the base of the ice bin.

10. The ice bin assembly of claim 9 the aperture comprises a channel extending adjacent to and in parallel with an outer surface of the ice bin.

11. The ice bin assembly of claim 10 wherein the connector comprises a plurality of flexible fingers sized to engage the channel.

12. The ice bin assembly of claim 11 wherein the channel opens downwardly toward a base surface.

13. The ice bin assembly of claim 12 wherein the base protection member extends outward from beneath the channel and upward adjacent the outer surface of the ice bin.

14. The ice bin assembly of claim 13 wherein the base protection member comprises a top portion having an inwardly curving lip that contacts the outer surface of the ice bin.

15. The ice bin assembly of claim 14 further comprising a piece of double sided tape positioned between the top portion of the base protection member and the outer surface of the ice bin.

16. The ice bin assembly of claim 1 further comprising an ice deflector positioned between the ice making apparatus and the ice bin.

17. The ice bin assembly of claim 16 wherein the ice deflector includes a plurality of laterally spaced and inwardly projecting fins.

18. The ice bin assembly of claim 17 wherein the fins have a generally triangular shape.

19. The ice bin assembly of claim 18 wherein the ice deflector includes at least five fins.

20. The ice bin assembly of claim 19 wherein the ice deflector is injection molded from a high density plastic foam.

21. The ice bin assembly of claim 20 wherein the channel member receiving the pin is connected to the ice deflector.

22. The ice bin assembly of claim 21 wherein the channel member is centrally connected to the ice deflector.

23. The ice bin assembly of claim 1 further comprising an ice scoop support positioned within the ice storage cavity.

24. The ice bin assembly of claim 23 wherein the ice scoop support includes a downwardly angled first surface adjacent the ice access opening.

25. The ice bin assembly of claim 24 wherein the downwardly angled first surface includes a substantially

upwardly extending ridge.

26. The ice bin assembly of claim 24 wherein the downwardly angled first surface is connected to an ice deflector.

27. The ice bin assembly of claim 26 wherein the ice scoop support further includes a second surface extending into the ice storage cavity from a position beneath the ice access opening.

28. The ice bin assembly of claim 27 wherein the second surface extends substantially horizontally.

29. The ice bin assembly of claim 28 wherein the second surface extends adjacent a pair of spaced and vertically extending side walls.

30. The ice bin assembly of claim 29 further comprising an ice scoop having a scoop and a handle wherein a top portion of the scoop rests on the first surface and the a portion of the handle rests on the second surface.

31. The ice bin assembly of claim 30 wherein a third surface extends above and substantially in parallel with the first surface, the top portion of the scoop being secured between the first and third surfaces.

32. An ice bin assembly for use with an ice making apparatus comprising:

a) an ice bin having an ice storage cavity and an ice access opening allowing access to the ice storage cavity; and
b) a door attached by a hinge to the ice bin adjacent the ice access opening, the door being capable of being retained in at least two positions with respect to the ice bin, the positions including a closed position wherein the door extends over the ice access opening and a open position wherein the door is held in an open position only by the hinge.

33. The ice bin assembly of claim 32 wherein the hinge is connected to the door and the bin at a position spaced apart from an outer edge of the door and the bin.

34. The ice bin assembly of claim 33 wherein the hinge comprises a pin connected to the door and a channel member connected to the ice bin.

35. The ice bin assembly of claim 34 wherein the pin includes a first internal cavity opening to an outer surface thereof, a resilient material and a first locking element disposed within the first internal cavity.

36. The ice bin assembly of claim 35 wherein the channel member comprises a sleeve having a first aperture.

37. The ice bin assembly of claim 36 wherein the pin further comprises second and third internal cavities opening to an outer surface of the pin, each cavity having a resilient material and a locking element disposed therein.

38. The ice bin assembly of claim 37 wherein the sleeve further comprises second and third apertures.

39. The ice bin assembly of claim 38 wherein the sleeve further comprises fourth, fifth and sixth apertures being circumferentially spaced from the first, second and third apertures.

40. The ice bin assembly of claim 39 wherein the pin includes a longitudinally extending channel that mates with a ridge attached to the door.

41. The ice bin assembly of claim 40 wherein the sleeve includes a keyway that mates with a notch attached to the ice bin.

42. The ice bin assembly of claim 41 wherein the door includes a top edge, the top edge being pivotably connected to the ice bin.

43. The ice bin assembly of claim 42 wherein the door includes a front surface and the ice bin includes a front surface, the front surfaces of the door and the ice bin being curved.

44. An ice bin assembly for use with an ice making apparatus comprising:

a) an ice bin having an ice storage cavity and an ice access opening allowing access to the ice storage cavity, the ice bin having a curved front surface; and
b) a door attached by a hinge to the ice bin adjacent the ice access opening, the curvature of the door substantially corresponds to a curvature of the front surface of the ice bin.

45. The ice bin assembly of claim 44 wherein the hinge is connected to a top edge of the ice access opening and a top edge of the door.

46. The ice bin assembly of claim 45 wherein the hinge is connected to only a center portion of the top edge of the ice access opening and to only a center portion of the top edge of the door.

47. The ice bin assembly of claim 46 further comprising a handle formed in a central portion of a bottom edge of the door.

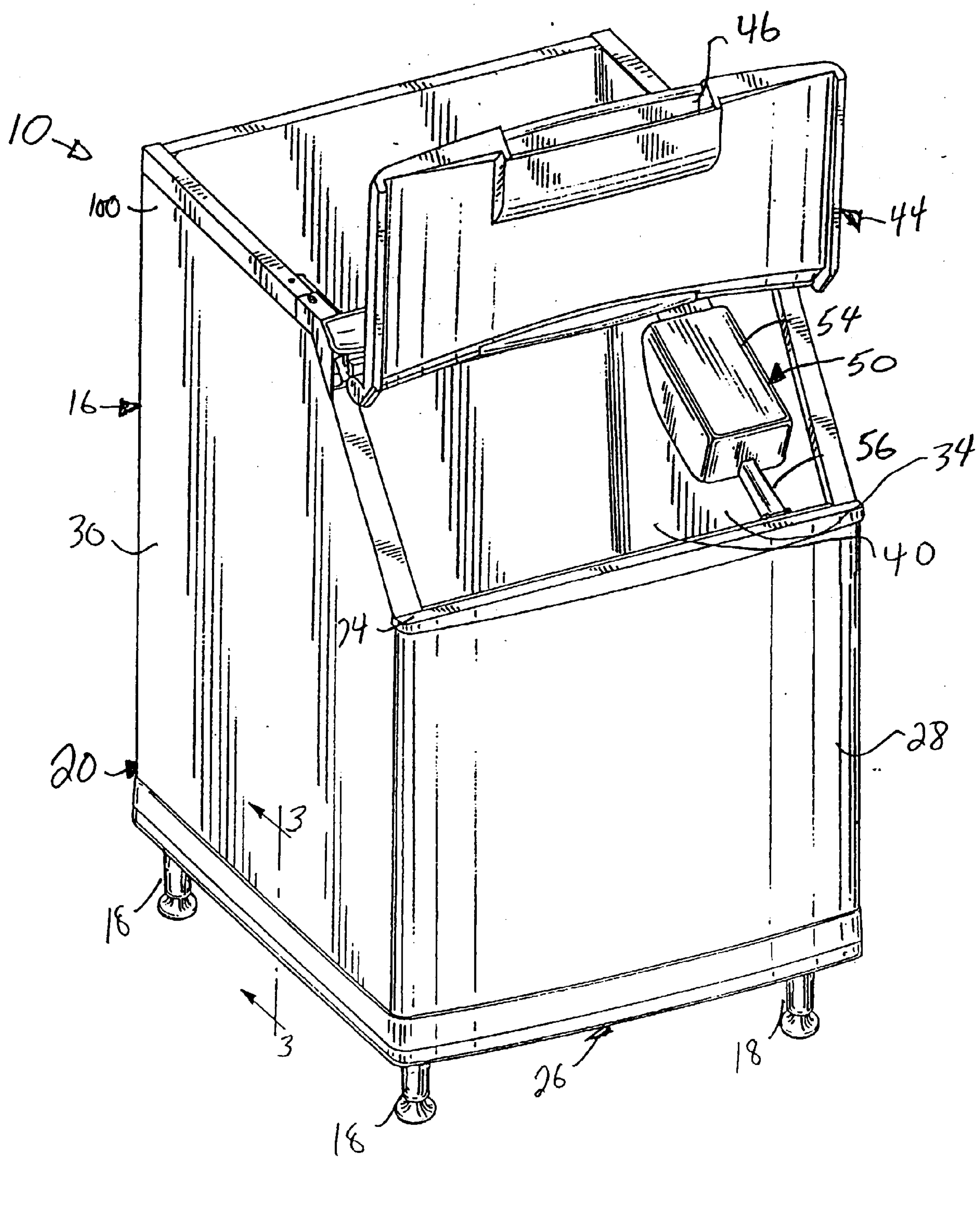
48. The ice bin assembly of claim 47 wherein the door is capable of being retained by the hinge in an open position in which first and second outer edges of the top portion of the door are spaced apart from the ice access opening.

49. The ice bin assembly of claim 48 wherein the hinge includes a pin mounted to a first channel formed within the top edge of the door.

50. The ice bin assembly of claim 49 wherein the pin is received within a second channel connected to the ice bin.

51. The ice bin assembly of claim 49 wherein the pin includes a detent.

FIG. 1



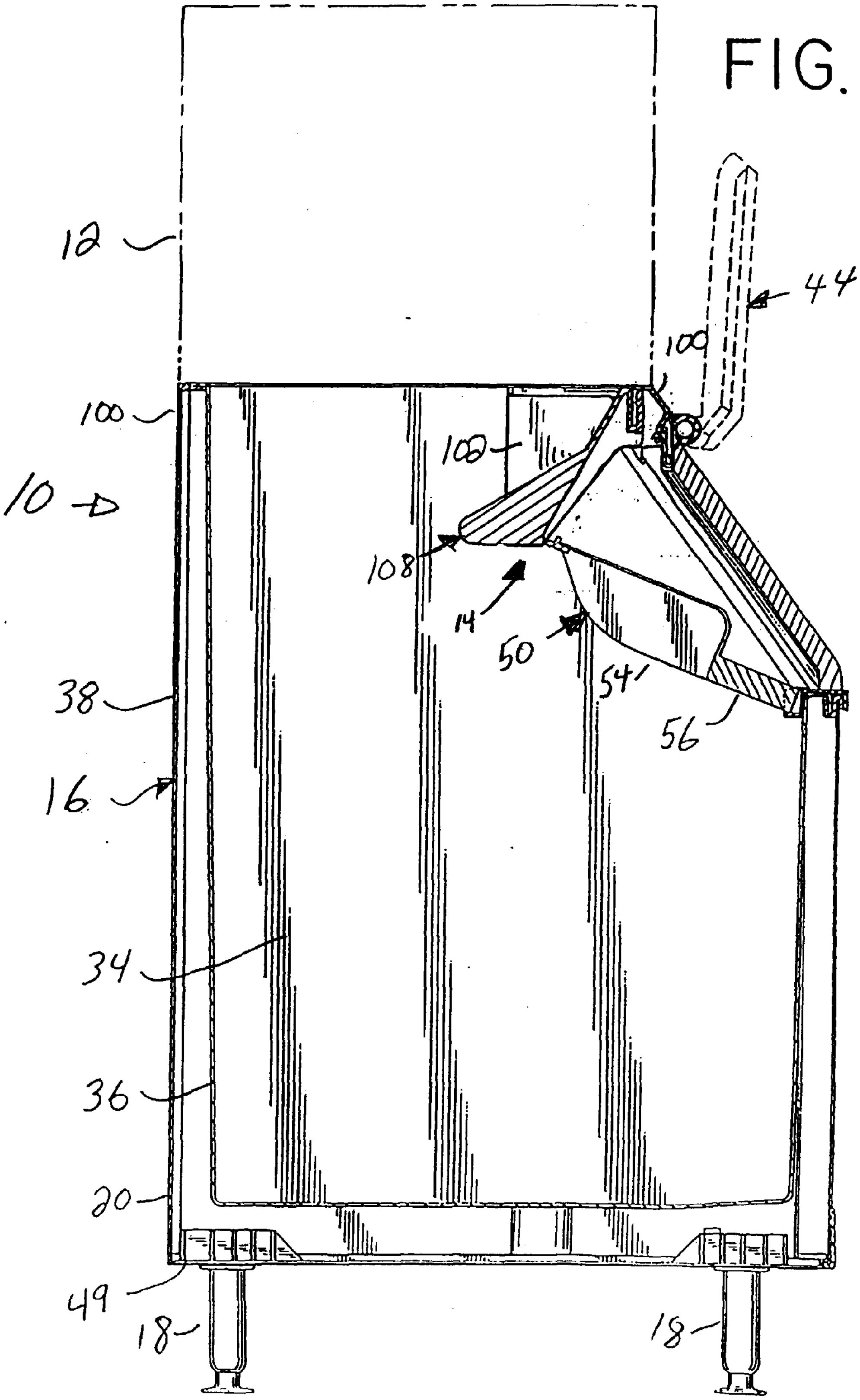
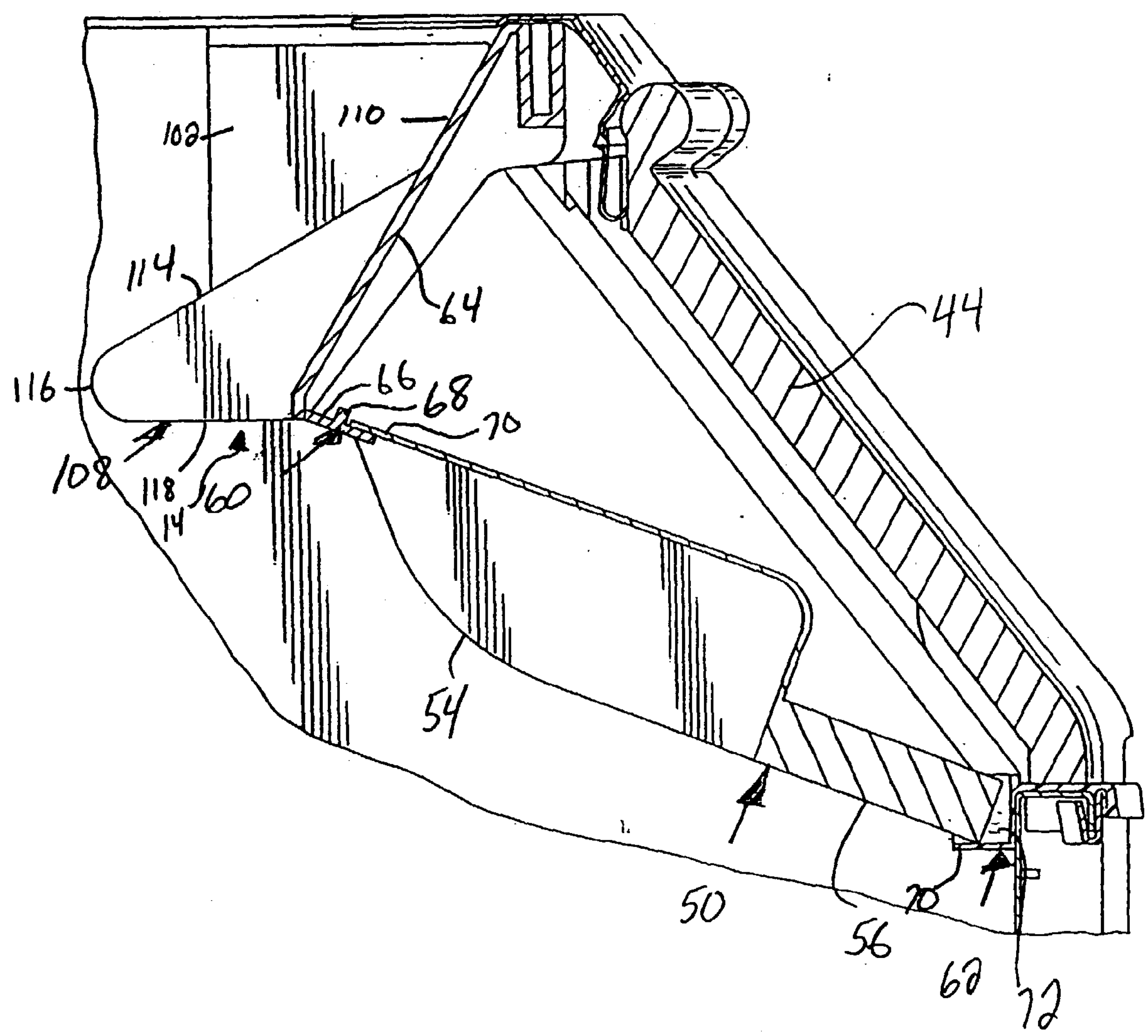


FIG. 2

FIG.2A



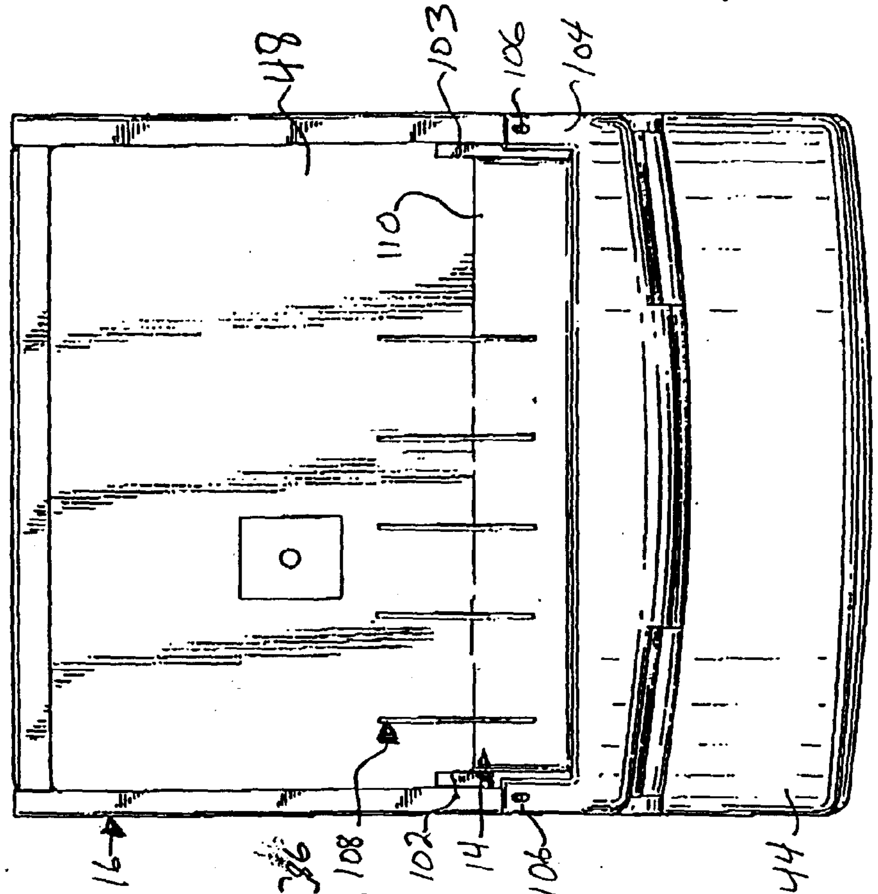


FIG. 4

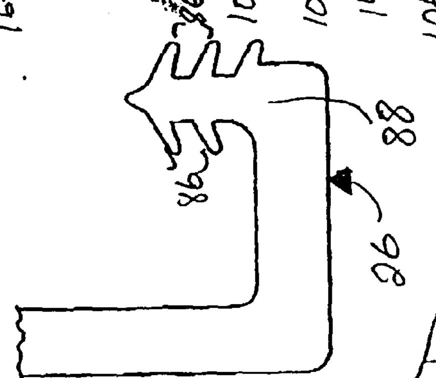


FIG. 3A

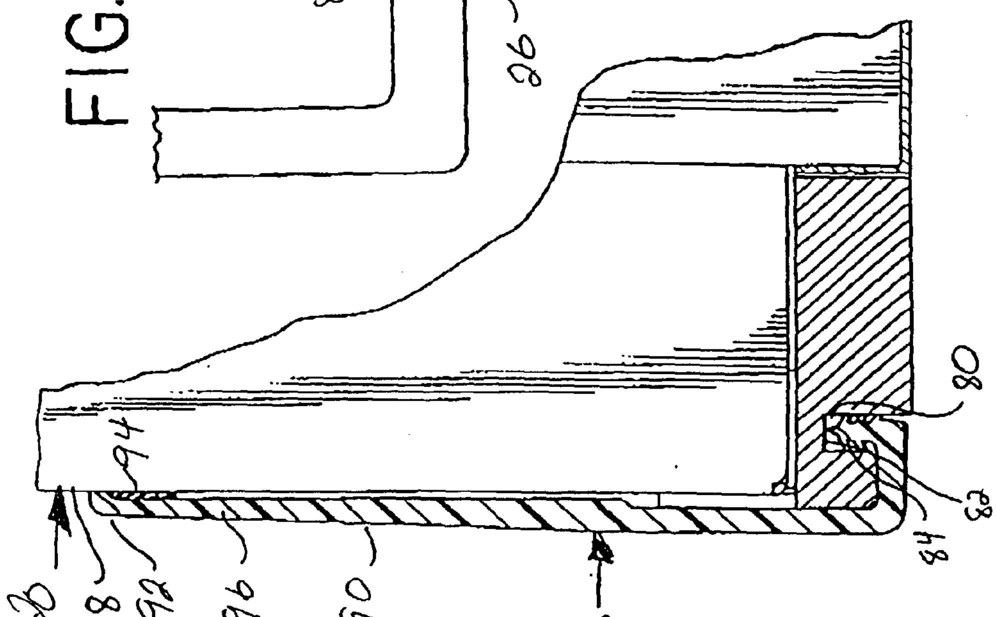
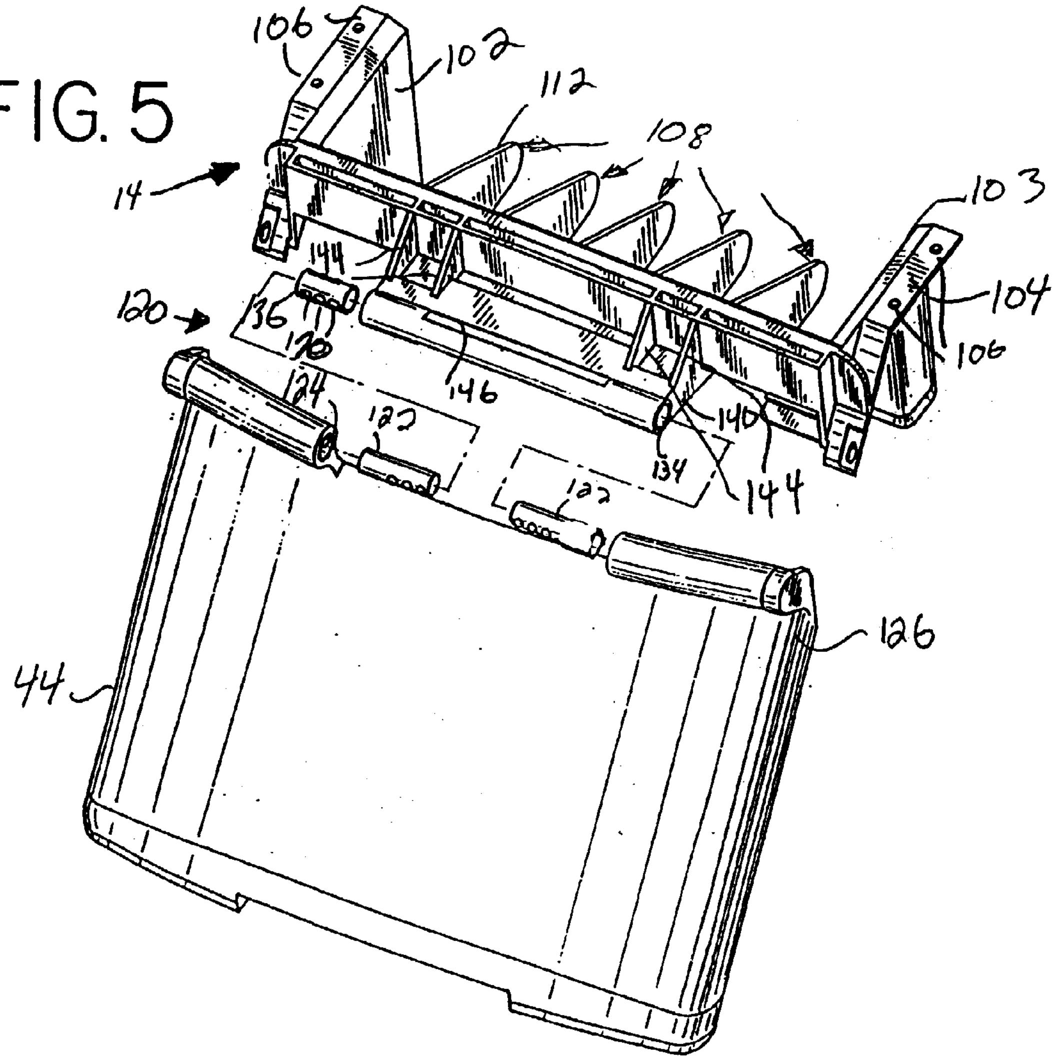


FIG. 3

FIG. 5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102
112
108
14
103
104
106
144
120
136
170
146
124
122
140
134
144
122
126
44

FIG. 6

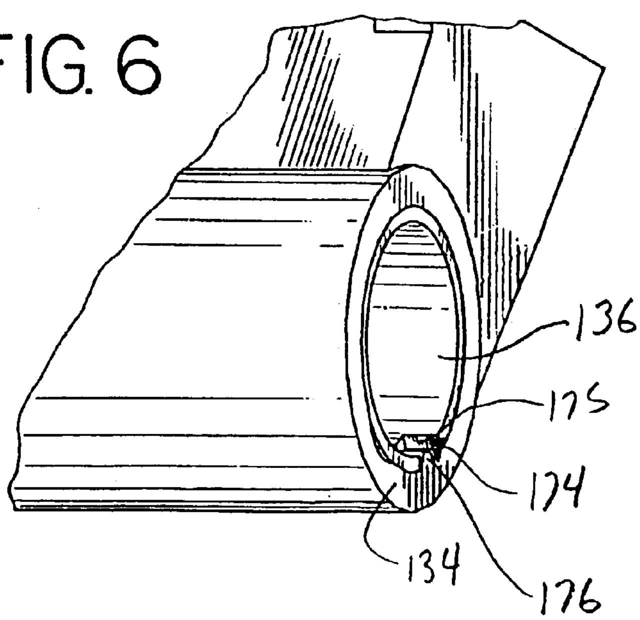

136
175
174
134
176

FIG. 7

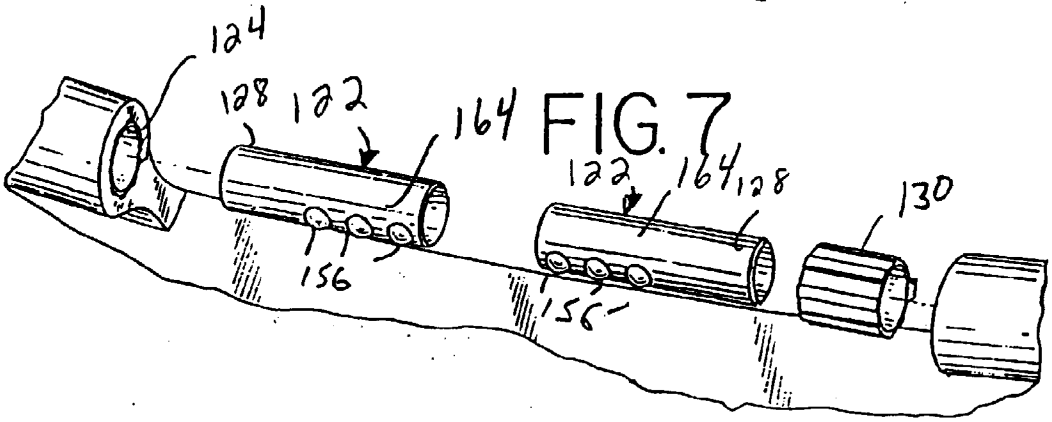


FIG. 8

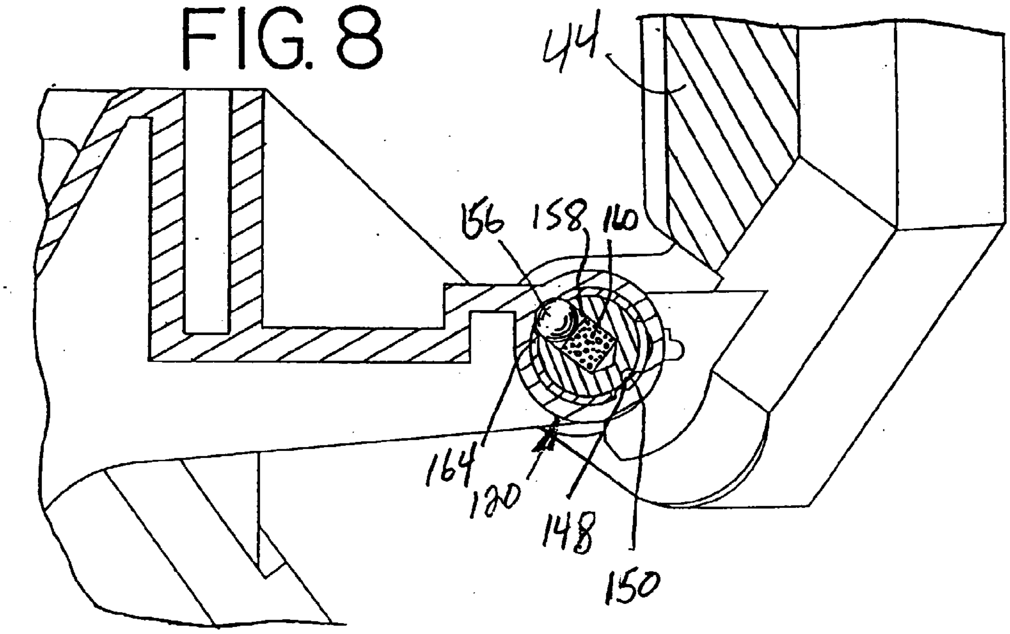
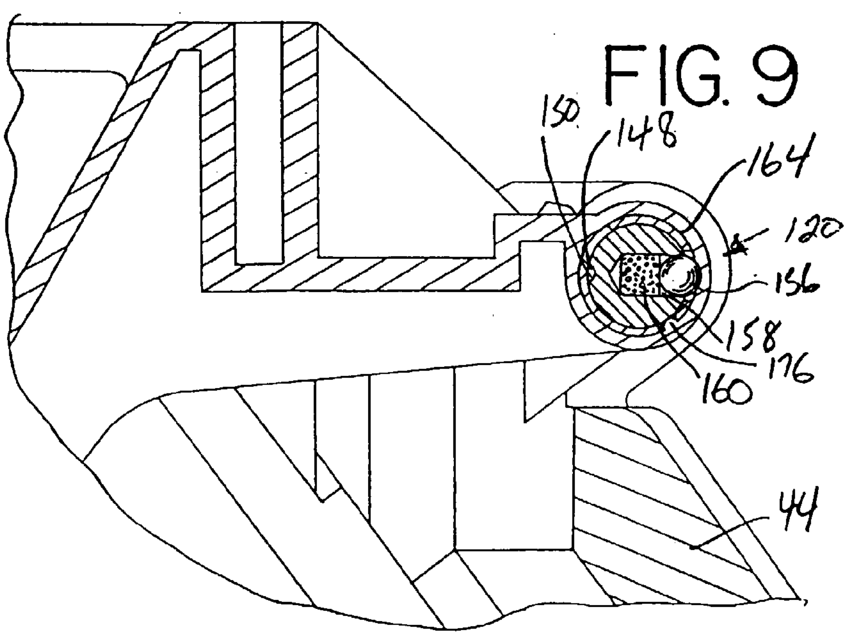


FIG. 9



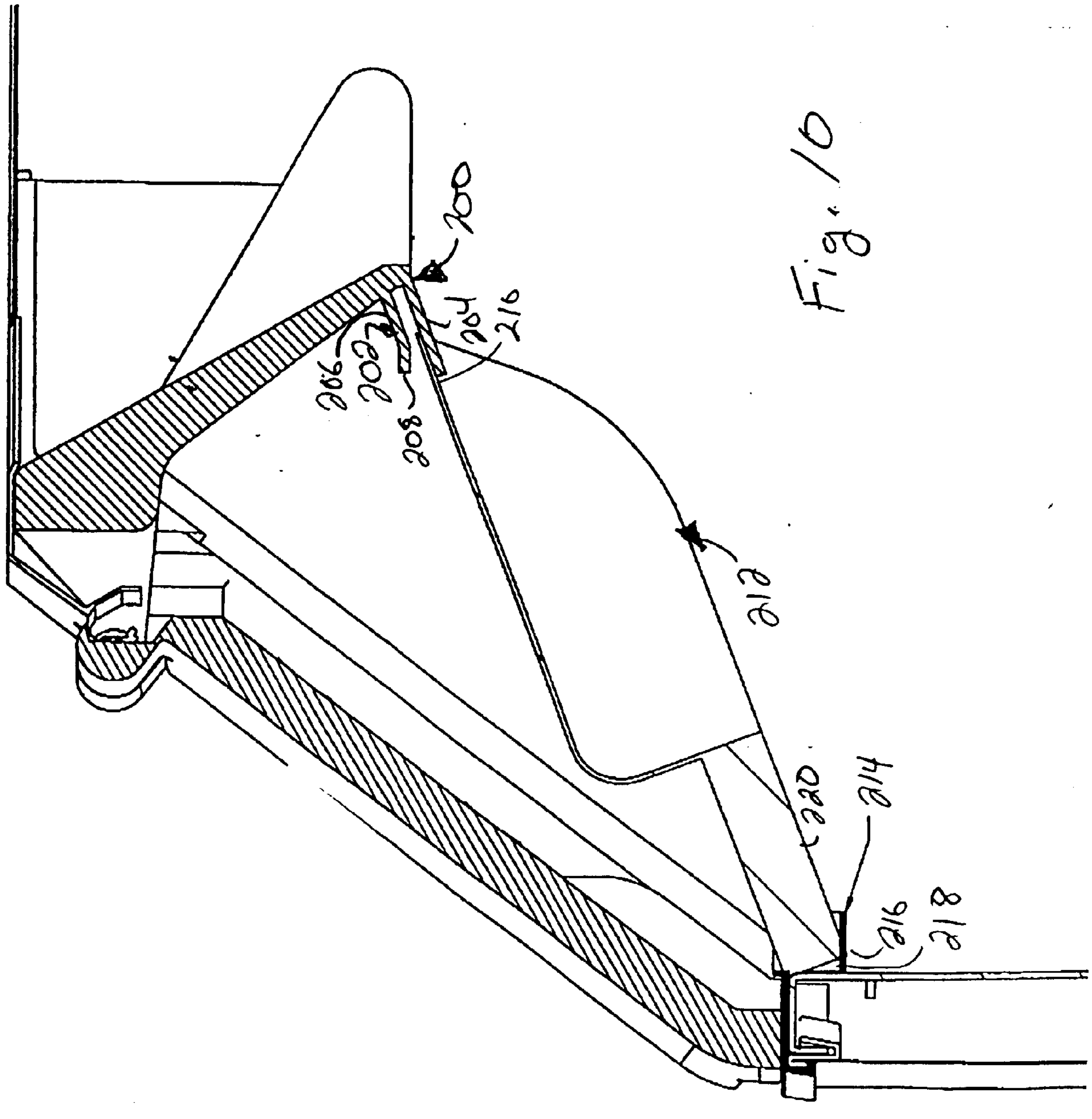


Fig. 10